

Researching Chinese Medicine's Explanatory Models

Do ancient medical notions have a place in a modern world?

Abstract

By: Charles
Buck

Keywords:
Traditional
acupuncture,
Chinese
medicine,
theory,
explanatory
models,
research,
scientific
appraisal.

Many clinical studies have evaluated the efficacy of acupuncture and Chinese herbal medicine, and numerous research papers have been published on their physiological and pharmacological mechanisms. However, critical appraisal of Chinese medicine's explanatory and diagnostic models has been neglected in the literature. Ancient explanatory models are often uncritically accepted as fact by traditionalists, whilst being rejected as speculative oriental metaphysical nonsense by staunch biomedicalists. This paper examines this problem, focusing particularly on research that has explored Chinese medical theory using biomedical methods. It is argued that both credulous acceptance and uninformed rejection of the tradition represent flawed positions, and that rational investigation of the fundamental ideas of Chinese medicine is important if this holistic medical tradition is to claim validity in the future practice of medicine.

Existing research into acupuncture and Chinese Medicine (CM) has focused mainly on its efficacy; to date well over ten thousand research papers have dealt with this question. Besides this material many studies have investigated the mechanisms underlying acupuncture and Chinese herbs. The Canadian neurobiologist Professor Bruce Pommerantz, who has researched acupuncture mechanisms for three decades, claims that more is known about the mechanisms of acupuncture for pain relief than is known about most pharmaceutical drugs.¹ Such work has contributed to an increased acceptance of acupuncture and CM in the West, although it has done little to foster acceptance of its associated traditional explanatory model. It therefore seems remiss of those of us practising according to the historical tradition to neglect research aimed at evaluating CM's diagnostic and explanatory models. It might be that CM theory is perfectly pragmatic and rational, as most traditional advocates believe - or on the other hand it may be the case that it is indeed nonsense, as its critics claim. More likely the truth lies somewhere in between these polarities: that there is much of value in China's medical tradition, that is mixed together with beliefs that are untenable in the modern world. In the absence of critical appraisal and research, how can we tell? This is the nettle that I feel we have to grasp in order to balance respect for our traditional legacy with the demands of modern ethical practice. If, as custodians of this medical legacy, we wish to resist its attrition and marginalisation, I believe that it is incumbent upon us to put ourselves in a position to clearly demonstrate its rational basis.

In my first decade of CM study and practice I felt I needed to satisfy myself that it was valid, feeling that I should not practise medicine professionally without good reason to suppose that it would benefit my patients. Having a background in medical science I sought this validation through compulsive reading of clinical and biomedical research from China and the West. The realisation then dawned that advocates of CM in the West (myself included) had accepted its traditional doctrines in an unquestioning, uncritical - perhaps even credulous - way. CM's apparently metaphysical theories were appealing but were they actually true? The medical authorities in communist China had themselves already engaged in a critical process of sorts, but with hindsight we now see that this had been distorted by political agendas that made it expedient to rush towards editing, sanitising and simplifying their medical legacy. From that time onwards most research has addressed questions of therapeutic efficacy and mechanism such as 'Does it work?' and 'How does it work?'. Considerably less attention has been directed towards the verification or critical review of the time-served explanatory models.

In the first half of the 20th century the survival of traditional medicine in China was challenged by those aiming to discard it in favour of Western biomedicine, just as modernisers in Japanese had previously done.² Traditional medicine survived this attempted suppression, partly due to protests and demonstrations, and perhaps also because its traditional medical doctrine is less challenging on home ground than in the West. Chinese people are

not more credulous than Westerners, but they can more easily understand and relate to the core concepts of CM, embedded as they are in the language itself and in ancient and ongoing cultural norms. In China, CM's utility may appear more self-evident and its terms less outlandish.³ The different context in the West had contributed to a greater sense of polarisation between 'traditionalists' and 'biomedicalists'. Self-appointed 'quackbusters' have not felt inhibited from disseminating their prejudices, despite the fact that very few of these critics have made a detailed study of Chinese medicine. Biomedical fundamentalists often charge traditional practitioners with adherence to romantic and deluded beliefs that are based on medieval oriental metaphysics, beliefs they feel should be abandoned. If CM's traditional diagnostic and explanatory models are to survive in the face of such challenges, advocates of the tradition must construct a more substantial case. This can be done by better communication of its rational basis, by supporting the debate with some level of structured, rational argument. When we are asked about 'yin deficiency' we should be better placed to justify its objective basis. This further refinement of the tradition is necessary, not simply to meet the objections of critics, but also to support our own professionalism by allowing Chinese medicine to develop further through critical reflection. I believe we can use science and critical reflection to improve Chinese medicine. Many of the greatest physicians of CM history did the same, challenging orthodoxy by checking the validity of received doctrine against experiential reality - a factor that has prevented its practices from becoming frozen in time. We have a responsibility to emulate this spirit, to check all aspects of CM using the most penetrating intellectual tools available to us.

In the late 1990's I brought together a decade of textual research and reflection on this issue in an MSc dissertation,⁴ where I made the case that, in addition to basic efficacy-related evidence, we should formally evaluate and reinterpret CM's explanatory model. It is quite possible that such critical scrutiny of the tradition might lead to abandonment of some of its ideas, or even - as some would have it - complete rejection of the traditional model. After all, we have to entertain the possibility that the critics of CM might - in some respects - be right. At least acupuncture and herbal medicine practice would then rest on informed critical examination rather than groundless belief. Neither credulous acceptance nor ignorant rejection do justice to the legacy we have inherited from countless medical thinkers during China's long history - doctors who countless times have tackled dysentery, pain, pestilence and the many other ills of mankind. In addition, we have a debt to the many

Neither credulous acceptance nor ignorant rejection do justice to the legacy we have inherited from countless medical thinkers during China's long history.

millions of patients who have given their lives in the development of this medicine.

There are ethical and medico-political dimensions implicit in bringing CM to the West. Ted Kaptchuk⁵ illustrated this key issue well by telling a story of a Chinese technician whose job was to fix equipment at a mission hospital in Cambodia. When he retired to his village in rural China he took with him stocks of penicillin and syringes and used these to set up his own clinic offering 'Western medicine'. Emulating what he had seen in the mission hospital, he simply provided his patients with injections of antibiotics. Whilst he may have achieved some spectacular results, we have to question the ethics of his description of his practice as 'Western medicine'. However well-meaning, it might be better described simply as health fraud, because a crucial ingredient was missing - knowledge of biomedical theory and diagnostics. In the same way CM does not consist simply of its techniques, such as the insertion of acupuncture needles, but must include its associated methodology; having an understanding of its underlying theoretical system is central to ethical practice and, some would say, optimal efficacy. If, that is, the traditional explanatory models can indeed be shown to be valid.

A prerequisite to research into CM's models is that we ensure that we understand them accurately. CM is hard to communicate because of the language and thought barriers that exist between East and West and between now and the distant past. The language and methodology of CM can appear outlandish at first, being so different to that of biomedicine it can easily sound like the astrology, metaphysics and 'vitalist' medicine that was rejected by science over a century ago. It is, however, conceivable that the explanatory model that evolved to serve CM might just compensate for a significant blind-spot in modern medical practice. For many people, despite its unarguable success in defining the chemical and physical roots of existence, biomedicine appears to have reached something of a 'paradigm crisis' caused by the huge complexity of the biological systems it describes. As a youthful undergraduate I recall being awestruck by a professor's poster that summarised the main biochemical pathways - numerous enzymes and biochemical substrates connected by a spaghetti of arrows. How, I wondered, could pharmacology possibly predict the innumerable knock-on effects of, say, chemically blocking one of these arrows (which

is essentially what most pharmaceutical interventions aim to do)? Back then I was concerned about the problem of trying to learn and interpret this complex array of data; now I am sure that nobody can. Our bodies are simply too complex to be fully understood and therapeutically influenced at this level, which is why pharmacology is often fraught with difficulty at its practical end-point – the treatment of real people. Now, decades later, biochemists could wallpaper entire medical schools with such biochemical charts. Reductionist science has power in many situations and deserves respect, but medicine also needs systematic clinically-based explanatory models that map the body's emergent properties, in order to temper the illusion that medical understanding comes simply from naming myriad components and joining them up with arrows. This is where biomedicine seems weak: it lacks an overarching systematic and pragmatic explanatory model – a model for interpreting, categorising and making sense of real-world clinical experience. This, many believe, is the map offered by CM.

Can we call the Chinese medicine process a 'medical model'?

During my research I wanted to check whether it would be accurate to dignify Chinese medicine's accumulated set of ideas by referring to them as an explanatory medical model. I sought an expert definition from a medical theoretician:

'A [medical] model is a representation of a complicated process as an abstract set of relationships among its known or conjectured components. Models are used to help understanding, to allow practical applications even when the system is not fully understood and to prompt further useful enquiry. They do so by reorganising facts and ideas in terms that are compact and readily grasped. Models convert the high cardinality of the data into a lower dimensionality...'⁶

The Chinese medical model fits this definition remarkably well. Indeed, it could be argued that in terms of clinical medicine, the CM explanatory model fits this definition better than modern biomedicine.

The problem of terminology

One specific hindrance to understanding is to do with reflex perceptions of the technical terminology used in Chinese medicine. Practitioners of this medicine have to face the fact that to outsiders it sounds like oriental astrology. The problem is thus not only its apparent impenetrability, but also our failure to translate its ideas into familiar terms. Faced with the question,

'What do you mean by Spleen qi deficiency?', few traditionalists can offer a coherent, verifiable and scientifically plausible answer. This is a situation that leaves traditionalists vulnerable to denigration. Bringing CM to the modern world involves not only biomedical research to better understand what Spleen qi deficiency means in terms of the realities of biomedicine, but also deeper linguistic and semiotic study of Chinese sources so that we can be certain that we have interpreted the tradition accurately. For various reasons many of the technical terms used in CM have not been transmitted effectively to the West, in particular due to the high degree of contextuality inherent in the Chinese language. Ancient classical Chinese had limited phonemes and characters available, so that words had flexible meanings that varied considerably according to context. When CM physicians talk about qi or yin and yang, they are using these terms specifically in the context of medicine, which is not necessarily congruent with their use in astrology, philosophy or metaphysics. CM's terms are qualified by their medical context. Often lost in translation, this flexibility of meaning easily confuses both the traditional CM practitioner and the biomedically-minded, beguiling the former but alienating the latter, and allowing each to paint CM's ideas in the colours they suppose them to be. This issue needs to be addressed so that research is not unfocused or misdirected.

A significant part of the problem therefore comes down to semiotics - how we understand the meaning of terms. Biomedical orthodoxy does not like the *language* of CM - it appears on the surface to be alien, prosaic and metaphysical. This is less problematic for the Chinese speaker: listening to the radio in Beijing one might hear the phrase '*jintian de tianqi hen hao*'. *Jintian* means 'today', *tianqi* might be translated 'heaven energy' and *hen hao* means 'fine'. As far as I can tell, native Chinese speakers do not perceive the characters *tianqi* as 'heaven energy', they simply hear the word 'weather'. An overly romantic Westerner, on the other hand, might prefer to hear 'heaven energy'.

Technical terms used in most academic fields tend to sound odd to outsiders, and such problems are amplified by translation. Biomedicine derived its vocabulary from Greek and Latin to help distinguish it (and its professional exponents) from ordinary language and vernacular knowledge. A useful by-product of this was that the terms gained a certain dignity and resonance of unassailable truth, assisted perhaps by the traditional association of Latin with the church, the law and learnedness. Translating a Latinate biomedical diagnosis into plain English we might get 'washbasin bursting into flames disease' – a literal translation of pelvic inflammatory

disease (pelvis is Latin for washbasin). All language is metaphor, but familiar metaphor is more easily accepted as rational fact. China's ancient physicians could not employ this borrowing trick to aggrandise their medicine - in a sense Chinese *was* the Latin of the orient.⁷ Instead the founders of Classical medicine in Han dynasty China had to attach new technical meanings to existing vernacular words.

It is awkward to coin neologisms using the Chinese language, and this was much more the case two thousand years ago when the lexicon was smaller. Alphabetical languages tell you how to say the word, but this is generally untrue with Chinese: invent a new character and nobody will be quite sure of how to say it or what it means! For this reason CM's technical vocabulary was more convergent with everyday language; that is, it had to share its terminology with ordinary Chinese words. Professional initiation involved learning the technical meanings of familiar words, because their meaning in the context of medicine was often quite different to their vernacular meaning. This is central to our understanding of CM. It means we have to be careful who we choose as our informants: say the word *jing* to a Chinese person on the street and they will likely hear 'sperm'; say the word *shen*, and most hear 'God'. Unless, that is, you are in a *taijichuan* class, where cognition of these words shifts as a result of the specific context.⁸ Correct understanding therefore depends to a significant degree on context, a situation that has caused problems in the importation of CM to the West. Even Chinese natives struggle to make sense of Chinese medicine's technical writings. The character *men* (闷), for example, usually means 'bored' or 'stultifying' in ordinary Chinese, but has particular significance in medicine that is not especially well-conveyed by the usual translation 'chest stuffiness' (*xiong men*).⁹ The technical meaning of ordinary characters creates difficulties for a non-medical Chinese person attempting to read a CM textbook - lay readers are able to recognise the characters but the text appears to be nonsense.

This issue of contextual meaning exists to a lesser extent in English, although our cognition is so automatic that we scarcely notice it. Our understanding of the word 'energy', for example, shifts depending on whether we are listening to a physicist, a crystal healer or a power company executive. The word *qi* means different things to different people too: an athlete or an actor, a painter, a *taiji* instructor or a chemist. When using words like wind or damp, we should therefore reflect carefully on the meaning, and not simply accept their surface meanings. In effect, as Kovacs¹⁰ pointed out, CM is at some level untranslatable; to fully understand it you have to understand the Chinese language. It therefore seems unacceptable for critics

Practitioners of this medicine have to face the fact that to outsiders it sounds like oriental astrology.

to dismiss CM without the benefit of such linguistic insight.

This kind of discussion is relevant to research into CM's explanatory models. It is an important part of the process of getting to grips with the true nature of this medicine. In making sense of CM's ideas and concepts we have to take account of such linguistic issues. In my view this involves accepting that CM comes with a long-established technical language - Chinese - that needs to be understood before the medicine can be properly understood. I also believe that we should respectfully examine CM's ideas using the most penetrating tool available - science (by which I mean true science - that greets new ideas with openness and a sense of possibility). The models provided by both WM and CM are maps of medical reality. The former is largely a map of chemical and structural realities. The latter is a carefully constructed, logical, condensed model of clinical phenomena, a systems approach that has been burnished by time and the experience of millions of literate physicians into a practical system of medicine. Most of those who have learned to apply this model in clinical practice - including those with a scientific or medical background - find it offers a remarkably good fit to clinical reality. Only be those who genuinely understand CM's explanatory models are properly qualified to test their validity.

In sum, I believe that as well as asking 'Does it work?' and 'How does it work?', CM researchers should be asking 'How true are its ideas?', or even 'Which of its ideas are unsupportable in the modern world?'. If we succeed in rationally verifying CM's explanatory model - even parts of it - the implications for medicine in the future may be profound. By looking at what has already been completed in terms of research we might more easily understand how this might be progressed. Using a modern mindset we can ask, 'What is Kidney yin deficiency?', 'What is dampness and in what way does it affect health?', or 'What has actually changed in a patient who has developed Kidney yang deficiency?'. These are questions that I hoped to find addressed in the published literature.

Study findings

When I began to assemble material to review for my MSc project in 1998, I was already aware of a strand of research in China that investigated traditional theory in modern scientific terms. My aim was to scope, survey and critique these studies. I also aimed to discover the extent to which others in the West had

- ↑ urinary corticosteroid levels
- Atrophy of pituitary, thyroid and adrenal glands and gonads
- ↓ haemoglobin (by >10 per cent in 66 per cent of cases of yin deficiency)
- ↑ blood viscosity:
 - venous stasis and microcirculation deficits
 - kidney glomerulus degeneration
 - chronic hypoxia of all organs

Table 1: Summary of biomedical correlates of yin deficiency

- ↓ blood pressure and ↑ parasympathetic activity
- ↓ urinary catecholamine levels
- ↓ immune function
- ↓ alkaline phosphatase in salivary glands
- ↓ glycogen, CHO, protein, fat metabolism
 - improvement claimed with Chinese yang tonic herbs
- Trace element changes in blood:
 - Copper levels ↑ by 10 per cent (in yin deficiency by 30 per cent)
 - Serum bromide levels ↓ by 15 per cent
- Skin resistance changes:
 - Normal= 31.9 kΩ; yang deficiency = 9.8 kΩ; yin deficiency = 48.0 kΩ
- Yang deficiency subjects no ↓ in thyroxins
- Generally ↓ protein synthesis
- ↓ in ratio of c-AMP to c-GMP (N=5; yang deficiency=2.5)

Table 2: Summary of biomedical correlates of yang deficiency

- ↑ undigested food in stool
- ↓ stomach pH, pancreatic and salivary enzymes
- ↓ cyclic-AMP in stomach mucosa and other more delicate tissues
- ↓ gut xylose uptake in children (CHM treatment reverses)
- ↓ stomach mucosa maturation and ↓ in secretory cells
- Systemic protein and amino acid malnutrition
- ↓ phagocytosis and cellular immunity

Table 3: Summary of biomedical correlates of Spleen qi deficiency

critically explored Chinese medicine's explanatory models. Omitting fringe science and unsubstantiated speculation of the quantum energy kind, I was disappointed to discover a near-complete absence of such discussions in the Western literature on Chinese medicine. Apart from the writings of sceptics, there seemed to be virtually no discussion addressing questions along the lines of, 'Is Chinese medical theory a precious gem or a load of old Oriental mumbo jumbo?'. I felt that our failure as exponents

of this medicine in tackling this question had left us open to charges of delusion, credulity and orientalism. If, due to our laxity, those who have influence but little understanding of CM eventually succeed in discrediting it we will have failed to properly honour the work of the masters of the past.

Advocates of CM recognise, of course, that the true proof of the Oriental medical pudding is in the eating – its ultimate validation derives not from biomedical testing but from clinical outcomes. The trouble is that the more we prove that, say, acupuncture works, the more we encourage its appropriation by those with little understanding or respect for the tradition. If we wish to counter the calls for traditional methodologies to be abandoned on the basis that they have no objective reality, then one way forward would be to assemble together the available evidence for their validity. To keep the project compact I chose to limit my remit to studies that looked for biomedical correlates of the components of basic *bagang* (eight principle) pattern diagnoses. Some of these are briefly summarised below:¹¹

Gastritis biopsies and CM diagnosis

In 1994 Ren et al¹² reported on 300 gastritis patients who were examined by a team of CM physicians and categorised into three types: qi, yang and yin deficiency of the Stomach and Spleen. Biopsies of the stomach mucosa were taken for each subject and graded according to a four-part scale: chronic superficial gastritis and chronic atrophic gastritis grades I, II and III. This allowed comparisons to be made regarding the congruence between CM and biomedicine data. Seventy-six per cent of those with qi deficiency showed the mildest cellular pathology, whilst those with yang deficiency demonstrated more pronounced tissue changes. Patients with signs of yin deficiency had the most advanced degeneration, with sixty four per cent of these showing stage II or III changes. The correlations between CM and WM diagnoses were statistically significant, suggesting that CM diagnostic typing is a reasonably reliable predictor of the level of pathology in gastritis. The changes seen in patients exhibiting yin deficiency suggested pre-malignant states, pointing to the potential clinical value of CM diagnostic methodology, which offers a non-invasive method of identifying patients at greater risk of malignancy.

Plasma adrenaline levels and Liver yin deficiency

Yan et al¹³ measured adrenaline and noradrenaline levels in 200 patients diagnosed with CM Liver patterns and compared them with 96 healthy controls. They claimed to demonstrate a significant link between Liver yin deficiency and low levels

of these hormones, whereas subjects with excess Liver patterns showed raised levels of adrenaline and noradrenaline. Perhaps overstating their case, they concluded that their study showed 'reliable objective parameters for the study of the pathophysiological basis of the liver excess and liver deficiency patterns ...'.

Correlates of yin and yang deficiency

Many methodologies have been used with the aim of correlating states of yin or yang deficiency with biomedical measures. Some of this work is problematic: for example the tautological finding that yang deficiency subjects have chilly extremities, when the definition of yang deficiency in the study includes this sign as a diagnostic criterion! The many studies of yin and yang deficiency raise issues that are too involved to detail here, although some of these studies point to methodologies that might be useful for further research. Much of this work - of necessity in a rather dense format - is compressed and presented in Tables 1 and 2.^{14, 15, 16, 17, 18, 19}

From these studies we can conclude that yin and yang deficiency patterns do not correlate to single factors, but to shifts in numerous physiological markers. In some ways this may turn out to be a more realistic picture of health dysfunction than the biomedical belief in single-point dysfunction treatable by single-point pharmacologic interventions.

Correlates of Spleen qi deficiency

In the decade since I completed my study, new work has been published in China that matches CM diagnoses to biomedical measures, some of which I summarise in Table 3.²⁰

Since finishing my study more work has appeared that has explored the biomedical correlates of CM patterns. Bob Flaws has translated some of these, including papers on blood stasis,²¹ inflammation,²² qi deficiency²³ and yin-yang deficiencies;²⁴ these are accessible on his website www.bluepoppy.com.

Conclusions

Aside from the value of the above work in meeting accusations that CM is based on a nonsensical model, we might reasonably ask about the relevance of such research to clinical practice, and whether it really contributes anything to patient care. A well-known example from China can be seen in the treatment of autoimmune diseases such as systemic lupus erythematosus (SLE). In such collagen diseases, both the illness and its biomedical drug management lead to degenerative kidney disease that is identifiable in both CM and WM terms. Given the lack of effective WM medication for such conditions, CM care has

Only those who genuinely understand CM's explanatory models are properly qualified to test their validity.

been extensively researched for its ability to support kidney function. The problem with CM treatment in this situation is that patients alternate between patterns of Kidney yin and Kidney yang deficiency, and the clinical signs of such changes lag behind the changes in pathology. Having discovered changes in blood markers linked to yin and yang deficient pathology, Chinese physicians sometimes use blood tests to help determine appropriate Chinese herbal prescriptions.²⁵ Whilst I am personally suspicious of any moves to replace good clinical acumen with tests in general CM practice, for the management of conditions such as hepatitis, HIV, cancer or SLE, such practices might improve clinical outcomes. There may be many other clinically relevant applications of this type of research; it may, for example, be useful for us to know that a patient with pronounced Stomach yin deficiency has an increased risk of stomach cancer. In addition, a respectful scientific scrutiny of CM may lead to refinement of the tradition, with some redundant or unsupportable notions being discarded so that new, more accurate ones can take their place. Re-evaluation is an important part of the historical tradition.

What does it all mean?

There is a body of knowledge that supports the explanatory model of CM in ways that make sense in biomedicine. When critics claim that terms like yin, yang and qi amount to nothing more than oriental astrology and deserve no place in today's medicine, we have the beginnings of the resources to address such criticism. Diagnoses such as Kidney yin deficiency, Spleen qi deficiency and Liver yin deficiency almost certainly correlate to something 'real' (that is, measurable) in scientific terms. At the same time, these changes are multifactorial and must be understood as complex patterns of change rather than the single biochemical changes that biomedicine prefers to see as a root definition of disease. Unfortunately, whilst existing studies of the kind outlined above offer a rational basis of support to the CM tradition, the evidence remains insufficient. I have not, for example, come across any studies into the nature of the CM concept of phlegm. There has been some work on damp-heat²⁶ and blood stasis,²⁷ but there is much more work to be done, both in terms of properly evaluating the evidence we already have and initiating new investigations.

The pragmatic, real-world, time-tested medical model offered by Chinese medicine deserves to be properly evaluated; indeed it may prove to be the transfusion of Oriental wisdom needed by clinical medicine in the West.

The pragmatic, real-world, time-tested medical model offered by Chinese medicine deserves to be properly evaluated; indeed it may prove to be the transfusion of Oriental wisdom needed by clinical medicine in the West. I believe that Chinese medicine is largely based on reality... but not entirely! Sometimes it appears more grounded in reality than biomedicine, but it is not perfect. The issue is, who will carry forward the work of critical appraisal? If we fail to support the tradition using rational investigation, what will happen to it in future? We are the generation responsible both for defending and improving this legacy. ■

Acknowledgment

I would like to thank Dr. Hugh MacPherson, Research Fellow at York University, U.K. for his kind help and support in this work and for coercing me to present this précis of my study for publication.

Charles Buck is Reader in Chinese Medicine and a post-graduate degree supervisor at the Northern College of Acupuncture, York, UK. He is in his third decade of Chinese medical practice and academic work. A popular speaker at conferences and seminars in the UK and Europe Charles is known for his lucid and engaging style. He can be contacted at chesterclinic@yahoo.co.uk or see www.acudox.com.

Endnotes

- 1 Pommerantz, B. (1996). Presentation at the *Ancient Medicine in Modern Times* Conference, Scheveninghe, Netherlands.
- 2 Fu Weikang, chief ed. (1989). *Zhongguo Yixue Shi [History of Chinese Medicine]*. Publishing House of the Shanghai College of TCM
- 3 There are also, of course, ongoing tensions between advocates of biomedicine and traditional medicine in China.
- 4 Buck, C. (1999). "Evaluating Chinese medicine's theoretical foundations - do ancient paradigms merit a place in modern medicine?". University of Wales: MSc Thesis
- 5 Kaptchuk, T. (1983). *Chinese Medicine – The Web That Has No Weaver*. London: Rider
- 6 Murphy, E. A. (1997). *The Logic of Medicine*. 2nd Ed. Baltimore: John Hopkins University Press
- 7 Scholars of surrounding countries such as Japan and Vietnam had to learn Chinese to give them access to Chinese learning.
- 8 Thus in taijichuan practice, *jing*, *shen* and *qi* refer to a self-directed conceptualisation of internal energetic alchemy, rather than 'generating sperm to strengthen God'! Some may disagree, but personally I am not entirely convinced that the *jing-shen-qi* concept is transferable even between the contexts of *qigong* and Chinese herbal medicine.

- 9 The term chest stuffiness, for example, fails to convey the various emotional senses of the Chinese *xiong men*, such as boredom or even heartache.
- 10 Kovacs, J. (1989). "Linguistic Reflections of the Translation of Chinese Medical Texts" in Unschuld, P. (1989). *Approaches to Chinese Medical Literature*. Boston: Kluwer Academic Publishers
- 11 For reasons of brevity many details and more detailed critique from the original dissertation have been omitted.
- 12 Ren, Liu, Niu, Lu and Lu (1994). "Comparative Observations on the Types of Atrophic Gastritis and Biopsy Pathology of Gastric Mucosa". *Journal of Traditional Chinese Medicine* 14 (4) 303-307
- 13 Yan, Jin, Zhang, Li, Shi, Chen, Li & Lin (1997). "A study on plasma norepinephrine and epinephrine levels in TCM liver syndromes". *Journal of Traditional Chinese Medicine* Vol. 17 (4) : 294-298
- 14 Zhao W. K. (1980). "Daily urinary 17-hydroxycorticosteroids in fasting subjects with yang xu, yin xu and heart fire". *Shanghai Journal of Chinese Herbal Medicine* (5): 42
- 15 Kuang An et al. (1979). "Yang xu disease and human endocrinology - initial investigations into immunology and its relationship to corticosteroids". *Chinese Journal of Internal Medicine* 18 (2): 105
- 16 Zhu, Li, Kuang, Tan, Qin, Sheng, Chen and Li (1983). "A Preliminary Study on Serum Trace Elements in 'Yin-Deficiency' and 'Yang Deficiency' Patients - Application of the PIXE analysis in medical science". *Journal of Traditional Chinese Medicine* Vol 3 (2) p145
- 17 Zhang J. Q. (1989). "Studies on Yin Deficiency". *Journal of Traditional Chinese Medicine* Vol. 9 (1); 75-78
- 18 Zhang J. Q. (1982). "Clinical and Experimental Studies on Yang Deficiency". *Journal of Traditional Chinese Medicine* Vol. 2 (3) p237-242
- 19 Zhang & Sun (1985). "Blood Chemistry in Deficiency of Kidney Yin and Deficiency of Kidney Yang Types of Subacute Systemic Lupus Erythematosus". *Journal of Traditional Chinese Medicine* Vol 5 (4) p265
- 20 Sun & Liu (2001). *Medicine in China Update*. 1(1)
- 21 www.bluepoppy.com/cfwebstorefb/index.cfm?fuseaction=feature.display&feature_id=1224
- 22 www.bluepoppy.com/cfwebstorefb/index.cfm?fuseaction=feature.display&feature_id=1117
- 23 www.bluepoppy.com/cfwebstorefb/index.cfm?fuseaction=feature.display&feature_id=1401
- 24 www.bluepoppy.com/cfwebstorefb/index.cfm?fuseaction=feature.display&feature_id=1228
- 25 Zhang & Sun (1985). "Blood Chemistry in Deficiency of Kidney Yin and Deficiency of Kidney Yang Types of Subacute Systemic Lupus Erythematosus". *Journal of Traditional Chinese Medicine* Vol 5 (4) p265
- 26 Chen, Dai, Song & Lu (1982). "Exhaustion of Liver-Kidney and Internal Deposition of Damp-Heat Post-Hepatic Cirrhosis and Hepato-Renal Syndrome". *Journal of Traditional Chinese Medicine* Vol.2 (3) : 227-236
- 27 Song, Liao, Lu, Zhang, Ren, Yuan & Gao (1982). "Experimental and Clinical Rheologic Observation in Deficiency of Vital Energy". *Journal of Traditional Chinese Medicine* Vol. 2 (3) p223- 226