

On the Margins of Science:

Boundary-Crossing Work and “Making Chinese Medicine Scientific” movement in 1930s and 1940s

Abstract

When a marginalized knowledge tradition is excluded from the dominant definition of “science,” how do its practitioners respond? The concept of boundary-work, foundational to science and technology studies, has provided powerful tools for analyzing how dominant groups demarcate science from non-science. However, it has less to say about what happens on the other side of the boundary—among those whom the demarcation is designed to exclude. This article recovers the epistemic responses of Chinese medicine practitioners who, during the Republican-era “Making Chinese Medicine Scientific” movement in 1930s and 1940s, refused to accept their exclusion from science and undertook what I call boundary-crossing work—the strategic and contested practice of dual redefining “science” and “Chinese medicine” to forge epistemic pathways across the boundary established by biomedicine. Drawing on 116 articles from Chinese medical periodicals, this article categorizes three main forms of boundary-crossing work: Pragmatists redefined science as therapeutic efficacy and Chinese medicine as an extensive clinical archive; Westernizers conceptualized science as positivist analysis and Chinese medicine as a repository of empirical materials; Rationalists interpreted science as systematic reasoning and Chinese medicine as an obscured theoretical system awaiting purification. These divergent epistemic practices not only challenged biomedical hegemony but also contributed to the pluralistic landscape of medicine in China. By shifting analytical attention from boundary-work to boundary-crossing work, this concept invites a reorientation in the study of demarcation between science and non-science by illuminating the epistemic agency of the marginalized epistemic groups, and by revealing that the outcome of epistemic contests is not necessarily demarcation but may be pluralization.

Keywords: boundary-crossing work, Chinese medicine, epistemic practices

Introduction

“Wisdom becomes nonsense; kindness, oppression:

To be a grandson is a curse.

The right that is innate in us

Is not discussed by the profession.” (Goethe and Kaufmann 1990, 203)

In November 1936, medical historian Fan Xingzhun published an article “An Autopsy of Hybrid Medicine” in the medical journal *Chinese-Western Medicine*. In this article, he criticized the “Making Chinese Medicine Scientific” movement¹ that gained traction in medical field during the 1930s:

Can Chinese and Western medicine be united to create a distinct form of medicine? It would be akin to breeding a horse with a donkey, yielding a mule that is neither horse nor donkey...Yet the project of “Making Chinese Medicine Scientific” having emerged and gained widespread acclaim, has now persisted

¹ The reason of using “Chinese Medicine” rather than the common name “Traditional Chinese Medicine (TCM)” is that TCM typically refers to the system of Chinese medicine that emerged after the People’s Republic of China was established in 1949, following a series of efforts to organize and standardize medical knowledge.

for several decades; and still it has failed to resolve even a single disease name or a single symptom. Its efficacy, therefore, is plain for all to see.²

The excerpt captures a predicament that Chinese medicine practitioners faced throughout the early twentieth century. By the 1920s, Western-trained biomedical practitioners had secured institutional dominance through state-backed public health campaigns and epidemic management, embedding Western medicine firmly within the field of science while dismissing Chinese medicine as pseudoscience or metaphysics deserving abolition. Against this backdrop, Chinese medicine practitioners launched the “Making Chinese Medicine Scientific” movement during the 1930s and 1940s, seeking to establish the scientific legitimacy of their own medical tradition.

Movements to defend traditional medicine against biomedical encroachment were not unique to China; similar dynamics unfolded in Japan, colonial Taiwan, and colonial Korea from the late nineteenth to the early twentieth century (Lewis and Macpherson 2008; Clark 2020; Dongwon 2008; Suh 2017).³ However, whereas these movements were primarily oriented toward the preservation or revival of existing traditions, the Chinese “Making Chinese Medicine Scientific” movement pursued a qualitatively different objective: not merely defending traditional medicine, but actively redefining its relationship with science itself. It is this distinctive orientation that makes the Chinese case particularly revealing for theorizing how marginalized knowledge systems engage with scientific authority.

Fan’s critique presupposes that “Making Chinese Medicine Scientific” was a unified endeavor—those practitioners shared a single understanding of science and pursued a common path toward it. A systematic examination of medical journals published by Chinese medicine practitioners during this period, however, reveals a far more complex picture. Rather than converging on one strategy, practitioners developed plural and competing approaches to bridging Chinese medicine with science. They disagreed fundamentally over what counted as “scientific,” which elements of their tradition should be preserved or discarded, and whether Western biomedicine constituted the sole model of scientific medicine. In short, the movement was defined not by consensus but by internal epistemic contestation.⁴

A rich body of historical scholarship has documented the epistemic transformations of Chinese medicine in modern China, highlighting processes of “heterogenization” and “hybridization” that challenge essentialist portrayals of Chinese medicine as a static, homogeneous tradition (Kuriyama 1999; Furth 1999; Lei 2002; Scheid 2002, 2007; Andrews 2014; Chiang 2015). These works have convincingly demonstrated that Chinese medicine

² Fan Xingzhun, “A Dissection of Hybrid Doctors” (*Za zhong yi zhi pou shi*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 11, November 1936, CCMPO (Compilation of Chinese Medicine Periodicals Online) no. 5-12-13.

³ East Asia possessed a long-time tradition of medical pluralism; prior to the advent of biomedicine, Chinese medicine spread to countries and regions such as Vietnam, Japan, Korean Peninsula, and Taiwan. Local practitioners did not directly accept it, while to localize the medical knowledge to adopt their bodies and lands’ herbal resources. For instance, practitioners in Vietnam argued that the body of Vietnamese people differs from that of northern Chinese, so only herbs cultivated in Vietnam’s tropical climate can effectively treat them (Monnais-Rousselot et al. 2012). When biomedicine had been introduced into this area, there were long-standing dynamics between traditional medicine and Western medicine across this area from the late nineteenth to the early twentieth century. For instance, during the Meiji Restoration (1868–1912), the Japanese government’s rapid adoption of Western science and biomedicine led to the systematic marginalization of traditional medicine. This triggered the “Debate over the Preservation or Abolition of Kampo Medicine” from the 1870s to the 1890s (Clark 2020). Furthermore, during Japan’s colonial rule over Taiwan (1895–1945) and the Korean Peninsula (1910–1945), the colonial administration imposed stringent restrictions on indigenous medical practices. These repressive measures, however, sparked the “Revival Movement of the Imperial Way of Han Medicine” in Taiwan during the 1920s and the “Han Medicine Revival Movement” in Korea during the 1930s (Dongwon 2008; Suh 2017; Shaohong 2017).

⁴ Although Sean Hsiang-lin Lei (2002) claimed that Chinese medicine had shifted toward an experience-based medical epistemology, this epistemology is not stable and systematic, but consists of different variations depending on certain periods. See also Elisabeth Hsu (2001), Volker Scheid (2002), Bridie Andrews (2014), Howard Chiang (2015), and Mei Zhan (2009).

underwent profound changes through its encounters with Western biomedicine. Yet this scholarship has predominantly framed these transformations as responses to biomedical hegemony, thereby conflating the relationship between Chinese medicine and science with that between Chinese medicine and Western medicine—as if Western medicine were science itself. This conflation obscures a crucial distinction. For Chinese medicine practitioners in the 1930s and 1940s, “science” was not simply a synonym for “Western medicine”; it was a contested concept whose meaning was itself at stake. This article therefore asks: How did Chinese medicine practitioners interpret the relationship between their medical knowledge and the field of science? Through a systematic analysis of the “Making Chinese Medicine Scientific” movement, I argue that practitioners did not passively accept Western medicine’s claim to scientific authority but actively constructed diverse pathways for establishing Chinese medicine’s scientific legitimacy. These pathways diverged because practitioners simultaneously held competing definitions of what counted as “science” and competing visions of what constituted the essential core of “Chinese medicine.” Each redefinition of science entailed a corresponding reconceptualization of Chinese medicine itself—what to preserve, what to discard, and what to transform—such that the two operations were mutually constitutive rather than separable.

To theorize this process, I engage with the concept of boundary-work (Gieryn 1983, 1999), the dominant analytical framework in STS for examining how the boundaries of science are constructed and maintained. While boundary-work has illuminated how dominant groups draw epistemic boundaries to exclude competitors from the field of science, it tends to presuppose that such contests produce a singular epistemological outcome—one victor who monopolizes scientific authority. This framework offers limited analytical purchase on cases where marginalized knowledge systems neither accept their exclusion nor simply seek inclusion on the dominant group’s terms. Drawing on the “Making Chinese Medicine Scientific” movement, I introduce the concept of “boundary-crossing work” to capture the strategic practices through which excluded groups challenge established epistemic boundaries by simultaneously redefining the criteria of science and reconceptualizing their own knowledge system. As I demonstrate, Chinese medicine practitioners did not share a single definition of science, nor did they share a single understanding of what Chinese medicine was; their divergent dual redefinitions generated multiple epistemological pathways, ultimately pluralizing both the field of science and Chinese medicine itself.

The article proceeds as follows. I first review the theoretical literature on boundary-work and scientific demarcation, identifying its limitations and developing the concept of boundary-crossing work. After a discussion of methods and data, I analyze the “Making Chinese Medicine Scientific” movement through three epistemic groups—Pragmatists, Westernizers, and Rationalists—each of which simultaneously redefined what science meant and reconceptualized what Chinese medicine was, generating distinct epistemological pathways with divergent consequences for the tradition’s survival and transformation.

This case contributes to STS scholarship in three respects. First, empirically, it demonstrates that the encounter between traditional medicine and modern science did not inevitably produce biomedical hegemony; in the Chinese case, it generated epistemological pluralization within the traditional medical system itself. Second, theoretically, it advances the concept of boundary-crossing work to show that epistemological pluralism is not a pre-existing condition to be discovered but an outcome actively produced through the strategic practices of marginalized

groups—particularly through their competing dual redefinitions of both what counts as science and what constitutes the essential content of their own knowledge tradition. Third, it extends the study of medical pluralism beyond comparisons between different medical systems to examine internal differentiation within a single knowledge tradition, revealing how divergent engagements with science can fracture a nominally unified medical community into distinct epistemic orientations.

Theoretical Background

Inheriting Thomas Kuhn's legacy, a growing body of scholars across science and technology studies (STS) and the history of science has shifted analytical attention away from scientific truth in the essentialist account, focusing instead on the institutional and epistemic conditions under which certain forms of knowledge come to be recognized as part of science (Evans 2005; Gieryn 1983, 1999; Feest and Sturm 2011; Pickstone 1993; Whooley 2010, 2013; Cetina 2007). Despite ongoing methodological debates between these two fields (Daston 2009; Dear and Jasanoff 2010), both of them share this foundational commitment to rejecting essentialist accounts of scientific demarcation. Based on consistently rejecting the discovery of context, "a linear, progressive march in the elimination of error, asymptotically approaching nature" (Rheinberger 2010, xi–xix), a common assumption has been reached that demarcating science from non-science is not clearly delineated, but heavily relies on boundary-works in historical, contingent and organizational conditions. In other words, science is not regarded as a naturally bounded entity, including possess "particular (but nonaligned) borders and territories, landmarks and labels," but started out as a "featureless terra incognita" (Gieryn 1999: 32). Following the epistemic authority of science been viewed as the primary credibility, geography of science has been shaped by endless "epistemic contests" (Whooley 2013). Thomas Gieryn's concept of boundary-work has become the dominant analytical tool for examining these epistemic contests; however, as I argue below, it carries unexamined assumptions that limit its explanatory power—particularly its inability to theorize how marginalized groups actively reconstruct both the boundaries of science and the boundaries of their own knowledge. Although epistemic contests suggest the arena constituted of multi-actors, the concept boundary-work provided by Thomas Gieryn (1983; 1999) implicitly carries a single-actor perspective and epistemic zero-sum game. Specifically, boundary-work presupposes a single, dominant agent of action—that is, the side that successfully endows science with specific characteristics—and a singular epistemological victory, whereby one side becomes the sole embodiment of science within a particular disciplinary field. According to Gieryn (1999: 5–6)'s definition, boundary-work is "the discursive attribution of selected qualities to scientists, scientific methods, and scientific claims for the purpose of drawing a rhetorical boundary between science and some less authoritative residual non-science." Nevertheless, a deeper scrutiny of this foundational definition exposes undeniable theoretical blind spots in three key areas: the variance in power positions, the asymmetric nature of structural relationships, and the presumption of epistemic games as zero-sum.

First, despite highlighting multi-actors' practices of attribution, boundary-work obscures the substantial differences in power positionality among competing epistemic groups (Haraway 2013; Harding 1991). From a Bourdieusian perspective, any epistemic arena is not a level playing field, but a structured field constituted by the unequal distribution of capital—whether scientific credentials, institutional affiliations, state connections, or social networks (Bourdieu 1975). Actors' positions within this field determine both the strategies available to them and the

legitimacy of those strategies in the eyes of others. Yet Gieryn (1999: 22) categorizes participants in epistemic contests into three roles—contestants competing for epistemic authority, producers of relevant knowledge, and those influenced by the outcome—without accounting for how structural distance from the center of science shapes what each group can plausibly do or claim. In other words, different contestants may enter the same arena, but they do so with fundamentally unequal resources, and this inequality is not incidental but constitutive of the contest itself. Second, boundary-work implicitly encodes a structurally asymmetric relationship among epistemic groups, in which science occupies an authoritative center, and its competitors are systematically devalued through processes of othering. As Gieryn (1999: 22) demonstrates, the boundary of science is continuously produced by positioning certain forms of knowledge as its constitutive opposites. However, this analytic move has a significant cost: once a group is labeled as non-science, it is no longer treated as a legitimate epistemic challenger but is instead consigned to what Bowker and Star (1999) call a residual category—a classificatory remainder defined entirely by what it is not, rather than by what it does or claims. This categorical logic is consequential because it forecloses, at the level of theory, the very possibilities that historical actors pursued in practice: negotiation, mutual transformation, and reconciliation across epistemic boundaries. The STS research, however, offers abundant counter-evidence. AIDS activists, for instance, successfully negotiated with the biomedical establishment to reshape the design of clinical trial protocols, forcing a partial redefinition of what counts as legitimate scientific evidence (Epstein 1995). Autism patients not only built their own epistemic groups but also made alliance with some health professionals (Decoteau 2021). Such cases reveal that groups positioned as non-scientific others are not merely passive recipients of exclusion; they retain the capacity to contest, reenter, and ultimately alter the boundaries imposed upon them—a dynamic that boundary-work, locked into its asymmetric binary, cannot theorize. Taken together, these two assumptions converge in a third: the presumption that epistemic contests must produce a single winner. Third, the three variations of boundary-work that Gieryn identifies—expansion, monopolization, and protection—all presuppose an epistemic zero-sum logic: one group’s gain of scientific authority necessarily entails another’s exclusion from it. The only admissible outcome, within this framework, is a singular victor who becomes the sole legitimate representative of science within a given field. This logic does not merely overlook alternative outcomes—it structurally forecloses them. Epistemic co-existence, negotiated pluralism, or the simultaneous legitimacy of multiple knowledge traditions within the field of science are rendered theoretically unintelligible by a framework that defines success as monopolization. Yet the history of science repeatedly produces precisely these unintelligible outcomes (Pickstone 1993; Daston and Galison 2007). Star and Griesemer’s (1989) concept of boundary object demonstrates that epistemic groups operating from divergent frameworks can collaborate, co-inhabit, and even co-produce knowledge around shared objects—without ever reaching consensus or resolution. Cooperation across epistemic difference is not an anomaly to be explained away; it is a routine feature of scientific practice that Gieryn’s zero-sum model cannot accommodate. Moreover, this framework renders the resistance of excluded groups theoretically invisible: if the only outcome is a single winner, then the ongoing struggles of marginalized epistemologies—their refusal to concede, their attempts to re-enter, their capacity to refashion the very boundaries imposed upon them—fall outside the analytic frame entirely. What boundary-work ultimately cannot theorize is precisely what is most politically and epistemologically significant: the subaltern’s refusal to stay excluded.

The theoretical limitations of boundary-work are vividly illustrated by three successive moments in the history of Chinese and Western medicine in modern China. Together, these moments reveal what boundary-work cannot see: that epistemic boundaries are forged through asymmetric configurations of state power rather than on a level playing field, that marginalized groups retain the capacity to resist and refashion those boundaries, and that epistemic co-existence—rather than singular victory—is a historically recurring outcome.

The first moment concerns the consolidation of Western medicine's institutional dominance. The mid-nineteenth-century introduction of Western medicine by medical missionaries initially fostered a fluid period of knowledge negotiation, exemplified by the trend of “convergence of Chinese and Western medicine” following the publication of Benjamin Hobson's *A New Treatise on the Whole Body* in 1851 (Lei 2012; Karchmer 2013; Luesink 2019; Ma et al. 2026). However, the 1894 Hong Kong plague and the 1910 Manchurian epidemic fundamentally disrupted this dynamic (Choa 1993; Summers 2012; Du 2024; Tang et al. 2025). During these crises, germ theory and modern epidemiological interventions—microscopy, quarantine protocols, and face masks, notably championed by Dr. Wu Lien-teh—demonstrated undeniable efficacy. In the eyes of the state, Western medicine was thereby elevated from a foreign technique to an authoritative scientific truth. With the establishment of the North Manchurian Plague Prevention Service and the medical police system in Beijing (Benedict 1993; Wu 1995), Western medicine transformed from a localized practice into a state-backed apparatus; returning students trained abroad subsequently monopolized national health projects and demarcated Chinese medicine from the field of science (Lei 2014). This moment directly exposes the power-positionality blind spot in boundary-work: Western medicine's epistemic ascendancy was secured not through superior argumentation in open debate, but through its privileged institutional linkage with the state (Luesink 2012). The second moment concerns the failure of total exclusion. Emboldened by their institutional dominance, Western medical practitioners proposed the outright “Abolition of Chinese Medicine” at the first meeting of the Central Board of Health in 1929 (Croizier 1968; Andrews 2014). Yet this existential threat catalyzed the structural mobilization of the Chinese medical community: through the formation of medical associations, the publication of journals, and widespread social movements, subaltern resistance successfully thwarted the abolition proposal, culminating in the establishment of the Central National Medical Institute in 1931 (Scheid and Lei 2014). This outcome directly challenges the asymmetric othering assumption embedded in boundary-work: rather than being permanently relegated to the residual category of non-science, the Chinese medical community retained its capacity as a legitimate epistemic challenger and forced the state to institutionalize a space for medical co-existence. Groups assigned the status of non-scientific Other are not passive recipients of exclusion; they can contest, survive, and ultimately refashion the boundaries imposed upon them. Moreover, this resistance was not merely defensive; in the process of contesting exclusion, the Chinese medical community began to articulate new understandings of both what science could mean and what their own tradition essentially was—a dual reconceptualization that would fully unfold in the third moment. The third moment concerns the active pursuit of epistemic reconciliation. Moving beyond defensive resistance, the Chinese medical community initiated the “Making Chinese Medicine Scientific” movement in the early 1930s. By actively seeking to articulate connections between traditional epistemologies and scientific frameworks, these practitioners refused their assigned status as the non-scientific Other and demonstrated that a marginalized group could possess the agency to redefine

the domain of science itself while simultaneously reconceptualizing the boundaries and content of their own knowledge tradition. Neither the meaning of "science" nor the meaning of "Chinese medicine" remained fixed through this process; both were actively reconstructed as practitioners sought viable pathways across epistemic boundaries.

Taken together, these three moments reveal a pattern that boundary-work, in its current formulation, cannot theorize: epistemic boundary-making is an asymmetric process in which structurally unequal actors engage in ongoing negotiation, where subaltern resistance does not merely contest exclusion but actively refashions the very terms upon which scientific legitimacy is defined. To capture this dynamic—and to restore analytical visibility to the marginalized group's perspective, strategies, and outcomes—a new concept is required.

Boundary-crossing work:

In this article, I introduce the concept of “boundary-crossing work” to capture a distinct mode of epistemic struggle that has been obscured by the dominant-centric perspective of boundary-work. By “boundary-crossing work,” I refer to the strategic practices through which marginalized epistemic groups challenge their exclusion from science by simultaneously reconstructing the epistemological criteria of science and reconceptualizing the boundaries and content of their own knowledge system. These two operations are mutually constitutive: each redefinition of what counts as “scientific” entails a corresponding vision of which elements of the marginalized knowledge are worth preserving, transforming, or discarding; conversely, each judgment about what constitutes the essential core of the marginalized tradition shapes what definition of science the group finds plausible or desirable. Boundary-crossing work, in this sense, is not a one-sided assault on the dominant group's epistemic fortress but a dual reconstruction that transforms both sides of the boundary simultaneously. This concept builds upon yet fundamentally departs from Gieryn's boundary-work in three critical ways. First, it shifts analytical attention from dominant groups' practices of exclusion to marginalized groups' agency in reshaping epistemic boundaries—not merely as contestation from below, but as active reconceptualization of both the field they seek to enter and the tradition they carry with them. Second, it reveals that the boundaries of science are negotiated not only through exclusion (as boundary-work emphasizes) but also through processes of dual redefinition initiated by those previously excluded—processes that simultaneously reshape what “science” means and what the marginalized knowledge “is.” Third, it challenges the zero-sum assumption by demonstrating how epistemic coexistence can emerge as a stable, albeit contested, outcome—precisely because multiple dual redefinitions can coexist without any single one achieving monopoly. Most importantly, boundary-crossing work is a sensitizing concept that “gives the user a general sense of reference and guidance in approaching empirical instances” (Blumer 1954, 7), which leads us to a different set of theoretical questions: How do marginalized groups challenge and reconstruct those boundaries? How do multiple forms of epistemic authority coexist? Who gets to define what science means? How their divergent attempts defining science reshape their understandings of Chinese medicine?

The core mechanism of boundary-crossing work is dual redefinition: marginalized groups simultaneously reconstruct the criteria of science and reconceptualize the content and boundaries of their own knowledge system. On one side, they refuse to accept dominant groups' criteria as the sole legitimate definition of science, proposing alternative understandings of what science is and what makes knowledge scientific. On the other, they reinterpret

their own tradition in light of their chosen definition of science—deciding which elements constitute its essential core, which are dispensable, and which must be transformed to achieve scientific legitimacy. These two operations cannot proceed independently: a group's definition of science determines what counts as the valuable or defensible core of its knowledge, while its commitments to particular elements of its tradition shape what definition of science it finds plausible or strategically viable. However, there is no unified consensus within marginalized communities about how either redefinition should proceed. From a position of exclusion, it remains unclear which definition of science will be most effective in securing epistemic legitimacy, which aspects of the marginalized knowledge system are worth defending, and what costs of compromise are acceptable. This strategic uncertainty generates multiple competing dual redefinitions within the same marginalized community—each pairing a distinct vision of science with a corresponding reconceptualization of the tradition itself.

These multiple competing dual redefinitions generate what I call dual pluralization: within the field of science and within the marginalized group itself. Because each faction pairs a distinct definition of science with a corresponding reconceptualization of the marginalized knowledge, the result is not merely a plurality of views about science but a simultaneous plurality of views about the tradition. The marginalized knowledge system is no longer experienced or understood as a unified entity; it fractures into divergent versions of itself, each shaped by the particular definition of science its proponents have adopted. For instance, some may prioritize immediate institutional recognition and thus align more closely with dominant criteria; others may resist assimilation and emphasize the distinctive value of their knowledge system; still others may seek middle paths that preserve core elements while accommodating some dominant standards. This process of differentiation profoundly shapes and pluralizes their interpretations of the marginalized knowledge and challenges the zero-sum logic of boundary-work. The outcome is not a single victor claiming the mantle of science, but rather the coexistence of multiple approaches within both the marginalized community and the broader field of science.

The “Making Chinese Medicine Scientific” movement vividly illustrates this dynamic. Facing exclusion from state-sanctioned science, Chinese medical practitioners collectively engaged in boundary-crossing work by challenging Western medicine’s monopoly on defining science. However, the community fragmented into three distinct groups, each proposing a different answer to the question “What is science in medicine?” Pragmatists defined science as therapeutic efficacy, arguing that if Chinese medicine could cure patients, it was scientific regardless of its theoretical foundations. Westernizers redefined science in strictly positivist terms—as the observation and analysis of material phenomena through experimental verification—and correspondingly reconceptualized Chinese medicine as a repository of empirical therapies and *materia medica* whose value could only be established through biomedical validation. Rationalists defined science as internal theoretical coherence, arguing that systematic reasoning and logical consistency—not conformity to Western methods—constituted scientific rigor. These three definitions were not arbitrary variations but reflected fundamentally different strategic orientations: Pragmatists prioritized preserving clinical practices while being willing to abandon theory. Westernizers redefined science as material observation and experimental verification, and correspondingly reconceptualized Chinese medicine not as an integrated theoretical system but as a collection of empirical therapies and *materia medica* that could survive biomedical scrutiny once stripped of their cosmological and philosophical

frameworks. Their dual redefinition was the most radical of the three: by narrowing the definition of science to strict positivism, they justified the wholesale excision of Chinese medical theory; by reducing Chinese medicine to its empirical residue, they made the positivist standard appear achievable. Rationalists prioritized theoretical autonomy and resisted Western frameworks. Each approach embodied different judgments about what made Chinese medicine valuable, what relationship with Western medicine was desirable, and what forms of scientific legitimacy were achievable.

Method

During the Republican period (1912–1949), medical periodicals emerged as a central arena for epistemic contestation among Chinese medicine practitioners. Prior to that, these practitioners transmit their thoughts by medical cases and medical talks. However, this kind of knowledge transmission implies an uneven direction that only important or famous practitioners were able to transfer their thoughts to others. Facing the pressure from Western practitioner in modern period, unlike formal institutional channels that were largely dominated by biomedical professionals and state actors, Chinese medicine practitioners began to build medical periodicals as a discursive space in which they could articulate, debate, and refine their responses to the mounting pressure of their competitors. In this sense, those medical periodicals were not merely records of intellectual activity but became the platforms across locations.

The primary sources were retrieved from the Compilation of Chinese Medicine Periodicals Online (1897–1952) and the Chinese Periodical Full-text Database (1911–1949). I traced the “Making Chinese Medicine Scientific” movement through three key terms that Chinese medicine practitioners themselves used to frame the movement: making scientific (*kexuehua*), making Chinese medicine scientific (*zhongyi kexuehua*), and making national medicine scientific (*guoyi kexuehua*). The variation among these terms is itself analytically significant: the shift from Chinese medicine to national medicine reflects competing strategies for claiming political legitimacy within the broader framework of nation-building. To capture the full range of epistemic positions, I supplemented the database search with materials that marked critical turning points or boundary-crossing moments: the two special issues of *Chinese-Western Medicine* dedicated to the “Debates around Making Chinese Medicine Scientific,” which crystallized the central points of the movement; extended polemical exchanges between key figures such as Tan Cizhong, Zhou Sha, Fan Xingzhun, He Jiamou, and Song Daren, which reveal the internal heterogeneity of boundary-crossing strategies; and Chinese translations of writings by the Japanese Kampo practitioner Watanabe Hiroshi, whose arguments were mobilized by Chinese medicine practitioners to demonstrate that the scientification of traditional medicine was not a uniquely Chinese predicament but part of a broader East Asian epistemic politics.

Following the methodological insight of Jeffrey Haydu’s problem solving model and its application (Haydu 1998, 2010), I traced how different practitioners of Chinese medicine answered the essential question, “how to make Chinese medicine scientific”, in their attempts to cross the boundary established by biomedical professionals. Through iterative close reading, I surprisingly found that the reiterated responses to the same question do not necessarily lead to the formation of a single medical epistemology as Daniel Navon (2024) illustrates, but prompts to diversify the relationship between Chinese medicine and science. Constantly comparing this empirical finding with STS literature encouraged me to inquire theoretical limits of the concept boundary-work and further theorize

the epistemic practices of marginalized groups. Finally, I have divided the seemingly unified community of Chinese medicine practitioners into three categories based on their differing responses to this question: Pragmatists, Westernizers, and Rationalists and analyzed how dual redefinition operated within those three groups.

Boundary-crossing Work: Bridging Chinese Medicine with Science

Pragmatists: Therapeutic Efficacy as the Criterion of Science

For Pragmatists, boundary-crossing work operated through a distinctive dual redefinition. On one side, they redefined the criterion of science itself: science, in their view, was not a matter of theoretical frameworks or experimental methods but of therapeutic efficacy—the demonstrated ability to cure disease. On the other side, they correspondingly reconceptualized Chinese medicine: no longer an integrated cosmological system anchored in Yin-Yang, Five Phases, and Qi transformation, but a cumulative empirical tradition built upon millennia of clinical practice and trial-and-error refinement. These two operations were mutually constitutive: only by redefining science as efficacy could Chinese medicine's vast clinical record be recognized as scientific evidence; and only by recasting Chinese medicine as an empirical tradition could the efficacy standard appear both natural and sufficient. Crucially, this reconceptualization of Chinese medicine was not an inherent self-understanding of the tradition. For millennia, medical development in China had been driven more by theoretical innovation than by systematic attention to therapeutic outcomes (Hsu 2001, 173–92; Wu 2010). It was only after Western medicine's institutional challenge that practitioners began to frame medical experience (*jingyan*) as the essence of their tradition (Lei 2002)—a reframing that was itself an act of boundary-crossing work.

This dual redefinition rested on three interlocking claims that collectively constructed both a new criterion of science and a new image of Chinese medicine. Pragmatists equated science with the systematic organization of empirical facts and treated successful treatment as the ultimate empirical fact. As Xi Kejie argued, "Science consists in the systematic organization of empirical facts, while the cure of disease represents the manifestation of such facts. The ability to heal thus demonstrates the realization of science."⁵ This formulation accomplished a critical epistemic move: it detached science from any specific methodology—anatomy, laboratory experimentation, germ theory—and re-anchored it in clinical outcomes, a domain where Chinese medicine could claim millennia of accumulated evidence. Besides, Pragmatists insisted that therapeutic efficacy was not accidental but depended on the disciplined application of specialized medical knowledge. As Ling Shuren contended, "medicines themselves are inert; their effectiveness depends on the practitioners' skillful application. Without sound medical knowledge to direct the use of drugs and remedies, from where could their therapeutic efficacy arise?"⁶ This claim simultaneously elevated Chinese medicine from folk practice to systematic expertise: if efficacy required expert knowledge, then the tradition that produced effective practitioners must itself be a rigorous knowledge system. Finally, the long historical continuity of Chinese medicine was treated as cumulative empirical validation. As Song Airen argued, "If national medicine lacked real therapeutic effectiveness, it would long since have been abandoned by the people."⁷ Historical

⁵ Xi Kejie, "An Understanding of Science" (*Kexue zhi renshi*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-435.

⁶ Ling Shuren, "Making Chinese Medicine Scientific and Modernization" (*Zhongyi kexuehua yu xiandaihua*), *Xiandai zhongyi* (Modern Chinese Medicine), January 18, 1934, CCMPO no. 4-42-57.

⁷ Song Airen, "Science Is Insufficient to Determine the Abolition or Preservation of Chinese Medicine" (*Kexue buzu cunfei zhongyi lun*), *Yijie chungiu* (Annals of the Medical World), December 15, 1933, CCMPO no. 3-10-421.

survival, in this reasoning, functioned as a large-scale, long-duration experiment—a form of evidence that Western medicine, with barely a century of clinical application in China, could not match. Together, these three claims constructed Chinese medicine as precisely the kind of knowledge that their redefined science valued most: empirically grounded, clinically validated, and historically tested.

Once therapeutic efficacy was established as the criterion of science, it became possible to challenge the previously stable equation between Western medicine and scientific authority. Since the mid-nineteenth century, Chinese intellectuals had widely equated Western medicine's scientific legitimacy with its anatomical and surgical practices (Ma et al. 2026). Pragmatists systematically dismantled this equation. Their most rhetorically effective strategy was deploying the testimony of Watanabe Hiroshi, a Japanese physician who had obtained a medical doctorate in Germany. As Zeng Juesou reported, Watanabe himself acknowledged that “the certificate in experimental science he earned during his studies in Germany amounted to little more than a diploma, of no practical value in curing disease.”⁸ This insider critique was strategically powerful: a reformist trained at the foremost center of modern medical science had concluded that experimental credentials did not translate into therapeutic competence. Gu Tisheng pushed the argument further by directly attacking anatomy as a criterion of science, arguing that “if dissecting corpses is taken as science... such way of making medicine scientific differs little from turning the living into the dead.”⁹ In his view, anatomical knowledge was fundamentally detached from clinical healing, reducing the patient from a living subject to a cadaver. Through these moves, Pragmatists accomplished a critical step in their dual redefinition. By severing the link between Western medicine's institutional markers—laboratory credentials, anatomical knowledge, experimental training—and the actual capacity to heal, they simultaneously destabilized Western medicine's monopoly on the definition of science and cleared the epistemological ground for Chinese medicine's clinical record to serve as an alternative foundation for scientific legitimacy. The two operations were inseparable: Western medicine could only be dethroned as the embodiment of science if science was redefined as efficacy, and Chinese medicine could only be enthroned as scientific if its clinical tradition was reconceptualized as the relevant form of evidence.

The redefinition of science as therapeutic efficacy did not merely validate Chinese medicine's existing practices; it actively reshaped which elements of the tradition Pragmatists foregrounded as its essential core. Two features were elevated to defining status: medical holism and the treatment of emotional states. Neither feature was new to Chinese medicine, but their promotion to the center of the tradition's identity was itself an act of reconceptualization—driven by the logic of the Pragmatists' redefined science. If science meant effective healing, then the aspects of Chinese medicine that most distinguished its therapeutic approach from Western medicine's became its strongest scientific credentials. Western medicine, Pragmatists argued, was “almost entirely constructed upon localized material forms,” reducing disease to the presence of bacteria and treating the body as a collection of

⁸ Zeng Juesou, "Chinese Medicine Need Not Be Scientificized" (*Zhongyi wuxu kexuehua*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPPO no. 5-10-431.

⁹ Gu Tisheng, "A Critique of Making Chinese Medicine Scientific" (*Zhongyi kexuehua zhi shangdui*), *Yijie chunqiu* (Annals of the Medical World), no. 44, February 10, 1930, CCMPPO no. 3-7-195.

discrete parts rather than an integrated organism. Chinese medicine, by contrast, approached the patient holistically — “categorizing conditions into patterns of cold, heat, deficiency, and excess, thereby restoring the body’s natural functions.”¹⁰ When efficacy rather than method was taken as the standard of science, holistic treatment was not a deficiency but an advantage: it addressed “root causes” rather than isolated symptoms. This holistic orientation extended to the domain of emotions. In the Chinese medical tradition, emotional imbalance is understood as a direct cause of somatic disease; treatment therefore requires attending to the patient’s psychological and spiritual condition (Zhang 2007; Karchmer 2013). Western medicine, grounded in “anatomical structures and fixed lesions, reductive causality, and mechanical influence”(Zhang 2007, 79–80), dismissed this approach as unscientific, insisting that “a physical pain must be accompanied with a physical cause” (Zhang 2007, 34). Pragmatists challenged this dismissal by expanding the definition of science itself. Xi Kejie proposed a distinction between “material science” (*wuzhi kexue*) and “spiritual science” (*jingshen kexue*), arguing that Chinese medicine has attained one part of the science of the spirit, while Western medicine has attained one part of the science of matter.¹¹ More importantly, this distinction between “material science” and “spiritual science” was not merely a defensive taxonomy; it was a dual boundary-crossing move. By expanding the definition of science to include the “spiritual” domain, Pragmatists enlarged the territory of legitimate science itself; by identifying Chinese medicine as the tradition that had developed this spiritual science, they simultaneously reconceptualized their tradition as the bearer of a form of scientific knowledge that Western medicine structurally lacked.

Some Pragmatists pushed the dual redefinition to its most radical form. Gu Tisheng proposed a tripartite classification of knowledge: theology, which privileged emotion; science, which privileged knowledge of the material world; and philosophy, which integrated both.¹² Chinese medicine, in his view, occupied this philosophical position precisely because it attended simultaneously to the material body and the spiritual condition of the patient. Crucially, Gu did not present this as a concession—as if Chinese medicine fell short of science and could only claim the interior position of philosophy, as Westernizer assumed. Rather, he inverted the hierarchy: philosophy, as the integration of knowledge and emotion, was epistemologically superior to science, which remained confined to the material plane alone. Chinese medicine, far from needing to shed its philosophical character to become scientific, was already operating at a higher epistemic level. This move represents the most audacious version of the Pragmatists’ dual redefinition: science itself was redefined as merely one component of a larger epistemic landscape, while Chinese medicine was reconceptualized as the tradition that had achieved what science alone could not—the integration of material and spiritual knowledge. The boundary Pragmatists sought to cross was not merely the line between science and non-science; it was the very hierarchy that placed science at the apex of legitimate knowledge.

¹⁰ Fang Yaozhong, “The Greatest Crisis Facing Chinese Medicine Today: The So-Called Making Chinese Medicine Scientific, with Brief Remarks on the Essence of Chinese Medicine” (*Muqian zhongyijie yige zuida de weiji: yiban suowei de zhongyi kexuehua, bing lüeshuo Zhongguo yiyao zhi jingyi*), *Zhongguo yiyao yuekan* (Chinese Medicine Monthly, Chongqing), vol. 1, no. 5, 1944, pp. 7–9. Source: Chinese Periodical Full-text Database (CPFTD).

¹¹ Xi Kejie, “An Understanding of Science” (*Kexue zhi renshi*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-435.

¹² Gu Tisheng, “A Critique of Making Chinese Medicine Scientific” (*Zhongyi kexuehua zhi shangdui*), *Yijie chunqiu* (Annals of the Medical World), no. 44, February 10, 1930, CCMPO no. 3-7-195.

The Pragmatists' dual redefinition—science as therapeutic efficacy, Chinese medicine as cumulative clinical tradition—generated a coherent set of practical orientations that reveal how boundary-crossing work translates from epistemological argument into concrete strategy. Each orientation simultaneously enacted both redefinitions: judgments about what to preserve or discard in Chinese medicine were inseparable from judgments about what science required or permitted.

These epistemological commitments above translated into a distinctive set of practical orientations that reveal the specific form boundary-crossing work took for this group. Pragmatists vehemently opposed the Westernization of Chinese medicine. Wang Xianmin insisted that “making national medicine scientific does not require the complete abandonment of its inherent traditional theories, nor does it necessitate a forced integration of Chinese and Western doctrines.”¹³ This opposition was directed not only at Western medicine practitioners but also at fellow Chinese medicine practitioners who embraced biomedical frameworks. Fang Yaozhong sharply criticized those within the Chinese medical community who “insisted on wearing a Western suit over a Chinese gown”—attempting to identify pathogens by using Western pathology first and then apply Chinese medicinal treatments, while “kicking Chinese medical theory aside entirely.”¹⁴ This intra-community polemic reveals that boundary-crossing work generated not only external contestation with Western medicine but also internal conflict among Chinese medicine practitioners. Fang's critique was directed specifically at those who accepted Western biomedicine's definition of science and then attempted to fit Chinese therapies into that framework—precisely the strategy that, as the next section shows, the Westernizers would systematically pursue. For Pragmatists, this approach was doubly mistaken: it conceded the definition of science to the dominant group, and it dismembered Chinese medicine by separating its therapies from its theoretical logic.

Meanwhile, Pragmatists applied their efficacy-based criterion to Chinese medical theory itself, selectively retaining what served clinical practice and discarding what did not. Ling Shuren characterized the *Treatise on Cold Damage* as a text that “discussed disease and prescribed drugs without any admixture of Yin-Yang or Five Phases”—a reading that was itself an act of reconceptualization.¹⁵ Although that the *Treatise* is deeply embedded in classical cosmological frameworks; Ling's insistence on reading it as a purely clinical document required actively filtering out its theoretical dimensions to render it compatible with the Pragmatist redefinition of Chinese medicine as empirical practice. This selective appropriation reveals that redefining Chinese medicine was not simply a matter of choosing which texts to keep; it also involved reinterpreting the retained texts to align with the new epistemic identity.

Crucially, Pragmatists did not categorically reject Western medical knowledge; rather, they subordinated it to the Chinese medical framework. Zeng Luxiu proposed a program in which practitioners would study the *Inner*

¹³ Wang Xianmin, “Prerequisites for Making National Medicine Scientific” (*Guoyi kexuehua zhi xianjue wenti*), *Xin zhongyi kan* (New Chinese Medicine Journal), July 1, 1941, CCMPO no. 5-20-578.

¹⁴ Fang Yaozhong, “The Greatest Crisis Facing Chinese Medicine Today: The So-Called Making Chinese Medicine Scientific, with Brief Remarks on the Essence of Chinese Medicine” (*Muqian zhongyijie yige zuida de wei ji: yiban suowei de zhongyi kexuehua, bing lüeshuo Zhongguo yiyao zhi jingyi*), *Zhongguo yiyao yuekan* (Chinese Medicine Monthly, Chongqing), vol. 1, no. 5, 1944, pp. 7–9. Source: Chinese Periodical Full-text Database (CPFTD).

¹⁵ Ling Shuren, “Making Chinese Medicine Scientific and Modernization” (*Zhongyi kexuehua yu xiandaihua*), *Xiandai zhongyi* (Modern Chinese Medicine), January 18, 1934, CCMPO no. 4-42-57.

Canon alongside physiology and pathology, and *the Classic of Materia Medica* alongside botany and chemistry. The epistemic hierarchy was clear: Western sciences served as supplementary references, not as foundational frameworks. Zeng illustrated this through the case of ginseng—Western chemical analysis concluded that it merely aided digestion, but from a Chinese medical perspective, harmonizing the stomach was precisely the mechanism through which ginseng could “nourish the five viscera and settle the spirit,” a holistic interpretation that reductive chemical analysis could not capture.¹⁶ The implication was not that Western pharmacology was wrong, but that it was incomplete: a truly scientific understanding of ginseng, as he assumed, required the integrative framework that Chinese medicine provided.

Third, these commitments led Pragmatists to advocate a fundamentally archival and compilatory approach to “making Chinese medicine scientific.” Rather than theoretical reformulation or experimental validation, the task was to organize, collate, and systematize the vast body of existing clinical experience. As Wang Xianmin urged, “the writings of past sages in national medicine are overwhelmingly voluminous, while effective folk remedies are widely scattered... We must apply meticulous organization and precise collation to these myriad texts.”¹⁷ The remarkable historical continuity of this approach merits note: following the Civil War, the socialist government launched a nationwide “donating prescriptions” movement (*xianfang yundong*), urging practitioners to compile and share their effective clinical formulas—an institutional appropriation of the Pragmatist strategy that suggests their redefinition of science proved to be the most politically legible and administratively actionable of the three approaches (Ruixian and Wei 2009; Taylor 2011, 168; Hechun et al. 2024).

Westernizers: Biomedicine as “Obligatory Passage Point”

Westernizers pursued the most radical form of dual redefinition among the three groups. On one side, they redefined science in strictly positivist terms: science was the observation and analysis of material phenomena through experimental methods, following a progressive trajectory from religion through philosophy to science. As Tan Cizhong argued, the history of world medicine followed an inexorable progression “from religion to philosophy, from philosophy to science, in accordance with the order of evolution”¹⁸; Chinese medicine, insofar as it remained entangled with philosophical reasoning, was trapped at a stage that history had already surpassed. On the other side, they correspondingly reconceptualized Chinese medicine itself—not as an integrated theoretical system but as a repository of empirical therapies and materia medica buried beneath layers of metaphysical speculation that must be removed.

These two operations were mutually constitutive: only by narrowing science to material verifiability could they justify the wholesale excision of Chinese medical theory; and only by reducing Chinese medicine to its empirical residue could they claim that it was capable of meeting positivist standards. In effect, Western biomedical

¹⁶ Zeng Luxiu, “On Making Chinese Medicine Scientific” (*Lun zhongyi kexuehua*), *Guangdong yiyao xunkan* (Guangdong Medicine Ten-Day Journal), vol. 1, no. 4, 1941, pp. 4–5. Source: CPFTD.

¹⁷ Ling Shuren, “Making Chinese Medicine Scientific and Modernization” (*Zhongyi kexuehua yu xiandaihua*), *Xiandai zhongyi* (Modern Chinese Medicine), January 18, 1934, CCMPO no. 4-42-57.

¹⁸ Tan Cizhong, “A Discussion on Making Chinese Medicine Scientific” (*Zhongyi kexuehua zhi shangque*), *Shehui yibao* (The Public Health and Medical Journal), no. 148, 1931, pp. 2203–2205. Source: CPFTD.

frameworks became what Michel Callon (Callon 1984) terms an “obligatory passage point”—a strategic node through which all medical knowledge had to pass to acquire scientific legitimacy. But the passage was not free: to cross this point, Chinese medicine had to be fundamentally reconstituted, stripped of the cosmological and philosophical frameworks that had defined it for millennia. As Ding Fubao diagnosed the situation, traditional practitioners were “systematically excluded from institutional representation” precisely because they lacked knowledge of foundational biomedical sciences; the exclusion was not merely institutional but epistemic—without mastering Western medical frameworks, practitioners could not even participate in discussions of etiology, symptoms, or pathology. Even at the everyday level of joint consultations at a patient's bedside, “only Western medical theories could be articulated, while the traditional practitioner could not contribute a single word.”¹⁹ For Westernizers, this practical silencing confirmed that Western biomedicine constituted the non-negotiable gateway to scientific status.

The first dimension of the Westernizers' dual redefinition concerned the meaning of science itself. For this group, science was strictly equated with the observation and analysis of material phenomena—the study of physical properties, causal mechanisms, and experimentally verifiable relationships. As Tan Cizhong articulated, “Science values objectivity and relies on experimentation, operating on the principle that force and matter are inseparable... The factual, causal link between force and matter—when substantiated by evidence, is called science; without evidence, it is merely philosophy.” The demarcation between science and philosophy, Tan insisted, “lies entirely in the presence or absence of material form”: where there was no observable matter, there could be no basis for inquiry, only speculation.²⁰ The consequences of remaining at the philosophical stage were not merely theoretical but practically debilitating: “the longer this continues, the more disputes multiply, until the result is merely ‘this side says one thing, that side says another.’ Though reforms are attempted repeatedly, nothing improves; though steps are taken, there is no progress.”²¹ Philosophy, in this account, was not simply pre-scientific but anti-progressive—it trapped Chinese medicine in an endless cycle of irresolvable disagreement, the very antithesis of the cumulative advancement that defined science. This strict materialism constituted a direct challenge to the Pragmatists' dual redefinition. Where Pragmatists had expanded the boundaries of science to include a “spiritual science” (*jingshen kexue*) and had reconceptualized Chinese medicine as a tradition uniquely attuned to the emotional and spiritual dimensions of illness, Westernizers countered that any causal claim about disease—including the influence of emotions on the body—must be demonstrable at the material level. The issue was not whether emotions affected health, but whether such effects could be observed, measured, and experimentally verified. For Westernizers, the Pragmatists' “spiritual medicine” failed precisely this test: it invoked forces without matter, causes without observable mechanisms. This was not merely a disagreement about Chinese medicine's strengths; it was a

¹⁹ Ding Fubao, “My Views on Making National Medicine Scientific” (*Guoyi kexuehua zhi wo jian*), *Fuxing zhongyi* (Journal of New Chinese Medicine), no. 12, November 1942, CCMPO no. 5-31-679.

²⁰ Tan Cizhong and Xue Yucheng, “On the Necessity of Making Chinese Medicine Scientific” (*Lun zhongyi kexuehua zhi biyao*), *Zhongyi kexue* (Chinese Medicine Science), vol. 1, no. 8, 1937, pp. 443–445. Source: CPFTD.

²¹ Tan Cizhong and Xue Yucheng, “On the Necessity of Making Chinese Medicine Scientific” (*Lun zhongyi kexuehua zhi biyao*), *Zhongyi kexue* (Chinese Medicine Science), vol. 1, no. 8, 1937, pp. 443–445. Source: CPFTD.

fundamental conflict between two competing redefinitions of science, each of which entailed a radically different vision of what Chinese medicine could legitimately claim to be.

The positivist redefinition of science entailed a correspondingly radical reconceptualization of Chinese medicine. If science required material observability and experimental verification, then the entire theoretical edifice of Chinese medicine—Qi transformation, Yin-Yang, Five Phases, the functional theory of the viscera—fell outside the boundaries of legitimate knowledge. Westernizers did not merely criticize these theories as imprecise; they categorically rejected them as belonging to a superseded epistemic stage. Lu Yuanlei's rejection of Qi transformation was framed not as a simple empirical judgment but as a logical ultimatum: "Unless the invalidity of anatomy can be thoroughly proven, Qi transformation and anatomy cannot logically coexist... Even if anatomy and science were both proven wrong, the philosophical doctrine of Qi lacks empirical experimentation to verify its truth; therefore, it still cannot stand on its own."²² The argumentative structure is revealing: Lu shifted the burden of proof entirely onto defenders of Qi theory, demanding that they either falsify anatomy or produce experimental evidence for Qi—a standard that traditional methods could not meet by definition. Tan Cizhong pushed the critique further, mocking the abstract nature of traditional diagnoses: attributing dizziness to "Wind" or indigestion to "Dampness" was, in his view, merely a cover for anatomical ignorance. As he said, "the failure of Chinese medicine to accurately identify the specific pathological locus of a disease is, in fact, a primary reason it has gradually lost the sympathy of the public." When defenders invoked clinical efficacy, Tan dismissed this as a category error: "facts and theories do not necessarily stand in a causal relationship"²³—a treatment might cure a disease for reasons entirely unrelated to the theoretical framework invoked to explain its action. This distinction between empirical correlation and theoretical causation struck at the heart of the Pragmatists' dual redefinition: if clinical success could not serve as evidence for theoretical validity, then the entire project of legitimizing Chinese medical theory through therapeutic outcomes collapsed. Not all Westernizers, however, advocated complete theoretical demolition. Ye Juquan, while rejecting the overarching framework of Qi transformation, proposed retaining six diagnostic categories from the Eight Principles—deficiency, excess, cold, heat, exterior, and interior—reinterpreted not as expressions of Qi dynamics but as "indicators of the body's natural resistance to disease."²⁴ This operation was epistemic translation: traditional diagnostic terms were severed from their cosmological moorings and re-anchored in a biomedical idiom approximating immunological concepts. The divergence between Lu Yuanlei's categorical rejection and Ye's selective translation reveals that even within the Westernizers' camp, the reconceptualization of Chinese medicine was internally contested: how much of the tradition could survive the passage through the positivist gate remained an open question.

If the Westernizers' reconceptualization of Chinese medicine was destructive in its theoretical dimension—excising Qi transformation, Yin-Yang, and Five Phases—it was constructive in its empirical dimension. Having

²² Lu Yuanlei, "Draft Outline for the Reorganization of National Medicine" (*Guoyi xueshu zhengli dagang cao'an*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-454.

²³ Tan Cizhong, "On the Inevitable Demise of National Medicine without Scientification, with a Brief Outline of Methods for Scientific Reorganization" (*Lun guoyi fei kexuehua ze bi wang ji luejü kexue zhengli zhi fangfa*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-467.

²⁴ Ye Juquan, "Fallacies of Making National Medicine Scientific" (*Guoyiyao kexuehua de miujian*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-486.

stripped Chinese medicine of its theoretical shell, Westernizers sought to salvage what remained: clinical experience, therapeutic techniques, and materia medica. The question was no longer “Is Chinese medical theory scientific?” but “Can Chinese medicine’s empirical residue survive biomedical validation?” Tan Cizhong crystallized this epistemic surgery in a tripartite classification of the Chinese medical canon: the *Yellow Emperor’s Inner Canon* represented “metaphysical theory”, the *Divine Farmer’s Classic of Materia Medica* represented “materia medica,” and the *Treatise* represented “clinical experience.”²⁵ This taxonomy dismembered the classical canon not along chronological lines but along epistemological ones, sorting its components into what must be discarded (metaphysical theory), what could be pharmacologically tested (materia medica), and what constituted credible empirical records (clinical experience). Lu Yuanlei reinforced this logic with a historical periodization: texts predating the Northern Song dynasty (960–1127) “recorded empirical facts more faithfully,” while the metaphysical speculations introduced from the Jin-Yuan period onward had “no utility in curing disease” and must be “excised.”²⁶ Together, these classificatory and periodizing strategies provided Westernizers with a method for performing the operation—salvaging the empirical core of Chinese medicine by removing its theoretical shell.

This logic of epistemic decoupling extended to specific domains of practice. In materia medica, Westernizers argued that herbs must be detached from the theoretical framework that had traditionally governed their classification—the correspondence between a patient’s condition (cold, heat, deficiency, excess) and an herb’s properties—and re-examined through Western pharmacological methods. Ye Juquan pointed to Japan as a concrete model: Japanese pharmacologists had extracted clinically significant compounds—including cardiac and diuretic agents—from traditional herbal formulas, demonstrating that the therapeutic value of materia medica could be validated through biomedical methods without reference to the theoretical systems that originally prescribed them.²⁷ Fan Shouyuan stated the implication bluntly: Chinese medical theories were impossible to render scientific; the only thing worth preserving was the herbs themselves.²⁸ In acupuncture, Chen Tonghou argued that the technique demonstrably produced superior clinical results, yet remained burdened by “the abstruse doctrines of yunqi and meridians.” “If these doctrines are not removed,” Chen warned, “people will continue to denounce it as unscientific.”²⁹ The obstacle to scientific recognition was not the practice but the theory attached to it. Consequently, Westernizers argued that practitioners could only be qualified to evaluate ancient therapies if they possessed a thorough understanding of Western medical theory. As Ding Fubao declared, “once the mind has been scientificized, one can immediately judge the truth or falsehood of our ancient medical texts.”³⁰ Chen Tonghou pushed this to its

²⁵ Tan Cizhong, “A Discussion on Making Chinese Medicine Scientific” (*Zhongyi kexuehua zhi shangque*), *Shehui yibao* (The Public Health and Medical Journal), no. 148, 1931, pp. 2203–2205. Source: CPFTD.

²⁶ Lu Yuanlei, “Draft Outline for the Reorganization of National Medicine” (*Guoyi xueshu zhengli dagang cao'an*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-454.

²⁷ Ye Juquan, “Fallacies of Making National Medicine Scientific” (*Guoyiyao kexuehua de miujian*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-486.

²⁸ Fan Shouyuan, “The Problem of Making Old Chinese Medicine Scientific” (*Zhongguo jiujiyao de kexuehua wenti*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 3, March 1936, CCMPO no. 5-10-547.

²⁹ Chen Tonghou, “On Making Chinese Medicine Scientific (Editorial)” (*Lun zhongyi kexuehua (juantouyan)*), *Nanhui yixue yuekan* (Nanhui Medical Monthly), vol. 2, no. 12, 1949, p. cover 1. Source: CPFTD.

³⁰ Ding Fubao, “My Views on Making National Medicine Scientific” (*Guoyi kexuehua zhi wo jian*), *Fuxing zhongyi* (Journal of New Chinese Medicine), no. 12, November 1942, CCMPO no. 5-31-679.

logical extreme: "whenever the theoretical reasoning of the ancients contradicts modern physiology, it must be excised—even if it comes from the Yellow Emperor or Zhang Zhongjing."³¹ The implication was clear: the authority to interpret the Chinese medical tradition now required mastery of a foreign epistemic framework. The Westernizers' dual redefinition had produced a paradoxical outcome: to be a competent practitioner of Chinese medicine, one first had to become a disciple of Western medicine.

This epistemological radicalism also carried institutional consequences: Westernizers explicitly opposed the strategy of building institutional infrastructure—medical schools, professional associations, journals—before the epistemological transformation of Chinese medicine was complete. As Ye Juquan dismissed, despite a decade of institution-building, Chinese medicine had “still nothing to show for it.”³² The full significance of this institutional stance, however, only becomes apparent in contrast with the Rationalists' radically different approach to the same question.

The Westernizers' boundary-crossing work thus operated through the most asymmetric form of dual redefinition among the three groups. By redefining science in strictly positivist terms—as material observation, experimental verification, and cumulative progress—they established Western biomedicine as the singular gateway to scientific legitimacy. By correspondingly reconceptualizing Chinese medicine as a repository of empirical therapies and materia medica buried beneath dispensable metaphysical theory, they made the passage through this gateway appear both necessary and achievable. Ye Juquan's candid statement—“to become scientific is to become Westernized”—was not a concession of failure but the logical conclusion of this dual redefinition.³³ Yet the Westernizers' position harbored a structural paradox that distinguished their boundary-crossing from that of the other two groups. Their dual redefinition was designed to bring Chinese medicine across the boundary into science, but the price of crossing was the dissolution of what made Chinese medicine a distinctive epistemic system. The theoretical frameworks that had organized diagnosis, treatment, and pharmacology into a coherent whole—Qi transformation, Yin-Yang, Five Phases—were precisely what had to be excised. What survived the passage—herbs validated by pharmacological analysis; techniques stripped of their theoretical rationale—no longer constituted “Chinese medicine” in any epistemologically meaningful sense.

Rationalists: Medicine is reasoning

The third epistemic group pursued a dual redefinition that diverged sharply from both Pragmatists and Westernizers. On one side, Rationalists redefined science as the internal consistency and systematic coherence of a theoretical framework. As He Peiyu argued, “The meaning of the term 'science' lies in establishing a particular doctrine based on a certain understanding. When the principles that run through it remain consistent, coherent, and firmly unchanging, it constitutes a particular science.”³⁴ Science, under this definition, was neither therapeutic efficacy (as

³¹ Chen Tonghou, "On Making Chinese Medicine Scientific (Editorial)" (*Lun zhongyi kexuehua (juantouyan)*), *Nanhui yixue yuekan* (Nanhui Medical Monthly), vol. 2, no. 12, 1949, p. cover 1. Source: CPFTD.

³² Ye Juquan, "Fallacies of Making National Medicine Scientific" (*Guoyiyao kexuehua de miujian*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-486

³³ Ye Juquan, "Fallacies of Making National Medicine Scientific" (*Guoyiyao kexuehua de miujian*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-486

³⁴ He Peiyu, "A Letter to the Institute of National Medicine" (*Shang guoyiguan shu*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-441.

Pragmatists claimed) nor material observation and experimental verification (as Westernizers insisted), but logical systematicity—the capacity of a body of knowledge to cohere into a unified, transmissible, and internally non-contradictory structure. On the other side, Rationalists correspondingly reconceptualized Chinese medicine: not as a collection of effective clinical practices (Pragmatists' version), nor as a repository of empirical data awaiting biomedical validation (Westernizers' version), but as a theoretical system that already possessed scientific principles at its core—principles that had been progressively obscured by centuries of unsystematic theoretical accretion. These two operations were mutually constitutive: only by defining science as theoretical coherence could the disorder within Chinese medical theory be diagnosed as the primary obstacle to scientific recognition; and only by reconceptualizing Chinese medicine as an inherently systematic tradition buried under historical debris could the project of internal reorganization appear both necessary and sufficient for achieving scientific status.

Rationalists grounded their dual redefinition in a distinctive historiographical narrative. They argued that the primary obstacle Chinese medicine faced was not the absence of Western biomedical knowledge (as Westernizers claimed) but the internal disorder of its own theoretical traditions. Chinese medical theory had undergone successive waves of diversification since the Northern Song dynasty (960–1127), as Confucian bureaucrats, rival school founders, and competing doctrinal lineages generated an increasingly fragmented theoretical landscape (Goldschmidt 2009; Unschuld 2010; Bian 2020; Hanson 2013). Rationalists narrated this history as a story of decline from original coherence: pre-Song texts—above all the *Treatise*—were praised as models of systematic medical reasoning, while the metaphysical speculations that proliferated afterward were diagnosed as corruptions that had buried the tradition's inherent scientific logic. As He Peiyu put it, “The *Neijing*, while brilliantly detailing the connection between nature and man, is tainted by absurdities like the Five Phases, their generative and destructive cycles, and seasonal Qi calculations. It must be viewed as a combination of the refined and the rough.”³⁵ This historiographical framing was itself an act of reconceptualization: by narrating Chinese medical history as a fall from theoretical purity into metaphysical disorder, Rationalists constructed the image of a tradition that did not need to be replaced (as Westernizers proposed) or validated solely by clinical outcomes (as Pragmatists argued) but restored to its original systematic clarity.

The *Treatise* occupied a privileged position in all three groups' reconceptualizations of Chinese medicine, but each group appropriated it for fundamentally different reasons—revealing how the same canonical text could be made to serve divergent dual redefinitions. Pragmatists valued the *Treatise* for its direct clinical orientation, reading it as a compendium of effective therapeutic practice without any admixture of Yin-Yang or Five Phases. Westernizers valued it as a repository of pre-metaphysical empirical records that could be submitted to biomedical validation. Rationalists, by contrast, valued it precisely for its theoretical systematicity. As Liu Yuelun observed, the *Treatise* “categorizes diseases according to the six meridians in an orderly and methodical fashion... our nation's medicine inherently possessed scientific principles.”³⁶ For Rationalists, the *Treatise* demonstrated that Chinese

³⁵ He Peiyu, “A Letter to the Institute of National Medicine” (*Shang guoyiguan shu*), *Zhong xi yi yao* (Chinese-Western Medicine), vol. 2, no. 2, February 1936, CCMPO no. 5-10-441.

³⁶ Liu Yuelun, “On the Impossibility of National Medicine's Survival without Scientification” (*Guoyi fei kexuehua buneng tucun shuo*), *Guoyi gongbao* (National Medicine Bulletin), vol. 3, no. 3, January 1936, CCMPO no. 4-24-383.

medicine, at its best, was already a systematic science—not because it recorded effective treatments, but because it organized medical reasoning into a coherent, internally consistent framework. The divergent appropriations of the same text crystallize the logic of competing dual redefinitions: each group's definition of science determined what they saw when they looked at the classical canon.

This reconceptualization of Chinese medicine as an inherently systematic tradition placed Rationalists in direct opposition to both Pragmatists and Westernizers on the question of theoretical complexity. Pragmatists, by equating science with therapeutic efficacy, were content to reduce Chinese medicine to its clinical outputs—effective prescriptions and treatment records—while discarding the theoretical frameworks that guided their application. Ye Juanqing rejected this reductionism through a compelling legal analogy: medicine possesses “ironclad laws” (general principles) but no “ironclad cases” (identical patient conditions); practitioners, like judges, must deliberate each case through the application of theoretical reasoning to particular circumstances. To strip away theory in favor of standardized prescriptions would not be scientification but regression— “turning Chinese medicine into something simplified and slipshod.”³⁷ Crucially, Ye inverted the progressivist narrative that Westernizers had deployed to justify theoretical demolition. Where Westernizers argued that Chinese medicine's theoretical complexity was a symptom of historical degeneration—metaphysical accretions piled atop an empirical core—Ye argued the opposite: complexity was the mark of evolutionary achievement. “All things in the world move from the simple toward the complex... diagnosing root and branch, employing direct and inverse treatment—the more medicine evolved, the more sophisticated its methods became. This was not the ancients deliberately creating confusion to bewilder posterity, but the magnificent culmination of centuries of refined thought.” He described Chinese medicine as a system “highly scientific yet cannot be bound by [reductionist] science”—a formulation that simultaneously redefined science (as the capacity to handle complexity rather than to reduce it) and reconceptualized Chinese medicine (as a tradition whose sophistication was itself evidence of scientific maturity).

Unlike the Westernizers' approach of abolishing traditional theories—especially the core concept of Qi transformation (Qihua)—rationalists advocated for its preservation. However, opinions diverged on exactly how this preservation should be achieved. Some practitioners viewed the philosophy of Qi transformation as the very foundation of their practice. As Zeng Juesou and He Peiyu articulated: “Although the scope of Chinese medicine encompasses science, its root lies in the philosophy of Qi transformation.” They cautioned against entirely abandoning the profound concept of Qi transformation to focus solely on rigid morphology, which would effectively turn all practitioners into Western medicine doctors. They further argued: “Scientists acknowledge that what science cannot explain must be sought in philosophy. Even if science is omnipotent and the darling of the heavens, it cannot handle everything single-handedly. Given that Chinese medicine is fundamentally a philosophy of Qi transformation, how could it simply be assimilated into the physical and chemical sciences?” In contrast, other practitioners opposed framing Chinese medicine in philosophical terms. Instead, they sought to preserve the theory of Qi transformation by redefining it as an objective mechanism of the natural world. Liu Yuelun, for instance, equated “Qi transformation” with “invisible yet objectively existing natural forces.” In his essay, he posited that

³⁷ Ye Juanqing, “A Critique of Making Chinese Medicine Scientific” (*Zhongyi kexuehua pingyi*), *Beiping yiyao yuekan* (Beiping Medical Monthly), January 31, 1935, CCMPO no. 5-9-151.

although “Qi transformation, much like certain facts and abstract thoughts, provides no tangible material for direct observation or experimentation,” its existence could still be validated. Drawing a parallel to theoretical laws in the social sciences, he argued that one could prove its existence by “inferring causes from effects” (deducing the underlying cause through observed outcomes). At the same time, he restricted the concept of formless Qi to clinical etiology rather than the philosophical speculations.³⁸

The divergence between these two positions reveals that even within the Rationalist camp, the dual redefinition of science and Chinese medicine admitted of internal variation. Zeng and He expanded the boundaries of science to include philosophical reasoning, and correspondingly preserved Chinese medicine’s identity as a tradition rooted in Qi transformation philosophy—a move that echoed, in a different register, the Pragmatists’ expansion of science to include “spiritual science.” Liu, by contrast, kept the boundaries of science within the domain of objective causality, but reconceptualized Qi transformation itself—stripping it of its cosmological dimensions and redefining it as an empirically inferable natural mechanism, limited to clinical etiology rather than speculative metaphysics. Both approaches sought to preserve what Westernizers would have excised, but they did so through different configurations of the dual redefinition—one by expanding science, the other by contracting Qi. This internal fracture demonstrates that the strategic uncertainty inherent in boundary-crossing work operates not only between competing groups but also within them: even practitioners who agreed on the broad goal of theoretical preservation disagreed on the epistemological terms of that preservation.

The Rationalists’ insistence on theoretical coherence as the criterion of science led them to a distinctive position on the relationship between Chinese and Western medicine: neither assimilation nor isolation, but autonomous systematization. This stance was articulated most sharply through their critiques of the other two approaches. Qin Bowei identified “two bizarre phenomena” in the movement: “one is the forced application of Western medical theories and terminology to explain the medical classics, under the assumption that since Western medicine is ‘scientific,’ adopting its framework equates to scientization; the other is advocating that Chinese medicine practitioners study physics and chemistry, assuming that mastering these sciences is a prerequisite for becoming scientific.”³⁹ The first phenomenon targeted the Westernizers’ translational strategy; the second targeted the broader assumption—shared by Westernizers and some Pragmatists—that Western scientific training was a necessary condition for scientific legitimacy. Rationalists rejected both, not out of nativist resistance to Western knowledge, but because their dual redefinition rendered such translation unnecessary: if science meant internal theoretical coherence, then Chinese medicine could achieve scientific status through its own systematic reorganization, without passing through the “obligatory passage point” of Western biomedicine. As Zhang Ren’an stated bluntly: “national medicine is too complex; it cannot be Westernized... our scientization is simply scientization, not Westernization.”⁴⁰ Simultaneously, Rationalists maintained that the cosmological frameworks Westernizers sought to excise—Yin-Yang, Five Phases, pattern differentiation—constituted the epistemological core

³⁸ Liu Yuelun, “On the Impossibility of National Medicine’s Survival without Scientification” (*Guoyi fei kexuehua buneng tucun shuo*), *Guoyi gongbao* (National Medicine Bulletin), vol. 3, no. 3, January 1936, CCMPO no. 4-24-383.

³⁹ Qin Bowei, “National Medicine and Science” (*Guoyi yu kexue*), *Zhongyi shijie* (World of Chinese Medicine), vol. 5, no. 2, January 1933, CCMPO no. 3-30-373.

⁴⁰ Zhang Ren’an, “Making National Medicine Scientific” (*Guoyi kexuehua*), *Yijie chungqiu* (Annals of the Medical World), December 15, 1933, CCMPO no. 3-10-423.

that made Chinese medicine a distinctive theoretical system. As Ye Juanqing argued, “the theories of the generation and restriction of the Five Phases and the principles of Yin-Yang transmission” were “precisely where the essence of Chinese medicine resides, and the fundamental divergence in therapeutic paradigms between our tradition and Western medicine.”⁴¹ To discard these frameworks was not to purify Chinese medicine but to destroy its epistemic identity—the very outcome the Westernizers' dual redefinition produced. The Rationalists' reconceptualization of Chinese medicine thus preserved what Westernizers eliminated and systematized what Pragmatists left disorganized: a theoretical tradition that required internal purification, not external replacement.

The Rationalists' definition of science as theoretical coherence and transmissibility generated an institutional strategy that diverged sharply from both Pragmatists and Westernizers. For Pragmatists, whose dual redefinition equated science with therapeutic efficacy and Chinese medicine with cumulative clinical experience, institutionalization was primarily archival: compiling effective prescriptions and organizing folk remedies. Westernizers, by contrast, explicitly opposed institutionalization before epistemological transformation was complete; as Ye Juquan dismissed, a decade of building schools and founding associations had produced “nothing to show for it,” because institutional legitimacy without biomedical validation was an empty shell.

Rationalists charted a third path in which institutionalization was not a premature claim to legitimacy (as Westernizers charged) nor merely a matter of archiving existing practice (as Pragmatists pursued), but the key pathway through which Chinese medicine could achieve scientific status. If science meant theoretical coherence and systematic transmissibility, then the establishment of modern medical schools, standardized textbooks, and uniform licensing was itself an act of “making Chinese medicine scientific”. Qin Bowei articulated this logic with particular clarity: “A fundamental prerequisite of any discipline is its transmissibility... If I expend immense effort to acquire new knowledge and impart it to others, they can absorb it with less effort, allowing them to dedicate their own energies to generating further new knowledge.”⁴² The obstacle to transmissibility was not the absence of Western biomedical knowledge but the persistence of esoteric lineage transmission. As Chen Guofu diagnosed, Chinese medicine “relies solely on private transmission, lacking proper schools to cultivate general talent and forge a shared intellectual conviction.” The remedy was pedagogical modernization: “widely establishing Chinese medicine schools” that would teach indigenous medical subjects while “incorporating foreign strengths and rigorously engaging with science.”⁴³ This three-way divergence on institutionalization demonstrates that competing dual redefinitions did not remain at the level of abstract epistemology but generated fundamentally different visions of how scientific legitimacy should be practically pursued. Each group's institutional strategy was a direct extension of its paired redefinition of science and Chinese medicine: Pragmatists built archives because science was efficacy, and Chinese medicine was clinical experience; Westernizers demanded deferral because science was positivist verification and Chinese medicine needed radical reconstitution; Rationalists built schools because science was theoretical coherence and Chinese medicine needed systematic standardization.

⁴¹ Ye Juanqing, “A Critique of Making Chinese Medicine Scientific” (*Zhongyi kexuehua pingyi*), *Beiping yiyao yuekan* (Beiping Medical Monthly), January 31, 1935, CCMPO no. 5-9-151.

⁴² Qin Bowei, “National Medicine and Science” (*Guoyi yu kexue*), *Zhongyi shijie* (World of Chinese Medicine), vol. 5, no. 2, January 1933, CCMPO no. 3-30-373.

⁴³ Chen Guofu, “The Immaturity of Medicine and the Necessity of Making Chinese Medicine Scientific” (*Yixue youzhi ji zhongyi kexuehua bijiao*), *Guoyi gongbao* (National Medicine Bulletin), no. 10, 1934, CCMPO no. 4-21-14.

In sum, the Rationalists' boundary-crossing work thus operated through a dual redefinition in which science was reconceptualized as internal theoretical coherence and Chinese medicine was reconceptualized as an inherently systematic tradition requiring purification rather than replacement. Of the three approaches, this dual redefinition preserved the most of Chinese medicine's epistemic identity: unlike Pragmatists, who subordinated theory to efficacy, Rationalists placed theory at the center of their project; unlike Westernizers, whose passage through the biomedical gate dissolved Chinese medicine's theoretical distinctiveness, Rationalists insisted that the tradition's cosmological frameworks—Yin-Yang, Five Phases, Qi transformation—constituted its irreducible scientific core. Yet the Rationalists' position carried its own internal tension. Their call for theoretical purification required a criterion for distinguishing the “refined” from the “crude” within the tradition. But who held the authority to make this distinction, and on what basis? The disagreement between those who preserved Qi transformation as philosophical foundation (Zeng Juesou, He Peiyu) and those who recast it as objective natural mechanism (Liu Yuelun) suggests that the criterion of “internal coherence” was itself open to competing interpretations, generating further differentiation within the Rationalist camp. The Rationalists' dual redefinition thus resolved one problem—how to claim scientific status without submitting to Western biomedicine—while creating another: how to achieve theoretical standardization within a tradition defined by its interpretive plurality.

Conclusion

In K. Chimin Wong and Wu Lien-Teh's classical book *History of Chinese Medicine*, when they finished the long narrative of Chinese medicine and switched to the history of the acceptance of Western medicine, they cited famous words from *Faust*, “Wisdom becomes nonsense; kindness, oppression: To be a grandson is a curse”, to moan that Chinese medicine practitioners had been trapped in the clutches traditions and have been reluctant to embrace modern medicine. Whether intentionally or unintentionally, what they ignored was that those suffering practitioners did huge and complicated epistemic innovations to response Western medicine's efforts that demarcated Chinese medicine from science. The reality was: Practitioners of Chinese medicine were excluded from discussions of “scientific” definitions by professionals in biomedicine—their inherent epistemological rights were precisely what were suppressed by boundary-work. This article brings this narrative to light by deeply exploring those marginalized practitioners' various epistemic practices and conceptualizes it as the concept boundary-crossing work. On the one hand, they rejected the epistemic monopoly given by Western medicine practitioners and actively renegotiated the relationship between Chinese medicine and science by redefining the latter as therapeutic efficacy, material phenomena in positivist account, and reasoning. By doing that, they questioned the legitimacy of dominant position that Western medicine had been viewed as the only avatar of science and built pathways to the field of science. On the other hand, they also redefined the Chinese medicine in different ways. Pragmatist shaped Chinese medicine as an extensive archival of prescriptions medical records, which trains practitioners' abilities of clinical judgement and diagnosis; Westernizers viewed it as the repertoire of medical experiences and herbs repository, waiting for close examination; Rationalist interpreted that medical knowledge as an obscured theoretical system that should be purified. Those epistemic practices of dual redefinition paved ways for three directions: 1) challenge the biomedical hegemony and enact medical pluralization that Chinese medicine and Western medicine coexists; 2) redefine the boundary of science and thus support scientific multiculturalism; 3) diversify understandings of Chinese medicine and refute the myth that Chinese medicine is a solid and systematic knowledge entity.

Facing the complicated historical dynamics of “Making Chinese Medicine Scientific” movement, the concept boundary-work and the discussion related to demarcation fails to capture the marginalized group’s right and ability to provide dissenting opinions and ignores the possibility of medical pluralization and scientific multiculturalism. This mismatch requires us to further contextualize the scope of application of boundary-work. Boundary-work can help us to better understand the dominant group, including how they maintain their boundary and how the epistemic hierarchy generated, such as the naming process of complementary and alternative medicine (Gale 2014). For instance, Over the past two decades, physical therapists—situated firmly within the biomedical mainstream—have increasingly adopted needling techniques that substantially overlap with acupuncture of Chinese medicine. Rather than directly adopting the theory of acupuncture, they adapted it and renamed it “dry needling” to maintain biomedicine’s boundary (Zhou et al. 2015; Fan et al. 2017). In contrast, boundary-crossing work is particularly applicable when focusing on the perspectives of marginalized groups, especially how they strategically survived in front of a series of exclusion. Importantly, it invites us to closely observe how the marginalized make the knowledge break through the exclusive boundary and negotiated the relationship with science; meanwhile, how their various attempts redefine the criteria of science and their own knowledge. Besides, boundary-crossing work, by focusing on the marginalized, further questions the hypothesis that the exclusive demarcation between science and non-science is the only outcome of epistemic contests. In fact, attempts from marginalized groups probably reject demarcation but contribute to the pluralization within the field of science when dominant group’s boundary is not stabilized, as this article shows. Finally, boundary-crossing work does not serve as a substitute for boundary-work but rather adds a perspective to understand the destruction, repair, and regeneration of boundaries. Both concepts also reveals that the process of becoming behind certain boundaries could not be done in one time but runs as a looping effect (Hacking 1999).

Broadly speaking, the STS scholarship for understanding the dynamics between different knowledge is rich, such as boundary objects (Star and Griesemer 1989), trading zones (Galison 1997), and interactional expertise (Collins 2004). Those concepts have all illuminated how actors from different epistemic cultures manage to cooperate, communicate, and co-produce knowledge. Yet these concepts share a common assumption, as boundary-work has: the parties involved are, to varying degrees, able to participate in the encounter. However, when one party is completely excluded from the epistemological dialogue, these concepts fail to adequately describe the practices of the excluded party. Boundary-crossing work precisely fills this gap by putting the excluded one into the center of analysis and inquires how those marginalized groups make epistemic breakthroughs. This added perspective makes it visible that the dominant group fabricates a “objective” perspective and constantly ignore what other groups done, as K. Chimin Wong and Wu Lien-Teh’s citation implies.

The dynamics that boundary-crossing work captures are not unique to the Chinese case but the societies of medical pluralism. The concept of medical pluralism has been central to medical sociology and medical anthropology for decades, generating rich accounts of how patients navigate between different therapeutic options (Kleinman 1980; Cant and Sharma 1999), how healthcare professionals negotiate the boundaries of legitimate practice (Gale 2014), and how states regulate the coexistence of different medical traditions (Shim 2018).

What these accounts share, however, is a tendency to take the pluralistic structure itself as a given backdrop—a stage upon which actors make choices, negotiate positions, and pursue strategies. Less attention has been paid to how that stage was built in the first place. Boundary-crossing work invites us to ask a different kind of question: not how actors operate within medical pluralism, but how medical pluralism is historically produced through specific epistemic practices. The “Making Chinese Medicine Scientific” movement was, in this sense, not merely a chapter in the history of Chinese medicine; it was a constitutive episode in the making of China's pluralistic medical landscape. The dual redefinition documented in this article—of science and of Chinese medicine simultaneously—created the epistemic conditions under which two knowledge systems could come to coexist, interpenetrate, and compete within a shared institutional space. Beyond the Chinese context, this suggests a broader reorientation: Rather than treating medical pluralism as a structural condition to be typologized, or as a context within which individual choices are made, boundary-crossing work directs our attention to the ongoing epistemic labor through which pluralistic arrangements are constructed, contested, and sustained.

Reference

- Andrews B (2014) *The Making of Modern Chinese Medicine, 1850–1960*. Vancouver: UBC Press.
- Benedict C (1993) Policing the sick: Plague and the origins of state medicine in late imperial China. *Late Imperial China* 14(2): 60–77.
- Bian H (2020) *Know Your Remedies: Pharmacy and Culture in Early Modern China*. Princeton, NJ: Princeton University Press.
- Blumer H (1954) What is wrong with social theory? *American Sociological Review* 19(1): 3–10.
- Bourdieu P (1975) The specificity of the scientific field and the social conditions of the progress of reason. *Social Science Information* 14(6): 19–47.
- Bowker GC and Star SL (1999) *Sorting Things Out: Classification and Its Consequences*. Cambridge, MA: MIT Press.
- Callon M (1984) Some elements of a sociology of translation: Domestication of the scallops and the fishermen of St Brieuc Bay. *The Sociological Review* 32(1_suppl): 196–233.
- Cant S and Sharma U (1999) *A New Medical Pluralism: Complementary Medicine, Doctors, Patients and the State*. London: UCL Press.
- Cetina KK (2007) Culture in global knowledge societies: Knowledge cultures and epistemic cultures. *Interdisciplinary Science Reviews* 32(4): 361–375.
- Chiang H (2015) *Historical Epistemology and the Making of Modern Chinese Medicine*. Manchester: Manchester University Press.
- Choa GH (1993) The Lowson diary: A record of the early phase of the Hong Kong bubonic plague 1894. *Journal of the Hong Kong Branch of the Royal Asiatic Society* 33: 129–145.
- Clark DL (2020) Tradition reinvented: The reimagination of Kanpō medicine in twentieth century Japan. Dissertation, University of Kansas.
- Collins H (2004) Interactional expertise as a third kind of knowledge. *Phenomenology and the Cognitive Sciences* 3(2): 125–143.
- Croizier RC (1968) *Traditional Medicine in Modern China: Science, Nationalism, and the Tensions of Cultural Change*. Cambridge, MA: Harvard University Press.
- Daston L (2009) Science studies and the history of science. *Critical Inquiry* 35(4): 798–813.
- Daston L and Galison P (2007) *Objectivity*. New York: Zone Books.
- Dear P and Jasanoff S (2010) Dismantling boundaries in science and technology studies. *Isis* 101(4): 759–774.
- Decoteau CL (2021) *The Western Disease: Contesting Autism in the Somali Diaspora*. Chicago, IL: University of Chicago Press.
- Dongwon S (2008) How four different political systems have shaped the modernization of traditional Korean medicine between 1900 and 1960. *Historia Scientiarum* 17(3): 225–241.
- Du L (2024) *The Northeastern Great Plague: Western Methods of Epidemic Control in China*. Beijing: Social Sciences Academic Press.

- Epstein S (1995) The construction of lay expertise: AIDS activism and the forging of credibility in the reform of clinical trials. *Science, Technology, & Human Values* 20(4): 408–437.
- Evans R (2005) Introduction: Demarcation socialized: Constructing boundaries and recognizing difference. *Science, Technology, & Human Values* 30(1): 3–16.
- Fan AY, Xu J and Li YM (2017) Evidence and expert opinions: Dry needling versus acupuncture (II): The American Alliance for Professional Acupuncture Safety (AAPAS) white paper 2016. *Chinese Journal of Integrative Medicine* 23(2): 83–90.
- Feest U and Sturm T (2011) What (good) is historical epistemology? Editors' introduction. *Erkenntnis* 75(3): 285–302.
- Furth C (1999) *A Flourishing Yin: Gender in China's Medical History, 960–1665*. Berkeley, CA: University of California Press.
- Gale N (2014) The sociology of traditional, complementary and alternative medicine. *Sociology Compass* 8(6): 805–822.
- Galison P (1997) *Image and Logic: A Material Culture of Microphysics*. Chicago, IL: University of Chicago Press.
- Gieryn TF (1983) Boundary-work and the demarcation of science from non-science: Strains and interests in professional ideologies of scientists. *American Sociological Review* 48(6): 781–795.
- Gieryn TF (1999) *Cultural Boundaries of Science: Credibility on the Line*. Chicago, IL: University of Chicago Press.
- Goethe JW von and Kaufmann W (1990) *Goethe's Faust: Part One and Sections from Part Two*. New York: Anchor Books.
- Goldschmidt AM (2009) *The Evolution of Chinese Medicine: Song Dynasty, 960–1200*. London: Routledge.
- Hacking I (1999) *The Social Construction of What?* Cambridge, MA: Harvard University Press.
- Hanson ME (2013) *Speaking of Epidemics in Chinese Medicine: Disease and the Geographic Imagination in Late Imperial China*. First paperback edition. London: Routledge.
- Haraway D (2013) Situated knowledges: The science question in feminism and the privilege of partial perspective. In: *Women, Science, and Technology*, 3rd ed. New York: Routledge.
- Harding SG (1991) *Whose Science? Whose Knowledge? Thinking from Women's Lives*. Ithaca, NY: Cornell University Press.
- Haydu J (1998) Making use of the past: Time periods as cases to compare and as sequences of problem solving. *American Journal of Sociology* 104(2): 339–371.
- Haydu J (2010) Reversals of fortune: Path dependency, problem solving, and temporal cases. *Theory and Society* 39(1): 25–48.
- Hsu E (ed.) (2001) *Innovation in Chinese Medicine*. Cambridge: Cambridge University Press.
- Karchmer EI (2013) Ancient formulas to strengthen the nation. *Asian Medicine* 8(1): 108–139.
- Kleinman A (1980) *Patients and Healers in the Context of Culture: An Exploration of the Borderland Between Anthropology, Medicine, and Psychiatry*. Berkeley, CA: University of California Press.
- Kuriyama S (1999) *The Expressiveness of the Body and the Divergence of Greek and Chinese Medicine*. New York: Zone.
- Lei SH (2002) How did Chinese medicine become experiential? The political epistemology of jingyan. *Positions: Asia Critique* 10(2): 333–364.
- Lei SH (2012) Qi-transformation and the steam engine: The incorporation of Western anatomy and reconceptualisation of the body in nineteenth-century Chinese medicine. *Asian Medicine* 7(2): 319–357.
- Lei SH (2014) *Neither Donkey nor Horse: Medicine in the Struggle Over China's Modernity*. Chicago, IL: University of Chicago Press.
- Lewis MJ and Macpherson KL (2008) *Public Health in Asia and the Pacific: Historical and Comparative Perspectives*. London: Routledge.
- Luesink D (2019) Introduction: China and the globalization of biomedicine. In: Luesink D, Schneider WH and Zhang D (eds) *China and the Globalization of Biomedicine*. Rochester, NY: University of Rochester Press.
- Ma S, Li N and Mao W (2026) Transmitting the body: Benjamin Hobson, Quanti Xinlun, and the dawn of Western anatomy in China. *Religions* 17(1): 4.
- Monnais-Rousselot L, Thompson CM and Wahlberg A (eds) (2012) *Southern Medicine for Southern People: Vietnamese Medicine in the Making*. Newcastle upon Tyne: Cambridge Scholars Publishing.
- Navon D (2024) Reiterated fact-making: Explaining transformation and continuity in scientific facts. *American Sociological Review* 89(5): 849–875.
- Pickstone JV (1993) Ways of knowing: Towards a historical sociology of science, technology and medicine. *The British Journal for the History of Science* 26(4): 433–458.

- Rheinberger HJ (2010) *An Epistemology of the Concrete: Twentieth-Century Histories of Life*. Durham, NC: Duke University Press.
- Scheid V (2002) *Chinese Medicine in Contemporary China: Plurality and Synthesis*. Durham, NC: Duke University Press.
- Scheid V (2007) *Currents of Tradition in Chinese Medicine, 1626–2006*. Seattle, WA: Eastland Press.
- Scheid V and Lei SH (2014) The institutionalization of Chinese medicine. In: *Medical Transitions in Twentieth-Century China*. Bloomington, IN: Indiana University Press.
- Shaohong C (2017) *Rizhi shiqi Taiwan huanghan yidao fuhuo yundong* [The Revival Movement of Kōkan Medical Practice in Colonial Taiwan under Japanese Rule]. Taipei: Zhengda chubanshe, Guoshiguan.
- Shim JM (2018) Three plural medical systems in East Asia: Interpenetrative pluralism in China, exclusionary pluralism in Korea and subjugatory pluralism in Japan. *Health Policy and Planning* 33(3): 401–410.
- Star SL and Griesemer JR (1989) Institutional ecology, 'translations' and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39. *Social Studies of Science* 19(3): 387–420.
- Suh S (2017) *Naming the Local: Medicine, Language, and Identity in Korea since the Fifteenth Century*. Cambridge, MA: Harvard University Asia Center.
- Summers WC (2012) *The Great Manchurian Plague of 1910–1911: The Geopolitics of an Epidemic Disease*. New Haven, CT: Yale University Press.
- Tang YHP, Frost L, Morgan R, et al. (2025) Public health in a transnational context: Hong Kong and the third bubonic plague pandemic. *Journal of Urban History* 51(3): 585–601.
- Taylor K (2011) *Chinese Medicine in Early Communist China, 1945–1963: A Medicine of Revolution*. London: Routledge.
- Unschuld PU (2010) *Medicine in China: A History of Ideas*. Berkeley, CA: University of California Press.
- Whooley O (2010) Organization formation as epistemic practice: The early epistemological function of the American Medical Association. *Qualitative Sociology* 33(4): 491–511.
- Whooley O (2013) *Knowledge in the Time of Cholera: The Struggle over American Medicine in the Nineteenth Century*. Chicago, IL: University of Chicago Press.
- Wu YL (2010) *Reproducing Women: Medicine, Metaphor, and Childbirth in Late Imperial China*. Berkeley, CA: University of California Press.
- Wu YL (1995) *Memories of Dr. Wu Lien-Teh, Plague Fighter*. Singapore: World Scientific.
- Yin H, Zhu Y, Fu L, et al. (2024) The characteristics and influence of formula presenting in the 1950s. *Chinese Journal of Medical History* 54(4): 254–257.
- Zhan M (2009) *Other-Worldly: Making Chinese Medicine through Transnational Frames*. Durham, NC: Duke University Press.
- Zhang R and Zhang W (2009) The campaign dedicated to collecting prescriptions in the 1950s. *Chinese Journal of Medical History* 39(5): 303–307.
- Zhang Y (2007) *Transforming Emotions with Chinese Medicine: An Ethnographic Account from Contemporary China*. Albany, NY: State University of New York Press.
- Zhou K, Ma Y and Brogan MS (2015) Dry needling versus acupuncture: The ongoing debate. *Acupuncture in Medicine* 33(6): 485–490.