

Practicing Mr. Science: Chinese Scientists and the May Fourth Movement from Zhu Kezhen to Fang Lizhi

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Abstract As many historians who have studied the May Fourth have recognized, science was an important part of both the May Fourth, with Mr. Democracy and Mr. Science as its two banners, and its impact. Yet, besides valuable studies by Fan Hongye (樊洪业) and others on the close connections between the May Fourth and the Science Society of China and Charlotte Furth on the geologist Ding Wenjiang, little has been done on the relationship between Chinese scientists and the May Fourth, especially in the late twentieth century. In an attempt to explore this critical dimension of the May Fourth history, I have chosen to examine the lives and careers of two prominent practicing scientists and their connections with the May Fourth: the meteorologist Zhu Kezhen (竺可桢 1890–1974) and the astrophysicist Fang Lizhi (方励之 1936–2012). Both identified primarily as scientists even as they carried out administrative duties and political activism (in Fang’s case), their evolving and differentiated views of the May Fourth and its legacy indicated possibly generational and disciplinary dynamics at work.

Keywords China ▪ May Fourth ▪ Mr. Science ▪ Zhu Kezhen 竺可桢 ▪ Fang lizhi 方励之

There are many challenges facing historians in studying the May Fourth in modern Chinese history, and a central one is its malleability. Does it stand for an event that took place on 4 May 1919, or a broader movement, or, similarly, a period that encompassed early Republican China (1911–1927)? If we take it to mean the latter two, as the

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popular phrases “the May Fourth Movement” or “May Fourth Era” imply, then one needs to be careful in distinguishing between what happened *during* the movement/period and what happened *due to* it. Adding to this complexity is the necessity to consider its legacy, or legacies, which differed not only across individuals and groups but also in subsequent time periods and in transnational contexts. While the Chinese Communist Party has fairly consistently defined it as an event of revolutionary patriotism (“anti-imperial, anti-feudal”), others have seen it as a literary revolution (“the New Culture”), or the heralding of liberal values such as science and democracy. There is the additional question of the May Fourth both as an actual historical phenomenon (as any of the above three) and as a symbol, a myth, a slogan, an abstract concept with nevertheless powerful impact. Indeed, its meaning has been under constant contestation partly because its living legacy has been part of its nature. Thus, even as its centennial was celebrated in 2019 and afterwards, we still feel like the blind people touching the proverbial elephant, except that we are not sure that such a solid, unitary animal actually exists except for the many shadows it has cast.

Fortunately, we can resort to pluralism and there are many lenses through which one can examine both the history and the significance of the May Fourth. As the papers in this special issue indicate, there are diverse approaches even as we focus on the specific subject of the relationship between the May Fourth and science and technology. As many historians who have studied the May Fourth have recognized, science was an important part of both the May Fourth and its impact. After all, Mr. Democracy (德先生) and Mr. Science (赛先生) were the two banners usually associated with the movement. As Fan Hongye 樊洪业, a leading Chinese historian of modern Chinese science, has argued, the New Culture Movement benefited from its close association with the Science Society of China, which was formed by Chinese students studying science and engineering in the US in 1914–1915 and whose magazine *Kexue* (科学 Science) had called for science and democracy in China prior to (and possibly influencing) Chen Duxiu’s (陈独秀 1879–1942) more influential *Xin Qingnian* (新青年 New Youth) (Fan 1989; Wang 2002).¹

Yet, in much of the literature on the subject, especially outside of China, studies on the May Fourth have not examined science and scientists in much detail; those few that did, with a few notable exceptions, such as Charlotte Furth’s biography of the geologist Ding Wenjiang (丁文江, 1887–1936), focused often on scientism and advocates for science who were often not practicing scientists themselves (Chow 1960; Furth 1970). What did the May Fourth and its legacies look like when we do focus on the roles and experiences of practicing, professional scientists? For example, did their views of the May Fourth (and its impact on them) have anything to do their own scientific fields? How did generational dynamics and transnational exchanges shape their relationship with the May Fourth and their own political activism?

In an attempt to answer these questions, I have chosen to examine the lives and careers of two prominent practicing scientists in China in the twentieth century: the meteorologist Zhu Kezhen (竺可桢, 1890–1974) and the astrophysicist Fang Lizhi

¹Unless otherwise noted, all Chinese names in the text are rendered in pinyin in the order of family name first and given name second, followed by their Chinese characters in parentheses.

(方励之, 1936–2012). As is usually the case, it's difficult to argue definitively that they, or any two scientists, could be regarded as the embodiment of Mr. Science or as representatives of their respective generations. Yet, there are justifications and merits in considering this particular pair: both were practicing scientists in the sense that both saw their identities primarily as scientists even as they carried out administrative duties such as university presidencies (and political activism on Fang's part), both continued to engage in scientific research in their chosen fields throughout their adult lives. And finally, both are among the better documented scientists we have in modern Chinese history.

1 Zhu Kezhen and the May Fourth

The most striking finding when one examines Zhu Kezhen's views and relationship with the May Fourth was the contrast in them before and after the Communist victory and the founding of the People's Republic of China in 1949. Born in 1890 in the Shaoxing area in Zhejiang, a region with a rich literary and cultural tradition, Zhu was among the first generation of Chinese students and scientists to have received both traditional Chinese and western education. In 1910, he won one of the coveted Boxer fellowships, along with other well-known future May Fourth figures such as Hu Shih (胡适 Hu Shi, 1891-1962) and Yuen Ren Chao (赵元任 Zhao Yuanren, 1892–1982), and came to study in the US. He majored in agriculture at the University of Illinois at Urbana because of the subject's importance for China but quickly became dissatisfied when he found it to be not intellectually stimulating and the way it was practiced in the US, including the slavery-like plantation system in the American south, not transplantable to China.² Zhu switched in 1913 to meteorology at Harvard for graduate study as a compromise between his growing interest in basic science and his strong nationalist commitment. At Harvard he also became involved in the new Science Society of China where he found kindred spirits who shared his passions for science as a new profession, a way to reform Chinese culture, and a tool of nation-building. Other leaders included the above mentioned Hu Shih and Yuen Ren Chao as well as Ren Hongjun (任鸿隽, 1886–1961), Yang Xingfo (杨杏佛, 1893-1933), Hu Mingfu (胡明复, 1891–1927), Bing Zhi (秉志, 1886–1965), and Zhou Ren (周仁, 1892-1973). All of them, except for Hu Shih, who switched from agriculture to philosophy, and Yuen Ren Chao, who turned from mathematics and physics to linguistics, studied science or engineering in the US and then returned to China in the late 1910s to become founders of their respective fields in China.

Zhu himself returned to China in 1918 to teach meteorology and geography at several universities, and indeed was a founding figure of departments in these fields there. He continued to be active in the Science Society where he came to know not only those who had returned from the US, but also those who had returned from Europe such as the geologists Ding Wenjiang and Weng Wenhao (翁文灏, 1889–1971). Yet in contrast to Ding and Ren and especially Hu Shih, who became

²The better known, non-pinyin spellings for Hu Shih and Yuen Ren Chao, who spent most of their careers outside of mainland China, are used in this paper.

active participants in the broader May Fourth Movement, especially the 1923 great debate over science and the philosophy of life, Zhu Kezhen largely stayed away from the limelight of these cultural conflicts. He did write many articles in the Science Society's *Kexue* to advocate for science, education, and rational policy making based on science, including the building of a national network of weather stations, but he did not engage in the polemics over scientism or the national politics that drew some of his activist colleagues.

Was Zhu Kezhen exceptional or representative of his generation of practicing scientists in term of his distance from the May Fourth radicalism? If we examine the background of those scientists who were active in the May Fourth, especially the 1923 debate, we found that most of them were more scientific advocates than practicing scientists. Ren Hongjun, for example, had studied chemistry at Cornell and Columbia and was really the moving spirit behind the Science Society for the rest of his life, but he never carried out actual scientific research of his own. The closest to a practicing scientist among the activists was Ding, who not only was a founding figure of modern geology in China but also tried to engage in field geological research whenever he could. But even for him, there were so many other administrative and political duties that he took on, such as the governor general of Shanghai at one point, that it was difficult to see him purely or mainly speaking as a scientist in the May Fourth debates.

Why, then, did Zhu, and possibly other practicing Chinese scientists, keep their distance from the May Fourth movement? For years scholars sensed this interesting disconnect but had no definitive explanations. The recent publication of Zhu Kezhen's collected papers (竺可桢全集) has given us some valuable clues. It included, for example, Zhu's 1961 "intellectual autobiography" (思想自传) which accompanied his application for membership in the Chinese Communist Party. In it he recounted his reactions to the May Fourth Movement proper in 1919 as an instructor at the Wuchang Advanced Normal School:

When the "May Fourth Movement" took place in Beijing following the Paris [Versailles] Treaty, there were enthusiastic reactions in Wuchang. This was a major event in both the history of revolutions and in student movements. But I did not realize its importance then, instead thinking of it as being analogous to events in Chinese history such as the demand by imperial court students, led by Chen Dong (陈东), for the retention of Li Gang (李纲) and the execution of Cai Jing (蔡京) [in the Song dynasty]. I did not know that it was the beginning of the movement by all the Chinese people against imperialism and feudalism. (Zhu [1961] 2004, 90)

Here Zhu evidently was referring to the May Fourth as an event, the demonstrations of students in Beijing on 4 May 1919, against the Versailles treaty that had given the former German territories in China to Japan in complete disregard of Chinese sovereignty. He then went on to confess that not only did he not recognize the revolutionary nature of the May Fourth as an event, but also he was passively resistant to the May Fourth as a broader cultural movement:

In 1920 I moved to the Nanjing Advanced Normal School, which was soon reorganized as the Southeastern University . . . This was shortly after the "May Fourth Movement," when Hu Shih and Chen Duxiu in northern China advocated vernacular Chinese. At the

Southeastern, however, Liu Boming (刘伯明), Liu Yimou (柳翼谋), and Mei Guangdi (梅光迪) advocated classic restoration, launching their own magazine *Xueheng* (学衡 Critical Review) as a rival to *Xin Qingnian*. This was indeed a movement against the tide of the time. Even though I did not join the little circle around *Xueheng*, neither did I enthusiastically advocate the vernacular, which was due more or less to the influence of *Xueheng*. (Zhu [1961] 2004: 90-91)³

Here Zhu Kezhen neglected to mention Hu Xiansu (胡先骕, 1894-1968), another practicing scientist and founder of modern botany in China, who was a most active participant in *Xueheng* (Shen 1999: 147-221).

In the same document Zhu would use the May Fourth in its third rendition, as a time period. In it he listed a set of beliefs that formed his “philosophy of life” before 1949, which included “saving China through science” (科学救国), “politics of the wise[men]” (贤人政治), “individual liberalism” (个人自由主义), and “the idea that humans are born to be kind” (人性本善的观念). He then elaborated on the first in connection with the May Fourth:

“Saving China through Science” was a slogan that was identified by many of the young scientific workers during the May Fourth period 五四时期. But from the time when Yuan Shikai (袁世凯, 1859-1916) proclaimed himself the emperor to the years when Jiang Jieshi (蒋介石 Chiang Kai-shek, 1887-1975) was in power, not only did science advance very slowly, and even those few resources developed by using science were taken over by foreign merchants or by the four families such as the Kongs and Songs, providing no benefit whatever to the country. (Zhu [1961] 2004: 101)

So, from the vantage point of 1961, when a succession of political campaigns under the Chinese Communist leader Mao Zedong (毛泽东, 1893-1976) had driven home the revolutionary significance of the May Fourth, Zhu Kezhen engaged in politically correct self-criticism on his distance from the May Fourth movement as both a nationalist event and as a cultural movement that included the vernacular campaign. Yet, what the materials included in his collected works indicated was a more nuanced stand: while he never enthusiastically embraced May Fourth radicalism, he was not unaware of its legacy of science and democracy.

Zhu Kezhen left the Southeastern in 1925 amidst chaos over the appointment of its president and went to the Commercial Press for about a year where he helped edit popular science books. He taught at Nankai University in Tianjin and then returned briefly to Southeastern when the Nationalists came to power in 1927 and then in 1928 left it again to become director of the new Institute of Meteorology of the recently established Academia Sinica under the Nationalist government. Cai Yuanpei (蔡元培, 1868-1940), a central May Fourth figure, was the founding president of Academia Sinica (Cai had been president of Beijing University or Beida and also was an influential patron of the Science Society). Under Zhu’s leadership and with Cai’s support, the institute became not only the leading site for conducting research and

³Li Gang 李纲 and Cai Jing 蔡京 were widely regarded as respective leaders of the good and corrupt officials in Song China. “Critical Review” was the title chosen by the editors of *Xueheng* as its English title. Literally “Xueheng” means “learning balanced” (Chow 1960: 282).

training young scientists and technicians for the field, but also, until 1942, the *de facto* weather bureau for the nation (Xue and Zhang [1984] 2009: 4-5).

Then, in 1936, Zhu was picked by Jiang himself to serve as the president of Zhejiang University (Zheda) (while continuing to head the Institute of Meteorology for another decade). In the available record we find Zhu making his first public reference to the May Fourth on 25 April 1936 during his initial talk to Zheda students, albeit only in passing: “Today’s national crisis facing China is more serious and complex than even those during the May Fourth or the Northern Expedition periods” (Zhu [1936] 2004: 337). Then about ten days later, on May 4, Zhu delivered another talk at Zheda as part of the memorial lecture series in honor of Sun Zhongshan (孙中山 Sun Yat-sen, 1866-1925) (总理纪念周), the late founder of the Nationalist Party, as mandated by the Nationalist government. In it, Zhu, according to his diary, talked about how Chinese universities widely followed the common American model, with a total neglect of moral education. His remedy was to establish a system whereby professors also served as mentors to students guiding them in terms of not only studies but also personal conduct, as had been practiced at a few American universities such as his alma mater Harvard. Then noting that it was the 17th anniversary of the May Fourth movement, he remarked that “since the May Fourth, students have tended to be pessimistic, which was caused by a lack of faith in the certain rejuvenation of the Chinese nation” (Zhu 2005-2011: v. 6, 67). Here it is not clear whether he was using the May Fourth as a marker of time or as the cause of what he observed as growing student pessimism.

Zhu’s faith in science, if not the May Fourth itself, came through most strikingly in his heroic leadership of Zheda during the difficult years of the war of resistance against the Japanese invasion of 1937–1945. Setting “Seeking the Truth” (求是) as the motto for the university on 19 November 1938, Zhu led it on a perilous journey inland to escape from the advancing Japanese army while strengthening its research and teaching, especially in the sciences and engineering. By the end of the war, Zheda ranked among the best universities in China and drew attention from international scientists such as the biochemist Joseph Needham who was serving as representative of the British government in wartime China. Such achievements came at great personal costs to Zhu as he lost his wife Zhang Xiahun (张侠魂, 1897–1938) and one of his sons Zhu Heng (竺衡, 1924–1938) to disease during exile and as his duties at Zheda prevented him from conducting meteorological research. His achievements, sacrifices, and personal integrity earned him lasting admiration both within Zheda and in the wider Chinese scientific community (Wang 2018a).

Although Zhu never wavered about the importance of science and its value for China, he continued to express his ambivalence about the May Fourth after the war. On 3 February 1946 in Zunyi, Guizhou, where Zheda had moved during the war, Zhu Kezhen participated in a Christian fellowship activity where he gave a talk on “Democracy and Religion.” While he never became an observant Christian, Zhu had first attended church service as a student in Illinois and would occasionally join Christian activity at Zheda before 1949. Here in this talk he presented his reflections on both traditional Chinese culture and the New Culture movement, as he summarized it in his diary later that day:

Since the May Fourth, Mr. Science and Mr. Democracy have been popularized. Now, Mr. Science has been worshipped in China by everyone from long ago, and Mr. Democracy has also gained a following nationwide. Recently, at the Political Consultative Conference in Chongqing there was unanimous endorsement of democracy, seemingly promising an absolutely bright future for China. But could China reach a paradise of wealth and power through **Science** and **Democracy** alone? I believe that this will not be enough to fulfill our wishes, because a vital element, religion, is missing in our culture Chinese culture consisted of the philosophies of Confucius, Mencius, Laozi, and Zhuangzi, which are not bad in their own rights but do not suit the current circumstances. This is because these views of life were based on the agricultural society. The need now is to modernize, to industrialize, which could not be met by this kind of philosophy. Western culture, according to **B. Russell**, was the combination of Greek ethics and Christianity. **Irving Babbitt** also said that the western culture was the **Principle of religion** plus the **Principle of gentleman**. The latter could be substituted by humanism, but it will be inadequate without the former, because **Faith** will be missing. The advantage of religion was that it teaches humans **Humility** and **Faith**. Jesus said “**Love thy enemy**” and the *Analects of Confucius* stated that “all men are brothers,” both **Idealisms**. Today, as **Realism** dominates the world, we urgently need **Idealism**. (Zhu 2005-2011: v. 10, 34)⁴

Here Zhu Kezhen revealed, in a semi-public setting, religion as a source of his ambivalence about the May Fourth that he did not mention in his 1961 autobiography. The seemingly contradictory themes of Chinese classic restoration and appreciation of western style religion formed an important element of *Xueheng* with the American conservative scholar Irving Babbitt as a central influence (Shen 1999).

As the Chinese civil war between Nationalist government and the Communist forces intensified in the late 1940s, Zhu was increasingly caught up in the middle of the conflict. Seeing himself as a liberal intellectual, Zhu was disgusted with the corrupt and authoritarian Nationalists but was also wary about the Communists that he knew little about. Frustrated by both the student leaders who, with the support of underground Communist Party members, organized boycotts and other forms of anti-government protests, and government officials who ordered him to punish them, Zhu repeatedly threatened to resign the presidency of Zheda. He eventually decided to give the Communists the benefit of the doubt in 1949 when he declined a request from Jiang to retreat with him to Taiwan. Instead he hid in Shanghai and waited for the coming of the People’s Liberation Army. On May 27, the day after the PLA took over the city, he shared with the physicist Wu Youxun (吴有训, 1897–1977) his views of the Nationalists and hope for the Communists, as he recorded in that day’s diary:

In 1927 the Nationalists launched the Northern Expedition [to overthrow the warlords and unify the country], and the people rejoiced like they do today. But the Nationalists did not invigorate themselves; instead they covered up corruption and lacked clear rules in regard to rewards and punishments, leading to their collapse today. The people now welcome the Liberation Army as clouds amidst a drought. [I] hope that [the Communists] can work hard all the way to the end, and won’t be as corrupt as the Nationalists. Science is extremely important for construction, and [I] hope that the Communists will pay close attention to it. (Zhu 2005-2011: v. 11, 448)

⁴Phrases in bold were those Zhu had written in English in his diary, with the first letters capitalized.

Meanwhile, a few weeks earlier, on 4 May 1949, in Hangzhou, Xu Liangying (许良英, 1920–2013) a young physicist on the teaching staff at Zheda who had been a leader of the local Communist chapter and who had respected Zhu for his tolerance and sympathy of student activists, had organized a mass rally, on campus, of the city’s college and middle school students, both to welcome the PLA and to commemorate the thirtieth anniversary of the May Fourth Movement. In an “Appeal to Students of the City” (告全市同学书) distributed at the rally, Xu gave the new party line on the May Fourth as a revolutionary movement instead of the Mr. Science and Mr. Democracy that Zhu had associated it with in 1946:

On May Fourth, thirty years ago, under the inspiration of the victorious Russian October revolution, our predecessor students held high the banners of anti-imperialism and anti-feudalism and broke the path toward the new Chinese democratic revolution. (Xu 1993: 238)⁵

It is not clear from the surviving records whether Zhu ever saw Xu’s “Appeal”—he did note Xu in his diary on 10 June 1949 as being among a nine-member committee put in charge of Zheda in his absence—but the recharacterization of the May Fourth contained in it was among the first lessons he would learn after he moved to Beijing in late 1949 as one of the vice presidents of the newly established Chinese Academy of Sciences (CAS) (Zhu 2005–2011: v. 11, 457–458; Wang 2018b). In one of his earliest public presentations in the PRC era, an 30 April 1950 speech at a gathering at Qinghua (Tsinghua) University on the 39th anniversary of its founding, Zhu Kezhen spoke highly of the May Fourth as an event, in language that was similar to Xu’s a year earlier: “It has been thirty one years since May 4 1919 when several thousands of students in Beijing held demonstrations against the Duan Qirui (段祺瑞, 1865–1936) government, demanded the abolition of the 21 Points treaty of national betrayal, and erected banners of anti-imperialism and anti-feudalism” (Zhu [1950] 2004a: 20). Both Xu’s and Zhu’s statements were in keeping with the Communist official verdict on the May Fourth as set forth by Mao Zedong himself in his famous speech in Yanan on 9 January 1940. In it, Mao praised the May Fourth as the start of “the new revolutionary process” in China, heralding the founding of the Chinese Communist Party in 1921, but did not mention its calls for Mr. Science and Mr. Democracy (Mao [1940] 1965: 347, 371). In January 1952, when Zhu and the CAS came under attack for inadequate political correctness in its publications, he would request that Xu be moved to the CAS as an editor to remedy the situation (Zhu 2005–2011: v. 12, 538–541).

Even as Zhu learned to toe the new political line on the May Fourth, he persisted in advocating for science. In his 1950 address at Qinghua, Zhu went on to describe the “internal contradictions” of the universities in the Republican era, such as their preferences for cities over the countryside, intellectuals over laborers, and bourgeois over peasants and workers, before issuing his call for universities to train students to

⁵By the time he recounted this episode in his autobiography in 1993, Xu had emerged as a prominent political dissident disillusioned with the Chinese Communist Party and would comment on his “fundamental error” in his “appeal” in 1949: “[It] did not mention at all the core content of the May Fourth: democracy and science” (Xu 1993: 238–239).

be good “using both brain and hands” (手脑并用), thus integrating theory and practice. But he showed a consistency with his earlier advocacy of scientific research when he reminded the audience that “as we train a very large number of talents we should not forget that advanced research should not be abandoned by any good university” (Zhu [1950] 2004a: 20–21).

In another paper written in April 1950 Zhu credited “Beijing University’s advocacy for science during the May Fourth period” for the beginning of scientific research in Chinese universities. Blaming parochialism and scientists’ pursuit of “science for science’s sake” under the Nationalists for its poor showing, Zhu now pointed to Soviet planned science as a model for Chinese scientists to follow as they tried to serve the needs of the state and the people. Yet, once again, he tried to protect basic scientific research: “Some believe that in order to emphasize the practical applications of science we can completely abandon basic theoretical scientific research, and get every scientist to engage in work directly related to production. This is the wrong approach In view of the complex relationship between science and construction, basic scientific research should not be neglected” (Zhu [1950] 2004b: 24–25).

In view of the newly elevated political status of the May Fourth, it is conceivable that Zhu Kezhen consciously utilized it as a resource in his promotion of basic scientific research, especially when the latter came under repeated political attacks (Wang 2018b). For example, on 30 September 1955, in a speech welcoming a cultural delegation from Italy, Zhu made a point about how “the famous Chinese May Fourth movement” marked the beginning of modern science in China, “laying the foundation for the development of science in China today” (Zhu [1955] 2004a: 230). And then in the same year, in his preface for a volume of reprinted meteorological papers from the Republican period, Zhu again highlighted May Fourth as a milestone: “Since the ‘May Fourth’ we Chinese gradually recognized the importance of scientific research, and scientific research was promoted at various universities,” resulting in considerable progress as represented in the volume in question (Zhu [1955] 2004b: 251).

The intensified political attacks on bourgeois intellectuals, including many scientists from the May Fourth era with background of education in the US and Europe, in the 1957 “Anti-rightist” and then the Great Leap Forward campaigns may have resulted in Zhu’s erasure of Mr. Science and Mr. Democracy as part of the May Fourth legacy in his 1961 intellectual autobiography. Months before he penned it he had learned that his eldest son Zhu Jin (竺津, 1921–1961) had died in a labor camp after having been purged as a rightist in 1958 (Zhu 2005–2011: v. 15, 101–102; Zhu [1961] 2008). Instead, Zhu highlighted its anti-imperial and anti-feudal revolutionary political characters in keeping with Mao Zedong’s 1940 verdict. Contrasting the failure of the drive to “save China through science,” by him and other like-minded scientists, from the May Fourth to 1949, he celebrated the successes afterward:

Since the liberation, the advances in culture and science have far exceeded my old dreams, and science has been widely applied in industry, agriculture, transportation, and water conservancy, bringing happiness to the people and creating wealth for the nation. Thus, I realized that “saving China through science” can only succeed under the leadership of the Chinese Communist Party. (Zhu [1961] 2004: 101)

Then during the brief liberal interlude in the early 1960s, Zhu again associated the May Fourth with science (and even democracy). In an essay that appeared in the CCP's official journal *Red Flag* (红旗) in 1962 titled "Viewing the Rapid Development of Science in the Motherland with Delight," Zhu recounted the sorry state of science in the pre-1949 period: "During the May Fourth era science and democracy were once promoted, but at a time when warlords fought over territories, science and democracy could be said to be both sinking." Using the development of meteorological stations as a specific example, Zhu argued again that things only changed after 1949 under the leadership of the CCP (Zhu [1962] 2004: 137).

With the start of the Cultural Revolution in 1966, the May Fourth was again highlighted as a political movement in Zhu's writings. In his famous 1973 paper on climate changes in Chinese history, he pointed out that some in ancient China had suspected that the climate would change but they did not provide any evidence until the development of scientific archeology "after the May 4th Movement, a movement of anti-imperialism and anti-feudalism in 1919, [when] a new spirit of revolution began to come to life in China" and especially after 1949, when "the teachings of Chairman Mao Tsetung [Mao Zedong] have set free the bounds of authoritarianism of the senior scientists, and a new generation of young men of science has begun to sprout up which makes the prospect of future advancement of science full of promise" (Zhu [1973] 2005: 534–535). His diary entry, on 4 May 1973, in which May Fourth appeared for the last time, indicated that he had, by then, evidently come to terms with the party-state's version of the historical event:

Today is the May Fourth holiday, marking fifty-four years since 1919. Yesterday there was a torch relay competition by youths in Beijing, with the participation of 15,000 Communist Youth League members. May Fourth Street, site of the square of the old Beijing University, resonated with bright songs, with 540 torches lighting up the western side of the square. The workers-peasant-soldier students of Beijing University were full of energy, and the Red Guards from the Middle School affiliated with Qinghua University handed the torches from one to the other. (Zhu 2005-2011: v. 21, 391)

But such examples of Zhu's acquiesce of the party line on the May Fourth should not be taken to be evidence of his abandonment of the liberal ideals of science and democracy. Even though he was "sidelined" during the Cultural Revolution he took advantage of every opportunity to advocate for basic scientific research within the CAS, which could have easily made him a target of the radical Red Guards who regarded the latter as bourgeois ivory tower exercises. In September 1968, at the height of the Cultural Revolution chaos, for example, Zhu wrote a letter to Premier Zhou Enlai (周恩来, 1898–1976) co-signed by Wu Youxun, who was now, like him, a "sidelined" vice president of the CAS. They advocated for the CAS to resume basic scientific research (Zhu and Wu [1968] 2004). Then in early 1970 he would reiterate his argument in a meeting with Liu Xiyao (刘西尧, 1916–2013), Premier Zhou's liaison in the CAS:

I believe that in the upcoming institutional reforms, our priority should be the strengthening of research resources in physics and chemistry in the Academy of Sciences, because physics and chemistry are the foundation of the foundation in the natural sciences. Last year Mr. Wu and I had written a paper for Premier Zhou (transmitted

by the CAS Revolutionary Committee), in which we mentioned this problem and pointed out that five chemical institutes of the academy were all taken over by the National Commission on Defense Science and Technology. Chairman Mao has proposed that it won't do without work on theories and asked for the formation of a theoretical corps both red and expert (December 1963). Comrade Chen Boda [陈伯达, 1904-1989] [then chairman of the Cultural Revolution Leading Group and another vice president of the CAS] also proposed in October 1964 at a meeting of the CAS Party Group, that the academy should focus on comprehensive, exploratory, and long-term problems. How can these problems be made compatible with production? On the surface they seem to be contradictory, because if they are exploratory, it is impossible to know how they would be connected with practice in the future. But I still think that if they are truly the most basic problems in the natural sciences, sooner or later they will be connected with practice. One such example is the problem of the structure of matter. (Zhu 2005-2011: v. 20, 7)

Zhu would doggedly pursue his advocacy for basic research in the CAS. In November 1970, he objected to a CAS policy document which called for the academy to carry out “national, comprehensive, and exploratory tasks,” arguing that “basic theoretical scientific problems are comprehensive projects, not only national but universal in nature” (Zhu 2005-2011, v. 20: 239). In early 1971, he lamented to Wu that the CAS had become a “clinic” focused on solving practical problems, forsaking its duty to advance science. “In the long run, without basic work, it will be impossible to catch up on world standards in scientific research,” as he noted in his diary on 23 February 1971 (Zhu 2005-2011: v. 20, 326). Even after Wu, probably disheartened, declined to join him, Zhu would continue his fight for basic research, writing a letter on the subject to CAS president Guo Moruo (郭沫若, 1892-1978) in January and February 1972 (Zhu 2005-2011: v. 21, 21-25, 34).

It was also within the repressive political environment of the Cultural Revolution that Zhu took some political risk by intervening in 1972 on behalf of Xu, who was, like Zhu Jin, purged in 1957-1958 as a rightist and was in the process of translating Albert Einstein's writings into Chinese while living in internal exile in rural Zhejiang province. Xu informed Zhu of the brazen plagiarizing of his translations by a rival group in Shanghai with connections to the “Gang of Four” then in power and sought his help in redressing the matter. Zhu did intervene on Xu's behalf in November 1972, which, remarkably enough, paved the way for the beginning of the publication of a three-volume set of Einstein's writings in Chinese translations by Xu and others in China even before the end of the Cultural Revolution in 1976. It in turn did much to popularize not only Einstein's scientific research but also his democratic ideals among Chinese readers. (Zhu 2005-2011: v. 21, 233-235; Xu 2006; Overbye 2006; Hu 2013)

Zhu remained a practicing scientist to the end. On 6 February 1974, while hospitalized in Beijing, he made the last entry in his diary, recording the day's weather information. Too weak to measure the temperatures with his own pocket thermometer as he had done for decades, he took care to note that the information came from the radio broadcast of the weather bureau, a scientific and technological infrastructure of modern China that he, perhaps more than anyone else, helped to establish (Zhu 2005-2011: v. 21, 562). He died the next day.

Thus, Zhu Kezhen lived through the May Fourth period as a scientist and educator returned from the US, and may have actually contributed to the May Fourth

movement, in its broad interpretation, through his teaching and research in universities and at the Academia Sinica, involvement in the Science Society, and popular science editorial work at the Commercial Press. But he did not see himself as a May Fourth iconoclast or think of it as an important milestone before 1949. This was probably partly because he, like many other practicing scientists in the Science Society, did not find Mr. Science and Mr. Democracy to be new to them. As Fan Hongye and I and others have argued, the Science Society with its *Kexue* magazine in many ways embodied both those ideals in its promotion of scientific research and in leading the way for organizing itself into a democratic civil society institution. Then there were elements in the complex May Fourth phenomenon that may have made politically liberal, culturally moderate scientists like Zhu and politically and culturally conservative scientists like Hu Xiansu to keep their distance from it. From at least his Harvard days Zhu had kept an interest in the history of Chinese science when he (and Yuen Ren Chao) took classes with George Sarton, a pioneer in the field. Shortly after his return to China he also started conducting research on Chinese meteorology and geography, making use of historical Chinese sources. This led, eventually, in 1973 to his study of Chinese climate change, in part based on phenological data gleaned from classical Chinese literature. He also played an important role in promoting the history of science as a profession in China both before and after 1949, including the founding of the predecessor to the current Institute for the History of Natural Sciences in the Chinese Academy of Sciences and also providing assistance to Needham's work on the history of Chinese science and technology.

Zhu's passions for valuable parts of the Chinese traditional culture were coupled with his appreciation for the positive influence of religion to lead him to harbor sympathy toward the conservative *Xueheng* group in its contestation with the leaders of the New Culture Movement. As both a practicing scientist and a nationalist who decided to stay under the Communists in 1949, it was perhaps not surprising that he would upgrade the May Fourth, especially its political significance, in keeping with Mao Zedong's official characterizations in the PRC era. Nevertheless, it is also plausible to argue that staying true to his identity as a practicing scientist and a Chinese patriot he tried in post-1949 to defend science bravely, under difficult conditions and at great personal political risk. He did so not only by repeatedly advocating for basic research in the CAS but also by his meticulous work on the paper on climate change at the end of his life. One can even see skillfulness in his use of the enhanced political status of the May Fourth, with all its ambiguity, as a resource to promote scientific research in the PRC. As he shifted his understandings of the May Fourth to protect his precarious position and fit the official interpretation, he persisted in advocating for science which constituted a continuity of his life before and after 1949. It was what he had tried to do for Chinese science, in his quiet and understated way and under difficult conditions in the Mao years, that has made him such a venerated figure in the Chinese scientific community even after his death in 1974. In 1980, Shi Yafeng (施雅风, 1919–2011) a glaciologist, and Xu Liangying, both graduates of Zheda during Zhu's presidency and underground communist organizers in the late 1940s, published a joint paper on Zhu in which they praised Zhu as "the model of an honest scientist" who "advocated for democracy" (Shi and Xu 1980: 2).

2 Fang Lizhi and the May Fourth

In contrast to Zhu Kezhen, who maintained ambivalence and distance in regard to the May Fourth, at least during his early years, and after 1949 vacillated between its revolutionary patriotic (anti-imperial, anti-feudal) and liberal (science and democracy) interpretations, Fang Lizhi seemed to have embraced it and its liberal interpretation from the beginning. And also, in a reversal of Zhu's path, Fang started his with a harmony between his understandings of the May Fourth and communism but saw them growing apart as he moved toward dissent amidst political conflicts both during and after the Mao years (Fang 2017).

Born in 1936 in Beijing, Fang grew up in a family where his father was a railroad worker and his mother, unusual in her time, believed in western, not traditional Chinese, medicine. While enjoying learning physics and making radio sets, he witnessed a beating of left-wing students by Beijing's Nationalist government police in 1947, which helped make him sympathetic toward the Communists and led him to join the communist-led Democratic Youth Alliance in 1949. The parity of communism and physics turned into a trinity, with love added to it, when he entered Beida in 1952, majoring in physics and met his physics classmate, fellow party believer, and future wife Li Shuxian (李淑娴, 1935-). Yet, as he reflected later, in 2007, even though the dominant ideology at Beida was Marxism, which he sincerely believed in, "elements of liberalism were still everywhere in the Beida campus, to be seen and to be felt." He recalled the popularity of the freedom-loving poets Alexander Pushkin of Russia and Heinrich Heine of Germany, as well as access to Soviet leader Nikita Khrushchev's exposition of Joseph Stalin's crimes and *Time* magazine's reporting on the anti-communist uprising in Budapest in 1956 (Fang 2007 [2017]).

Fang Lizhi did not mention the May Fourth as one of these liberal elements in this essay, but it's conceivable that he took it for granted that it formed part of the background. On another occasion, he recalled his Beida years and said that "it was a golden period for me and I learned so much, especially the spirit of democracy and independence at Beida, which has benefited me for the rest of my life" (Fang and Li 1999 [2017]: 75). If this could only be interpreted as an indirect acknowledgment of the May Fourth and its lasting legacy at Beida, then yet another reflection by Fang Lizhi (written in 1990 but published only in 2007) of his Beida experiences moved one step closer: "that intellectuals, at least those of us young people in this reading group [at Beida], would deviate from the communist ideology was because of the guidance of Mr. Science (赛先生)," a phrase directly associated with the May Fourth (Fang [2007] 2017: 183).

Fang's first act of dissent at Beida took place in 1955 when he led a group of physics students to disrupt a Communist Youth League meeting on campus. He pushed it to debate whether the university should cultivate "creative spirits" or produce model students (Fang 2017: 66–68). Protected by the generally moderate political environment at Beida at the time, Fang did not suffer from the incident and was actually admitted to the party and then recruited into the new nuclear physics specialty at Beida the same year. After graduation in 1956 Fang was made a member of the group working on nuclear reactors, as part of the Chinese atomic bomb project, in the Chinese Academy of Sciences. But he maintained regular

contact with Beida where his girlfriend Li Shuxian stayed on as a politically trusted interpreter for Soviet specialists (Fang 2017: 69-71).

It was in this Beida zone of relative freedom of information that Fang read, in 1957, a comment by the German physicist Werner Heisenberg criticizing Soviet physicist D. I. Blokhintsev's textbook on quantum mechanics. Heisenberg pointed out that Blokhintsev gave a physically questionable interpretation purely to make it agreeable to Lenin's philosophy. Convinced that Heisenberg was right, Fang resolved to choose evidence-based, skepticism-encouraging physics over faith-based political doctrines (Fang 2017: 76-77). It was physics that led him down the road of dissent.

This Beida bubble of relative freedom did not last. In 1957, the Anti-rightist campaign that Mao had launched to purge intellectuals snared both Fang and Li Shuxian. A letter they and another physicist friend Ni Wansun (倪皖荪, 1930-) had planned to write to the party central in defense of those students who had been persecuted for speaking out during the "contending" (争鸣) period had landed themselves in trouble: Li and Ni were persecuted as full-blown rightists and Fang was expelled from the party and removed from the nuclear project. After spending more than a year in hard labor in the countryside, Fang returned to Beijing, became an instructor at the University of Science and Technology of China (Keda), and married Li Shuxian in 1961 (Fang 2017).

During the Cultural Revolution both Fang and Li suffered inhuman treatment, but they survived. Forced to work in mines and having only a copy of the Soviet physicist Lev Landau's *Classical Theory of Fields* with him, Fang actually changed his research from nuclear physics and laser to relativistic astrophysics and cosmology at the height of the Cultural Revolution. Attacked by radical theorists as espousing reactionary bourgeois science against Marxist orthodoxy, Fang sought to study philosophy to fend off these attacks "like flies." Remarkably, both the cosmological papers by him and his research group at Keda, now exiled to Hefei in Anhui Province, and his philosophical defenses were able to get published in the later stage of the Cultural Revolution (Fang 1990: 25; Fang 2017: 164-177; Williams 1999: 71-75).

Both Fang and Li's political fortunes, like almost all those scientists who had suffered persecution during the Mao years, saw dramatic improvement after Mao's death and the end of the Cultural Revolution in 1976. Fang, because of his extraordinary persistence and achievements in astrophysical research during the Cultural Revolution, was now quickly recognized as one of the most prominent young Chinese physicists and was able to travel abroad to Italy, the UK, US, and Japan for visits and research. Appointed vice president of Keda in 1984, he grew bold in his outspoken criticism of political orthodoxy, starting with the continued attacks by orthodox theoreticians against novel scientific ideas such as that of the finite but boundless universe that had come out of modern cosmology (Miller 1996; Williams 1990).⁶ Using his overseas experiences as powerful resources, Fang's targets soon expanded to include corruptions within the party-state, the lack of democratic

⁶In 1982-1985, I was a graduate student in the program in the intellectual history of physics at the Graduate School of the Chinese Academy of Science in Beijing where Xu Liangying served as the main advisor and Fang Lizhi as a member of the supervisory committee (Wang 2014).

representation, the low living standards of scientists and other intellectuals, their lack of input in public policy-making, and the rigid educational system in the universities. At Keda he started experiments pushing against the accepted political limits, such as the removal of political guidance staff. By 1986 he became one of the best-known and popular advocates for reform and public speakers on university campuses all over China. In these efforts he received strong support from Xu Liangying who had bonded with him over their shared interest in Einstein, especially his democratic aspirations, and who was now back to the Chinese Academy of Sciences as a senior historian of science (Fang 2012; Xu 2016).

The May Fourth often featured prominently in Fang Lizhi's public advocacy for science, democracy, and eventually human rights. One can see the links with the My Fourth in the four objectives he established for Keda—science, democracy, independence, and creativity—and their contrast with the new party-state leader Deng Xiaoping's (邓小平, 1904–1997) four principles of socialism, proletariat dictatorship, party leadership, and Marxism-Mao Thought. In his first widely circulated campus speech, arranged by Xu Liangying and delivered on 27 March 1985 at Zheda, where Zhu Kezhen remained revered, Fang advocated for the freedom of press:

Newspapers should reflect the opinions of the public. Only when public opinion is truly respected will we have an environment that protects free thinking. (Of course, these ideas are nothing new. Cai Yuanpei said such things during the May Fourth era, when he was president of Beijing University. His statements at the time also stressed the need for diversity of opinion within a university.) (Fang 1990: 98)

When he talked about the importance of science and technology, especially the critical role of quantitative, evidence-based decision-making in the reform process, he invoked once again the May Fourth:

So, how are we to reform our society? Of course I can't answer this completely, but one thing that is clearly indispensable is science and technology. Way back in the May Fourth period, the battle cry was to save the nation through "science and democracy." So today I'll start with science, and wend my way onto democracy. (Fang 1990: 101)

On the problem of corruption, he pointed to democracy as a solution: "I think it [corruption] happens because our society is still feudalistic Only through democratic methods can this issue be dealt with" (Fang 1990: 120–121). One major proposal he had for deepening the reform was to enhance personal freedom: "We should at least advocate freedom of thought. Even Cai Yuanpei had so advocated, what are we afraid of?" (Fang [1985] 2017: 78).

In his speeches Fang Lizhi also emphasized the need for fuller opening up to the world by invoking the May Fourth. At a conference on political reform in September 1986 in Hefei, he declared that:

Why is it that for the last century there have always been those who insisted on "Using western methods but maintaining the Chinese essence" or comparable ideas? . . . I admire the spirit of the "complete westernizers" both before and after the May Fourth period, who had the guts to call for letting foreign ideas into China, where they could challenge what was not progressive in our culture Political reform demands fundamental changes in our thinking. (Fang 1990: 138–139)

When one participant during Q&A compared the Cultural Revolution to the May Fourth movement as being antitraditional, Fang made a spirited defense of the latter as a creative intellectual revolution:

There is a fundamental difference between them. The May Fourth Movement was anti-traditional in all ways. It introduced new natural science into China and absorbed the latest social theories from the west. Art and literature underwent drastic changes, humanistic thought was influential among intellectuals, and feudalism was dealt a serious blow. New thinking prospered from May Fourth right up to the War of Resistance against Japan, as anyone who studied modern Chinese history can tell you. But as a result of the Japanese aggression against China, the tide turned, and the study of Western culture was cut short This history should not be regarded as a failure of the May Fourth Movement, but rather as a consequence of the powerful grip of tradition. (Fang 1990: 152-153)

In contrast, the Cultural Revolution, he argued, “was by no means antitraditional in all ways. It propagated feudalism in the guise of Marxism” (Fang 1990: 153).

As a beneficiary of the “opening up” policy, Fang Lizhi felt that his experiences overseas helped to bring him closer to the May Fourth intellectual leaders such as the well-known writer Lu Xun (鲁迅, 1881–1936). In the Q&A following his speech on “Democracy, Reform, and Modernization” at Tongji University in Shanghai on 18 November 1986, he responded to a question about Lu Xun’s advice of reading foreign instead of Chinese books:

Lu Xun was one of the most radical figures of the May Fourth period. He was for complete westernization I think the mood of those people [in the May Fourth period] was desperate, and that their wish was for China to modernize very quickly. Their spirit is still worthy of our respect and admiration. As far as reading goes, I’d agree that you should read more foreign books. To go a step further, I hope that all of you have an opportunity to go abroad and have a look for yourself The change in many people’s outlook, including my own, came from seeing the outside world. (Fang 1990: 183)

Both Fang’s transnational experiences and his identity as a practicing scientist often came through in his popular speeches on science and democracy. At a gathering on 17 November 1986 at Jiaotong University in Shanghai, for example, he elaborated on the connections he saw between the “spirit of science” and the “spirit of democracy”:

Our past understandings of the spirit of science and the spirit of democracy had many faults Science is itself a kind of culture, and this culture brings with it a spirit that is not just a force of production The spirit of science refers to the spirit of searching for knowledge, searching for truth; it means that we recognize no authority that has to be followed blindly Marxism should not be regarded as a guidance in scientific research. In scientific research, we all search for the truth, without any external guidance, at least in my physics research I have never felt the need to be guided by Marxism In the last thirty odd years, as we all see, our values and standards have been often externally imposed: if someone in the government says that this article is good, valuable, it will become very popular In a democratic society it is the reverse; in advanced countries presidents cite professors’ writings First, we have to have scholarly independence; only then can we have the spirit of political independence. The spirit of science contained within itself the meaning of democracy and freedom. (Fang [1986] 2017: 264–266)

Thus to Fang, Mr. Science was intricately connected with Mr. Democracy not only because they would mutually benefit each other, but also because they shared values in freedom and independence.

Partly inspired by Fang Lizhi's infectious speeches, students staged protests against lack of democratic representation and official corruption, starting with Fang's own Keda and spreading to Beijing and Shanghai in short order, in scenes resembling in a way what happened on 4 May 1919. These protests in turn led to official suppression and political reprisals in late 1986 and early 1987. Fang was expelled from the party for a second time, removed from his vice presidency of Keda, and reassigned to the Beijing Observatory to separate him from the students. Liberal-minded party leader Hu Yaobang (胡耀邦, 1915–1989), who had tried to protect Fang, was forced to resign his general secretary's position. Fang continued to speak out on political issues, especially on the need to defend human rights as a central part of any democratic reform. On 4 May 1988, the 69th anniversary of May Fourth, he expressed his belief in the inevitability of China going with the tide of democracy and modernization in an address at the first so-called "lawn salon" on the Beida campus, which was organized by Wang Dan (王丹, 1969-), who would later become a leader of student protest the next year. "There does not exist such a thing as modernization with Chinese characteristics just as there does not exist a physics with Chinese characteristics" (Fang 1988, 25; Fang [1988] 2017).

Fang Lizhi and like-minded scientists continued to capitalize on the symbolic power of the May Fourth legacy in his political activism during 1989, which marked the movement's 70th anniversary and turned into one of the most fateful moments in modern Chinese history. On January 6, after completing a scientific paper on Supernova 1987A, Fang, remembering the Chinese tradition of emperors granting "general amnesties" when informed of ominous celestial occurrences like supernovae, decided to sit down and write a letter to Deng. In it, he mentioned the fact that the year marked significant anniversaries of the founding of the PRC (40th), the May Fourth Movement (70th), and the French Revolution (200th), and called on the party-state to issue a general amnesty releasing all political prisoners in order to generate "new hope" for the nation. Interestingly, the letter did not explicitly refer to the meanings of the PRC's founding or the May Fourth, but it did mention "liberty, equality, fraternity, and human rights" as universal values originating in the French Revolution. It was Mr. Science speaking up for Mr. Democracy (Fang 2017: 272–276).

Weeks later, inspired by Fang's letter, his friend and fellow dissident Xu Liangying, teamed up with Shi Yafeng again in organizing a collective appeal by intellectuals (Fang 2012; Xu 2016). It called for both broader democratic reforms and increased funding for basic scientific research. It gained the signatures of forty other leading natural and social scientists and writers. Most of the natural scientists co-signing the letter were indeed practicing and prominent scientists, including Wang Ganchang (王淦昌, 1907–1998), a nuclear physicist who had been a leader in the Chinese nuclear weapons program, Qian Linzhao (钱临照, 1906–1999), a senior solid-state physicist and long-time vice president of Keda who had supported Fang, Ye Duzheng (叶笃正, 1916–2013), a leading meteorologist and climate change scientist, Xu Guozhi (许国志, 1919–2001), a founding figure of operations research in China, and Jiang Lijin (蒋丽金, 1919–2008), an eminent chemist and

one of the few women among the signatories. This letter is believed to represent the first time that Chinese scientists as a group had spoken up on sensitive political issues in the PRC. Lengthier than Fang's letter, Xu's not only evoked the symbolism of the May Fourth but also explicitly referred to what it stood for: "If the above suggestions are adopted, it will be fortunate for our nation and people, [will lead to] the true realization and promotion of democracy and science that had been advocated by pioneers of the May Fourth Movement seventy years ago, and will create a happy atmosphere for the celebration of the fortieth anniversary of the PRC's founding" (Xu [1989] 2001).

Next, Fang got his chance to elaborate on his views on the prospects of Mr. Science and Mr. Democracy in China as he tried to situate the May Fourth in the long sweep of modern Chinese history. It turned out to be the last public speech Fang Lizhi would give in Beijing, which took place on 25 April 1989, at the Institute for the History of Natural Sciences, as part of its series of lectures to commemorate the 70th anniversary of the May Fourth Movement. Fang titled his talk "Looking at China's Democratic Journey from the Beijing Observatory: Commemorating 70 Years since May Fourth," and argued that the May Fourth marked both the end of the introduction of modern science in China (starting with the coming of the Jesuits in the late sixteenth century) and also the beginning of its journey toward democracy. Half seriously, he counseled for patience on the latter front:

This history of the introduction of science into China can perhaps help us understand the difficulties facing the introduction of democracy. First, one needs not to be too pessimistic about China's journey toward democracy; compared with the three hundred years that it took to have science introduced, seventy years [since 1919] in the introduction of democracy, while not too short, should still not make us lose hope. Second, the basic principles and standards of modernization and democratization are, like those in science, universal, with no distinction between "eastern" or "western" calendars, but only between backward and advanced ones, between correct and wrong ones. Third, the erroneous ideas that have frustrated the introduction of modernization and democratization into the Chinese culture are the same as those that frustrated the introduction of science into Chinese culture, i.e. various versions of "Chinese characteristics." (Fang [1989] 2017: 280)

When the reform leader Hu Yaobang's death in April 1989 triggered massive student protests in the Tiananmen Square in Beijing and the government tightened political control in response, Fang Lizhi, Xu Liangying, and their supporters found that their high hope for science and democracy at the beginning of the year increasingly dimmed. Even though he intentionally stayed away from Tiananmen and actually tried to persuade the students to stop their hunger strike in May and June, Fang, along with his wife, was still accused of being the "black hand" behind the movement by the government, citing, among other pieces of evidence, his open letter to Deng. Fearing for their lives in the chaos of the crackdown, they sought refuge in the US embassy in Beijing for over a year in 1989–1990 before they were finally allowed by the Chinese government to leave for England in exchange for the lifting of some economic sanctions imposed on China by the west and Japan at the time. Fang eventually became a professor of physics at the University of Arizona where he continued research and teaching in astrophysics and cosmology, including

mentoring students and scientists from China, while remaining active in human rights causes before his death in 2012 (Wines 2012).

Fang, like Zhu, practiced science to the end of his life. He passed away on 6 April 2012, while planning the Thirteenth Marcel Grossmann Meeting in astrophysics online with the Italian astrophysicist Remo Ruffini. As Ruffini wrote later in his tribute, “Up to the last ten minutes of his life, via Skype, Fang was working for science ... in the search for an understanding of the universe based on Einstein’s great ideas” (Ruffini 2014: 153). In the memorial writings that appeared publicly, mostly from outside of China but also a number from inside China, one of the common themes was that Fang embodied a combination of “Mr. Science” and “Mr. Democracy” (Hu 2016).

3 Conclusions

As we compare the views and experiences of Zhu Kezhen, Fang Lizhi and other Chinese scientists in relation to the May Fourth, what conclusions can we draw from them? One issue seems particularly worth of pondering is whether their scientific research had anything to do with their political activism, their relationship with the state, and thus their understanding of the legacy of the May Fourth.

Zhu Kezhen entered meteorology at its beginning as a professional scientific research field. Its development relied largely on the cumulation of empirical data, involving little theoretical work, and thus few incentives to get into philosophical issues that would bring its practitioners into direct conflict with an all-encompassing ideology such as Marxism. Such was the nature of Zhu’s research that he was able to make use of traditional Chinese records and even literature in his meteorological and geographical publications. He also often relied on the succeeding party-states running the national government to provide the human and material resources to establish and maintain meteorological observation networks. These features of the research of a practicing scientist like Zhu may have shaped his lack of enthusiasm for the May Fourth radicalism and his willingness to cooperate with the Communist party-state to achieve both his scientific and nationalist goals of developing science for national service.

In contrast, Fang Lizhi’s research, as a practicing scientist in modern relativistic astrophysics and cosmology, tended to be theoretical and brought him often directly into conflict with Marxist orthodox theoreticians. So, for him, the implied connection between Mr. Science and Mr. Democracy, as advocated by the May Fourth movement, became central in his scientific career. As he often explained in public speeches and published interviews in the 1980s, he was by nature and interest a scientist who was forced to engage in ideological and political contestations in order to carry on his research. Through these struggles he also came to realize that human rights, especially the freedom of thought and expression, were not only a fundamental part of the democratization of the Chinese society but also key to the protection of his scientific research.

There was another, generational dimension that may have accounted for the differences between Zhu and Fang in their understandings of the nature and legacy of the May Fourth. Like Zhu, Fang loved China, but did not want to make patriotism

as the most important value in his advocacy, which probably also reflected his experiences as a scientist of a younger generation living in a China not under immediate threat of foreign domination. “I agree with Einstein’s idea of world citizenship,” he said, “don’t be narrowly focused on your own country, look at things from a planetary perspective” (Fang 1990: 233). This was probably easier for a cosmologist than a meteorologist to do, even though both Zhu and Fang attempted to try their best to promote their understandings of the May Fourth ideals of science, democracy, and modernization in China (and Zhu also emphasized the global dimensions of modern science, including meteorology). In the end, despite their contrasting paths, divergent social contexts, and differing political challenges, as practicing scientists, they both took from and added to the legacy of the May Fourth with their persistent upholding of the ideal of Mr. Science. Furthermore, each in his unique way—not only Fang with his public activism but also Zhu with his quiet advocacy—contributed to the struggle for the ideal of Mr. Democracy in modern China as well.

References

- Chow, Tse-Tsung. 1960. *The May Fourth Movement: Intellectual Revolution in Modern China*. Cambridge, MA: Harvard University Press.
- Fan, Hongye 樊洪业. 1989. “Zhongguo Kexueshe yu xin Wenhua Yundong” 中国科学社与新文化运动 (“The Science Society of China and the New Culture Movement”). *Kexue* 科学 41 (2): 83–86.
- Fang, Lizhi 方励之. [1985] 2017. “Gaige Mantan: Zai Zhejiang Daxue de Yanjiang” 改革漫谈: 在浙江大学的演讲 (“Thoughts on Reform: A Talk at Zhejiang University”). In *Fang Lizhi Wenji* 方励之文集 (Collected Works of Fang Lizhi), vol. 2, 56–86. Taipei: EHG Books.
- Fang, Lizhi 方励之. [1986] 2017. “Tan Gaodeng Jiaoyu de Gaige: Zai Shanghai Jiaotong Daxue de Zuotanhui Shang de Tanhua” 谈高等教育的改革: 在上海交通大学的座谈会上的谈话 (“On Reforms in Higher Education: A Talk at a Symposium at Shanghai Jiaotong University”). In *Fang Lizhi Wenji* 方励之文集 (Collected Works of Fang Lizhi), vol. 2, 257–271. Taipei: EHG Books.
- Fang, Lizhi 方励之. 1988. “Minzhu yu Kexue” 民主与科学 (“Democracy and Science”). *Zhongguo Zhichun* 中国之春 August (63): 24–26.
- Fang, Lizhi 方励之. [1988] 2017. “Zai Xianggang Zhongwen Daxue Xinsheng Fudaoying yu Xuesheng Duihua” 在香港中文大学新生辅导营与学生对话 (“Dialogs with Students at the Orientation Camp for New Students at the Chinese University of Hong Kong”). In *Fang Lizhi Wenji* 方励之文集 (Collected Works of Fang Lizhi), vol. 3, 197–204. Taipei: EHG Books.
- Fang, Lizhi 方励之. [1989] 2017. “Cong Beijing Tianwentai kan Zhongguo Minzhu Jincheng: Jinian ‘Wusi’ 70nian” 从北京天文台看中国民主进程: 纪念“五四”70年 (“Viewing China’s Progress Toward Democracy from the Beijing Observatory: Commemorating the 70th Anniversary of the May Fourth”). In *Fang Lizhi Wenji* 方励之文集 (Collected Works of Fang Lizhi), vol. 3, 278–280. Taipei: EHG Books.
- Fang, Lizhi. 1990. *Bring Down the Great Wall: Writings on Science, Culture, and Democracy in China*, translated and edited by James H. Williams. New York: Knopf.
- Fang, Lizhi 方励之, and Li Shuxian 李淑娴. [1999] 2017. “Fang Lizhi Fufu Fangtan lu” 方励之夫妇访谈录 (“An Interview with Mr. and Mrs. Fang Lizhi”). In *Fang Lizhi Wenji* 方励之文集 (Collected Works of Fang Lizhi), v. 4, 75–86. Taipei: EHG Books.
- Fang, Lizhi 方励之. [2007] 2017. “Ziyou Zhuyi de Zhongjie he Gongchanzhuyi de Tuichao” 自由主义的终结和共产主义的退潮 (“The End of Liberalism and the Decline of Communism”). In *Fang Lizhi Wenji* 方励之文集 (Collected Works of Fang Lizhi), v. 4, 177–192. Taipei: EHG Books.
- Fang, Lizhi 方励之. 2012. “Xu Liangying Xiansheng Jiuzhi he” 许良英先生九秩贺 (“A Tribute to Mr. Xu Liangying on His 90th Birthday”). In *Huyu Minzhu yu Renquan: He Xu Liangying Xiansheng Jiushi Shouchen* 呼吁民主与人权: 贺许良英先生九十寿辰 (An Advocate for Democracy and

- Human Rights: Essays in Honor of Mr. Xu Liangying on His 90th Birthday), edited by Wang Zuoyue 王作跃, Liu Bing 刘兵, and Chen Hengliu 陈恒六, 14–19. Hong Kong: Mingjing chubanshe.
- Fang, Lizhi. 2017. *The Most Wanted Man in China: My Journey from Scientist to Enemy of the State*, translated by Perry Link. New York: Henry Holt and Company.
- Furth, Charlotte. 1970. *Ting Wen-Chiang: Science and China's New Culture*. Cambridge, MA: Harvard University Press.
- Hu, Danian. 2013. "Xu Liangying, 1920–2013." *History of Science Society Newsletter* 42 (3): 23–24.
- Hu, Ping 胡平. 2016. "Jishi Dexiansheng, Youshi Saixiansheng, Dangtui Fang Xiansheng" 既是德先生，又是赛先生，当推方先生 ("Mr. Fang as Both Mr. Democracy and Mr. Science"). In *Fang Lizhi Jinian Wenji: Renwen Juan* 方励之的纪念文集人文卷 (Fang Lizhi in the Humanities: A Memorial Collection), 98–100. Hong Kong: Mingjing chubanshe.
- Mao, Zedong. [1940] 1965. "On New Democracy." In *Selected Works of Mao Tse-Tung*, vol. 2, 339–384. Peking: Foreign Language Press.
- Miller, Alice L., (H. Lyman). 1996. *Science and Dissent in Post-Mao China: The Politics of Knowledge*. Seattle: University of Washington Press.
- Overbye, Dennis. 2006. "Xu Liangying: Einstein's Man in Beijing." *New York Times*, August 22, F1, F4.
- Ruffini, Remo. 2014. "From Mountain Tian-Shan to Heaven." In *Fang Lizhi Jinian Wenji Kexuejuan* 方励之的纪念文集科学卷 (Fang Lizhi in Science: A Memorial Collection), 147–154. Hong Kong: Mingjing chubanshe.
- Shen, Weiwei 沈卫威. 1999. *Huimou Xueheng pai: Wenhua Baoshou Zhuyi de Xiandai Mingyun* 回眸"学衡派": 文化保守主义的现代命运 (A Glance Back at the Xueheng School: The Contemporary Fates of Cultural Conservatism). Beijing: Renmin wenshe chubanshe.
- Shi, Yafeng 施雅风, and Liangying 许良英 Xu. 1980. "Zhu Kezhen Zhuanlue" 竺可桢传略 ("A Biographical Sketch of Zhu Kezhen"). *Zhongguo Keji Shiliao* 中国科技史料 1 (2): 1–25.
- Wang, Zuoyue. 2002. "Saving China Through Science: The Science Society of China, Scientific Nationalism, and Civil Society in Republican China." *Osiris* 17: 291–322.
- Wang, Zuoyue 王作跃. 2014. "Yiwei Jiechude Kexue Shijia, Kexue Zhaxuejia" 一位杰出的科学家、科学哲学家 ("An Outstanding Historian and Philosopher of Science"). In *Fang Lizhi Jinian Wenji Kexuejuan* 方励之的纪念文集科学卷 (Fang Lizhi in Science: A Memorial Collection), 343–348. Hong Kong: Mingjing chubanshe.
- Wang, Zuoyue. 2018a. "[Book Review of] Hongye Fan et al. 樊洪业等人, eds. Zhu Kezhen Quanji 《竺可桢全集》 (The Complete Works of Coching Chu)." *East Asian Science, Technology & Society* 12 (2): 201–209.
- Wang, Zuoyue. 2018b. "Theory Attached to Practice: Chinese Debates Over Basic Research from Thought Remolding to the Bomb, 1949–1966." In *Basic and Applied Research: The Language of Science Policy in the Twentieth Century*, edited by David Kaldewey, and Desiree Schaub, 228–247. New York: Berghahn Books.
- Williams, James H. 1990. "Fang Lizhi's Expanding Universe." *The China Quarterly* September (123): 459–484.
- Williams, James H. 1999. "Fang Lizhi's Big Bang: A Physicist and the State in China." *Historical Studies in the Physical and Biological Sciences* 30 (1): 49–87.
- Wines, Michael. 2012. "Fang Lizhi, Lodestar of Chinese Dissidents, Dies at 76." *New York Times*, April 8, A21.
- Xu, Liangying 许良英, and others. [1989] 2001. "Huyu Zhengzhi Minzhu de Lianmingxin" 呼吁政治民主的联名信 ("A Co-Signed Letter Appealing for Political Democracy"). In *Kexue, Minzhu, Lixing: Xu Liangying Wenji (1977–1999)* 科学•民主•理性: 许良英文集 (1977–1999) (Science, Democracy, and Reason: Collected Works of Xu Liangying, 1977–1999), 201–204. Hong Kong: Mingjing chubanshe.
- Xu, Liangying 许良英. 1993. *Zizhuan* 自传 (Autobiography), unpublished (courtesy of Xu Ping 许平).
- Xu, Liangying 许良英. 2006. "Huanxiang, Cuoze, Fansi, Tansuo: Botao Yisheng de Xinlu Licheng" 幻想•挫折•反思•探索: 波涛一生的心路历程 ("Aspirations, Setbacks, Reflections, and Explorations: My Stormy Life's Journey"). In *Hongyan Ernü* 红岩儿女 (Sons and Daughters of Hongyan), edited by Yan Ling 燕凌, Tong Shiyi 童式一, Mu Guangren 穆广仁, Song Cheng 宋铮, vol. 3, 199–229. Beijing: Zhongguo qingnian chubanshe.

- Xu, Liangying 许良英. 2016. "Tongdao Fang Lizhi" 痛悼方励之 ("Deeply Mourning Fang Lizhi"). In *Fang Lizhi Jinian Wenji: Renwen Juan* 方励之的纪念文集人文卷 (Fang Lizhi in the Humanities: A Memorial Collection), 6–10. Hong Kong: Mingjing chubanshe.
- Xue, Weimin 薛伟民, and Zhang Jijia 章基嘉 (eds. in chief). [1984] 2009. *Dangdai Zhongguo de Qixiang Shiye* 当代中国的气象事业 (The Meteorological Enterprise in Contemporary China). Beijing: Contemporary China Press.
- Zhu, Kezhen 竺可桢. [1936] 2004. "Daxue Jiaoyu zhi Zhuyao Fangzhen" 大学教育之主要方针 ("Major Policies on University Education"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 2, 332-338. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. [1950] 2004a. "'Wusi' Yilai Woguo Daxue Jiaoyu Neizai de Maodun" 五四以来我国大学教育内在的矛盾 ("Internal Contradictions in Our Country's Higher Education Since the May Fourth"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 3, 20-22. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. [1950] 2004b. "Zhongguo Kexue de xin Fangxiang" 中国科学的新方向 ("New Directions of Science in China"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 3, 23-25. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. [1955] 2004a. "Zai Huanying Yidali Wenhua Daibiaotuan hui Shang de Jianghua" 在欢迎意大利文化代表团会上的讲话 ("A Speech at the Ceremony Welcoming the Italian Cultural Delegation"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 3, 230-234. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. [1955] 2004b. "Zhongguo Jindai Kexue Lunzhu Congkan: Qixiangxue (1919-1949) xu" 《中国近代科学论著丛刊: 气象学 (1919-1949)》序 ("Preface to the Meteorological Volume in the Book Series on Modern Chinese Works in the Sciences in 1919-1949"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 3, 250-253. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. [1961] 2004. "Sixiang Zihuan" 思想自传 ("An Intellectual Autobiography"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 4, 87-102. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. [1961] 2008. "Xiwen Zhi" 希文之死 ("The Death of Xiwen [Zhu Jin]"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 15, 792. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. [1962] 2004. "Xikan Zuguo de Kexue Pengbo Fazhan" 喜看祖国的科学蓬勃发展 ("Viewing the Rapid Development of Science in the Motherland with Delight"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 4, 137-139. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢, and Wu Youxun 吴有训. [1968] 2004. "Zhi Zhou Enlai Hangao" 致周恩来函稿 ("A Draft Letter to Zhou Enlai"). In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 4, 391-393. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. [1973] 2005. "A Preliminary Study on the Climatic Fluctuations During the Last 5,000 Years in China." In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 5, 534-567. Shanghai: Shanghai keji jiaoyu chubanshe.
- Zhu, Kezhen 竺可桢. 2005-2011. *Zhu Kezhen Diary Volumes*. In *Zhu Kezhen Quanji* 竺可桢全集 (Complete Works of Coching Chu), vol. 6-21. Shanghai: Shanghai keji jiaoyu chubanshe.

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