

CARDOZO LAW REVIEW
de•novo

ZIZHU CHUANGXIN AND CHINA’S SELF-
DRIVEN INNOVATION: CALLING FOR A HOLISTIC
PERSPECTIVE

*Ken Shao**

TABLE OF CONTENTS

INTRODUCTION	168
I. A HOLISTIC PERSPECTIVE	172
A. <i>The Framework Behind a Holistic Approach</i>	172
B. <i>Identifying Non-Holistic Reasoning and Defining a Holistic Approach to China</i>	174
II. NEVER IGNORE THE HISTORICAL CONTEXT.....	177
III. DON’T FORGET THE INTERNATIONAL CONTEXT.....	181
IV. LET’S FACE THE DEVELOPMENT CONTEXT	187
CONCLUSION.....	192

INTRODUCTION

Innovation projects are skyrocketing in China. By 2020, self-driven innovation (*zizhu chuangxin*) might take China to a global

* Ken Shao earned a PhD from The University of London, an LLM from The University of London, and an LLB from Nanjing University. He currently serves as the Director of the Postgraduate Certificate in Chinese Law and Senior Lecturer at the Murdoch University School of Law in Australia. He is also an Adjunct Professor at Intellectual Property Centre, Zhongnan University of Economics and Law China and an Education Committee Member (WA) on the Australia-China Business Council.

innovation peak.¹ Yet, the concept of *zizhu chuangxin*, or what I call self-driven innovation, is still quite new to the wider international community. During 2009–10, when I conducted several studies on China’s national innovation strategies and policy incentives from a holistic perspective, it was difficult to find any literature on this topic in English legal scholarship.² A few works were available, in both English and Chinese, in the fields of economics, art, and politics. But they did not employ a holistic perspective, which is essential to facilitate a proper understanding of the contexts, purposes, and tendencies of China’s innovation progress.³ Nor did these works attract, as Peter Yu recently described, “the narrative about piracy” in China.⁴ In light of the absence of scholarship on the topic, and given the recent rise of China as a technological power, it is not surprising that since 2010 many more publications—surfing the waves of China’s high-tech and creative industries—have issued. Yet concurrent with China’s development, foreign concerns over China grow and a holistic perspective in the scholarship on China remains scarce.⁵

As a result, it is important to re-emphasize and further develop a holistic perspective on Chinese innovation. This Article seeks to expand that perspective and, especially, to make it more understandable for researchers who are unfamiliar with Chinese culture and history. Of

¹ One of the key indicators is that China’s innovative potential is ranked among the top ten. In particular, China’s innovative efficiency in terms of the growths of human resources, R&D input by companies, and financial support by government are ranked respectively top four, two, and four. Hua Yedi, *China’s Weak Innovative Capacity and Leading Innovation Potentials*, XINHUA NEWS, Feb. 3, 2010.

² See Ken Shao, *Patent Law, National Strategies and Policy Incentives: China’s Road to a Leading Innovator*, 14 INT’L TRADE & BUS. L. REV. 85 (2011) [hereinafter Shao, *Patent Law, National Strategies and Policy Incentives*]. A book published in 2006 by economists devoted one paragraph to China’s history of technology, but in the conventional and negative way. See SHULIN GU & MARK DODGSON, *INNOVATION IN CHINA: HARMONIOUS TRANSFORMATION?* 11 (2006). A holistic perspective aims at clarifying China’s motivation and directions in its innovation policies and thus at least needs to include a combined perspective of cultural, historical and international analysis. One notable exception used various statistics to analyze the relationship between Chinese patent law and innovation. However, it did not scrutinize what the imbalanced global intellectual property regime means to China’s innovation. See Linda Yueh, *Patent Laws and Innovation in China*, 29 INT’L REV. L. & ECON. 304 (2009). Recently, I further expanded my holistic perspective to include a broader historical perspective. See Ken Shao, *History is a Key Decoder: Why China Aims at Re-emerging as a Global Leader of Innovation*, LAW IN CONTEXT (forthcoming 2013) [hereinafter Shao, *History is a Key Decoder*].

³ One excellent exception in regard to a holistic perspective of history is an introductory portrait of China’s continuity and change in culture-knowledge economy from pre-history to modern China, possibly because China’s history of culture is more known than that of technology. See MICHAEL KEANE, *CREATED IN CHINA: THE GREAT NEW LEAP FORWARD* (2007).

⁴ Peter K. Yu, *The Rise and Decline of the Intellectual Property Powers*, 34 CAMPBELL L. REV. 525, 527 (2012).

⁵ One notable exception is a 2012 book containing insightful discussions of China’s creative industries and copyright. See LAIKWAN PANG, *CREATIVITY AND ITS DISCONTENTS: CHINA’S CREATIVE INDUSTRIES AND INTELLECTUAL PROPERTY RIGHTS OFFENSES* (2012).

course, the relevant topics of Chinese culture and history are extremely complex and lengthy, and thus impossible to fully cover in a single article. Yet, a basic framework can go a long way to guide the readers towards a holistic understanding of China's innovation progress and its relation to IP.

Before we begin to present a holistic perspective, it is important to define self-driven innovation (*zizhu chuangxin*). The English term innovation does not have a universally-accepted definition.⁶ In general, innovation refers to technological advancements in products and processes.⁷ While the term self-driven innovation in its Chinese context, too, refers to new inventions in certain industrial and technological areas,⁸ it attracts no interpretive difficulty to extend it to cover cultural and creative industries as well. *Chuangxin* means creating newness, and this may include knowledge creativity as a whole.⁹ For the benefit of simplicity, such a broad definition of innovation is used in this Article.

An even more confusing term is *zizhu* itself, which captures the senses of “original,” “independent,” and “ownership.”¹⁰ Often the term *zizhu* is translated as “indigenous”¹¹ and is confused—in ideological, non-holistic stereotypes—with “self-reliance” (*zili gengsheng*), a Maoist policy.¹² There is also a rarely-adopted translation: “sovereign innovation”.¹³ The term sovereign is highly insightful, but, when it

⁶ PHILIPP HERZOG, OPEN AND CLOSED INNOVATION: DIFFERENT CULTURES FOR DIFFERENT STRATEGIES 9 (2d ed. 2011).

⁷ OECD, OSLO MANUAL: THE MEASUREMENT OF SCIENTIFIC AND TECHNOLOGICAL ACTIVITIES, PROPOSED GUIDELINES FOR COLLECTING AND INTERPRETING TECHNOLOGICAL INNOVATION DATA 28 (2d ed. 1997).

⁸ Self-driven innovation is normally defined to include subject matters such as computers and their applications, telecommunication products, software, modern office appliances, new-energy equipment, energy-efficient products, and so on. For instance, see *The Notice of Starting National Self-Driven Innovation Accreditation (Consultation Paper) 2010*, MINISTRY OF SCI. & TECH. OF THE PEOPLE'S REPUBLIC OF CHINA (Apr. 9, 2010), available at www.most.gov.cn/tzgt/201004/t20100409_76710.htm.

⁹ In fact, as Michael Keane notes, creativity joined innovation in government discourse in China in 2006. MICHAEL KEANE, CHINA'S NEW CREATIVE CLUSTERS: GOVERNANCE, HUMAN CAPITAL AND INVESTMENT I (2011) [hereinafter KEANE, CHINA'S NEW CREATIVE CLUSTERS].

¹⁰ Tian Lipu has defined *zizhu* as “belonging to oneself, human created and new.” *SIPO Director Tian Lipu on the Important Role of Patent System*, THE CENTRAL PEOPLE'S GOVERNMENT OF THE PEOPLE'S REPUBLIC OF CHINA (Jan. 9, 2006), http://www.gov.cn/zwhd/2006-01/09/content_151769.htm.

¹¹ “Indigenous” is the official term used by the U.S. government. For instance, see U.S. INT'L TRADE COMM'N, INV. NO. 332-519, USITC PUB. 4226, CHINA: EFFECTS OF INTELLECTUAL PROPERTY INFRINGEMENT AND INDIGENOUS INNOVATION POLICIES ON THE U.S. ECONOMY 5-5-5-9 (2011) [hereinafter ITC 2011 REPORT].

¹² Mao Zedong's self-reliance policy was a left-wing overarching policy framework that isolated China from the capitalist world. It is widely believed that Deng Xiaoping's reformist change was a reaction to this policy. For a comprehensive study, see Fredrich W. Wu, *Socialist Development of Self-Reliance Within the Capitalist World Economy: The Chinese View in the Post-Mao Era*, in THE END OF AN ISOLATION: CHINA AFTER MAO 234-36 (Harish Kapur ed., 1985).

¹³ *Will China Protect Intellectual Property? New Developments in Counterfeiting, Piracy,*

comes to the current Sino-West relations, is also somewhat politically overdosed. It is insightful because the global IP regime is being eroded by private interest of big companies through various channels and the principle of sovereignty is much needed in IP governance by all national governments, especially those in developing countries, to combat the threat of global private interests.¹⁴ Without domestic innovation, a country may lose long-term development competitiveness in this global IP regime.¹⁵ For this reason, *zizhu chuangxin* in China does have a sovereignty agenda: domestic innovation is essential to any country's ongoing success, and China is no exception.

However, the term *zizhu* is arguably more concerned with commercialization and development, than simply with sovereignty. The argument that the modern Chinese economy must shift from labor-intensive to knowledge-based is now being widely debated in China. And this economic transition has become a central government policy in which innovation plays a crucial role.¹⁶ As such, this Article proposes using the term self-driven (*zizhu*) to encompass all of the innovation-related sovereignty issues, competitiveness, and development agendas of a nation. Sometimes, I may simply use innovation without adding self-driven when the term is self-explanatory in the context.

To present a holistic view approachable by both Western and

and Forced Technology Transfer: Hearing Before the Cong.-Exec. Commission on China, 111th Cong. 40–41 (2010) (statement of Richard P. Suttmeier) [hereinafter Statement of Richard P. Suttmeier].

¹⁴ For an unprecedented and first-hand study of the global private governance of intellectual property, see PETER DRAHOS, *THE GLOBAL GOVERNANCE OF KNOWLEDGE: PATENT OFFICES AND THEIR CLIENTS* (2010) [hereinafter DRAHOS, *THE GLOBAL GOVERNANCE OF KNOWLEDGE*].

Administering a patent system is one of the few areas of intellectual property over which developing countries have considerable sovereign discretion. Patent offices might be one place in which one might find developing-country resistance to the hegemony that the US, EU and Japan exercise over patent standard-setting processes. Instead, I found that developing-country patent offices were being deeply integrated into a system of patent office administration that was being led by the patent offices of the US, EU, and Japan. So while developing-country negotiators would contest the standard-setting games of the US, EU, and Japan in places like the World Trade Organization (WTO) and the World Intellectual Property Organization, their patent offices were closely and quietly cooperating with the patent offices of these three countries.

Id. at xiv.

¹⁵ As Yale University Professor Jack Balkin pointed out, “because not all countries participate in the global economy equally, not all of their citizens enjoy its benefits equally.” Jack Balkin, *What is Access to Knowledge?*, Presentation at the Yale Information Society Project Access to Knowledge Conference (Apr. 21, 2006), available at <http://balkin.blogspot.com/2006/04/what-is-access-to-knowledge.html>.

¹⁶ This is clearly reflected in the National Medium and Long-Term Guideline for Science and Technology Development Plan 2006–2020, which is one of the most important policies for China's self-driven innovation. As it states, “by 2020, the progress of science and technology will contribute 60 percent or above to the country's development.” For further details, see *China Issues Guidelines on Sci-Tech Development Program*, CHINA.GOV.CN (Feb. 9, 2006), http://www.gov.cn/english/2006-02/09/content_184426.htm.

Chinese audience, this Article will first discuss the forces operating against a holistic view of China and explain exactly what it means to employ a holistic view. Then, by emphasizing the historical, international, and developmental contexts, the Article aims to introduce the reader to real examples of a holistic perspective, and in turn, to re-frame the discourse around China's self-driven innovation.

I. A HOLISTIC PERSPECTIVE

A. *The Framework Behind a Holistic Approach*

A holistic perspective of China's IP and innovation strategies and developments is not simply a stylistic approach. Rather, it is a necessary approach to analyzing IP and innovation in China. There is a long way to go in order to have a proper understanding of the Chinese context and history that informs these issues—and such conversations to get those in the West, and, in fact, widely within China, in line with a holistic perspective need to be steadily engaged at various levels. Understandably, for the wider Western world, the possibility of an innovative China may appear to be a sudden shift in international innovative power, and possibly, another earthshaking blow to hit the West amid China's massive outbound investment in the Global Financial Crisis Era.¹⁷ This fear of China's growth is only worsened when an ideological non-holistic mindset flashes by, linking the term *zizhu* (self-driven) to the Maoist term *zili gengsheng* (self-reliance).¹⁸

Thus, it is not surprising that Western critics have used the term “techno-nationalism” to describe the nature of China's current efforts in self-driven innovation.¹⁹ For many, “self-reliant” or “indigenous” innovation is at odds with globalization and sings a left-wing or nationalist ringtone. Here vigilance over things like military technologies, cyber security, and tech-spying inevitably proliferate.²⁰ In fact, keywords such as threats, unequal treatment, government procurement, subsidies, preferential lending, Chinese technical standards, and patent infringement appear frequently in the U.S.

¹⁷ China's outbound investment has been a major global phenomenon since 2008. This is particularly true in Australia and Africa. For a recent report, see *China's Outbound Investment Leaps to Record High in December*, CNBC (Jan. 17, 2013), <http://www.cnbc.com/id/100389317>.

¹⁸ For an interesting and “semi-holistic” perspective, see David Kerr, *Has China Abandoned Self-Reliance?*, 14 REV. OF INT'L POL. ECON. 77 (2007).

¹⁹ Richard Wallace, *China Eyes 'Creative' Industries in IP Push*, ELEC. ENG'G TIMES, Aug. 29, 2005, at 1.

²⁰ For an interesting book along these lines, see ADAM SEGAL, *ADVANTAGE: HOW AMERICAN INNOVATION CAN OVERCOME THE ASIAN CHALLENGE* (2011). Recently, such fear led to the Australian government's ban on China Huawei's bid in the AU\$38 billion Australian National Broadband Network. For a report on the event, see Geoffrey Barker & David Ramli, *China Giant Banned from NBN*, AUSTL. FIN. REV., Mar. 26, 2012, at 1.

government's official reports on innovation in China.²¹

The use of these keywords reflects Western reactions to the re-rise of China as an innovation force. These reactions are very understandable, but are rooted in a dualistic, disconnected, and quite messy world view. Excessive talk on China's piracy and weak enforcement of foreign IP rights dominates the Western conversation on China, yet this heavy emphasis is insular. The focus on these issues ignores the international context under which the world's knowledge economy favors the interest of big players and overlooks the development agendas and autonomy of developing countries.²² On the other hand, specific focuses on the grand policies and economic scales of China's self-driven innovation without a holistic perspective can easily lead many to a psychological fear of the "yellow peril," or what Samuel Huntington doomed, "the clash of civilizations."²³

The term holistic may include everything that is relevant.²⁴ However, in the discourse of China affairs, I particularly equate holistic to what I often call the "true China knowledge."²⁵ By true China knowledge I mean an informed perspective on Chinese events that is rooted in a deep and holistic understanding of the country's culture and history. Overall, true China knowledge remains extremely poor in Western countries, as well as in China. For instance, is *guanxi* a Chinese value?²⁶ Did China have no understanding of rule of law in its own tradition? Where is China's current transition heading to? The scarcity of true China knowledge in part accounts for many missteps of bilateral, cultural and economic policies—with Australia's resource industry as a classic and most recent example.²⁷

²¹ See, e.g., ITC 2011 REPORT, *supra* note 11. These terms also appear in Congressional hearings on China. See *China's Indigenous Innovation Trade and Investment Policies: How Great a Threat?: Hearing Before the Subcomm. on Terrorism, Nonproliferation, and Trade of the H. Comm. on Foreign Affairs*, 112th Cong. 69–70 (2011) (statement of Thea Mei Lee, Deputy Chief of Staff, Am. Fed'n of Labor and Cong. of Indus. Orgs.).

²² For further details, see DRAHOS, *THE GLOBAL GOVERNANCE OF KNOWLEDGE*.

²³ SAMUEL P. HUNTINGTON, *THE CLASH OF CIVILIZATIONS AND THE REMAKING OF WORLD ORDER* (1996). "In this new world, local politics is the politics of ethnicity; global politics is the politics of civilizations. The rivalry of the superpowers is replaced by the clash of civilizations." *Id.* at 28.

²⁴ A holistic perspective is not limited to China's innovation economy, law, and policies. I have applied this perspective to various trans-disciplinary matters. Innovation, however, represents a key agenda of China's economic future and thus is an area that urgently requires a holistic perspective.

²⁵ I use this invented term when discussing China-related issues. For further discussion, see Ken Shao, *The True China Knowledge that Australian Businessmen Should Know*, CHINA-AUSTL. ENTREPRENEURS, Sept. 2010, at 26–29 [hereinafter Shao, *True China Knowledge*].

²⁶ "Guanxi" is a quite unique business culture in today's China and can be broadly defined as drawing on connections in order to secure favors in personal relations. For further studies, see Yadong Luo, *GUANXI AND BUSINESS 2* (2000).

²⁷ The Australian business communities have also unanimously agreed that their own understanding of China is slim. This has been confirmed by the dialogue I have witnessed first-

B. Identifying Non-Holistic Reasoning and Defining a Holistic Approach to China

The typical non-holistic reasoning works in a two-step process. First, its short-sighted lens searches the normalcy of China only from the framework of a nineteenth-century China under the challenge of the then-rising Western Powers, the Chinese “low-end” tradition that feeds the West with distorted China images,²⁸ or transitional China’s ongoing perplexing dilemmas.²⁹ Second, it satisfies itself in this illusive normalcy and ignores other facts, believing that China is just like the distortive images present it to be and has always been that way. Max Weber (1864-1920)’s work perfectly reflects this two-step reasoning. Without any direct contact with China, he made up a normalcy by relying on several travellers’ descriptions of China’s low-end culture in the late nineteenth century.³⁰ Weber, of course, had little idea that capitalism had in fact existed earlier in China.³¹

Reasoning in the modern discourses around IP piracy in China follows exactly the same two-step, non-holistic process: first, people are only familiar with contemporary China’s rampant piracy industry; second, by looking at contemporary China’s rampant piracy industry, people believe that piracy has always been this way in China’s history. This reasoning process gravely misunderstands Chinese cultural and legal history. The consequence is inevitably a cumulated self-reassurance, which claims that China’s numerous problems today are so deeply rooted in its own history and culture that they may create big threats to the world, especially when China’s post-1949 institutions

hand in numerous business seminars that I have attended.

²⁸ China’s high-end tradition, which is really the source for understanding the Chinese culture, remains largely unfamiliar to the Westerners. The difference between low-end and high-end traditions was originally proposed by Xu Fuguan, one of the leaders of the second generation of Neo-Confucian studies. See Xu Fuguan, *On Tradition*, in *SELECTED ESSAYS OF XU FUGUAN* 99–110 (1980). In Xu’s dichotomy, the high-end tradition refers to cultural and intellectual tradition among the intellectuals while the low-end tradition belongs to what normal people apply without self-consciousness. What Xu tried to explain is probably the phenomenon that many elegant, rational, and highly developed traditions have been lost, distorted, or wrongly practiced in late imperial China.

²⁹ This can also be called the culture-explanation perspective. See Ken Shao, *The Global Debates on Intellectual Property: What if China is not a Born Pirate?*, 2010 *INTELL. PROP. Q.* 341, 349–351 [hereinafter Shao, *The Global Debates on Intellectual Property*].

³⁰ Two famous books of Max Weber are relevant: *MAX WEBER, THE PROTESTANT ETHIC AND THE SPIRIT OF CAPITALISM* (Talcott Parsons trans., 1962); *MAX WEBER, THE RELIGION OF CHINA: CONFUCIANISM AND TAOISM* (Hans H. Gerth trans. & ed., 1968).

³¹ For instance, there are studies on capitalism in sixteenth and seventeenth century China during the late Ming Dynasty. *MING QING ZIBEN ZHUYI MENGYA YANJIU LUNWEN JI* [ESSAY COLLECTIONS OF THE STUDIES ON EMBRYONIC CAPITALISM OF THE MING AND QING] (Institute of Ming and Qing History of Nanjing University ed., 1981). Whether the term “embryonic” is contestable, as the book was written during China’s left-wing period.

have remained heterogeneous with the Western model.

The above phenomena have complex external and internal inducements. In addition to myopia in the post-Cold War aftershock, racism might be another one. A pioneer book, *Fu Manchu and the Yellow Peril*, demonstrates that the confounded and long-entrenched ideology against the Chinese had been hideous, for many decades, in thousands of English works of fiction.³² Although blatant racism has since been dispelled, its impact remains. Older Western generations were immersed in Fu Manchu audiovisuals, just as their Chinese peers were dyed in the red ocean of the Cultural Revolution. These early memories do fertilize adult mentalities. A rising China, or a *re*-rising China, might create a subtle feeling of tension within Westerners, *if* China is only perceived in disconnection, fragmentation, and ideology—a perspective this is locked in the past and shaped by imagery.

But racism and political myopia are *not* the ultimate causes of the lack of the holistic perspective of China. The rise of the modern West has underpinned—in a psychologically inevitable way—a sense of Eurocentric superiority, which tends to ignore and marginalize other cultures. Racist and political stereotypes are *consequences* of this Eurocentric feeling of superiority, not the cause. *Nor* indeed is superiority itself the cause.³³ As early as the seventeenth century, China had failed to do well to impress the Western world. The Fu Manchu images do sketch some features of the Manchu Qing Period (1644–1912), which culturally and institutionally disconnected itself from the authentic Chinese civilization that was far more developed but continues to have much to be appreciated by modernity.³⁴ Creativity and technologies in the Qing Period were also far less advanced than its predecessor periods. The Qing Period was a crucial turning point during which China drastically declined and Europe, Japan, and some other Asian countries changed from *Sinophilie* (praising China) to *Sinophobie* (despising China).³⁵ This historical downside is one of the *ultimate* causes of the scarcity of true China knowledge.

Further entrenching the disconnect, post-Manchu revolutions, including Dr. Sun Yet-sen's, did not really focus on *re-connecting*

³² JENNY CLEGG, *FU MANCHU AND THE YELLOW PERIL: THE MAKING OF A RACIST MYTH* (1994).

³³ The phenomenon of Western superiority as a natural process is uniquely analyzed in Ken Shao, *The Two Londons That I Love*, *CHINESE SCHOLARS*, Nov. 2008, at 28–29.

³⁴ The Qing might have fundamentally changed China's political system into an extreme form of despotism. See QIAN MU, *THE GAIN AND LOSS OF CHINESE POLITICAL AFFAIRS IN HISTORY* (2001).

³⁵ For a landmark work on the disconnection caused by Manchu's abandonment of some fundamental elements of Chinese culture, see Ge Zhaoguang, *Drifting Away: the Disconnection between Mid-Qing China and Japan and Korea*, 9 *SHU CHENG* 46–50 (2004).

China to its authenticity.³⁶ The Chinese intellectual and political communities either rejected or insisted on the forms of Chinese culture readily around them, without realizing that their subject matters were often relevant mainly to the Qing legacies.³⁷ For instance, much of the orthodox Confucianism under attack was only exemplified during the Qing Period whilst Confucianism as a whole was the receiver of criticisms.³⁸

When the Qing comet left, its long tail continued to cover the Chinese, including their China towns—the initial target of Fu Manchu fictions—and to direct China away from re-connecting with its authentic culture and heritage. In Mainland China, this situation was further worsened when Mao's extreme Leftist campaigns devoted themselves to annihilating Chinese culture. These negative legacies among Mainland China and overseas have resulted in contemporary Chinese misconception of their own culture, which is subsequently transmitted to foreigners through globalization.³⁹ The scarcity of true China knowledge is fundamentally related to this complex modern history of China.

Whatever the causes are, the practical solution depends on whether we are willing to accept hard facts. This may be difficult as the inertia of Eurocentrism can be long-lasting. As Karen Turner noted, despite the availability of many new historical findings since Max Weber's nineteenth-century misconstruction of China, many Sinologists have continued to remain intoxicated with a Weberian mentality.⁴⁰ It is indeed an intellectual and psychological challenge for many people, including the Chinese, to develop a holistic perspective of China when Chinese images are full of interwoven misconceptions and transitional

³⁶ Interestingly, the first of three underlining political principles of Dr. Sun Yet-sen's republican revolution was nationalism, which aimed at expelling the northern barbarians (Manchu). However, Dr. Sun's revolution did not lead to necessary cultural revival. As a consequence, the radical New Culture Movement influenced by American liberalism and Russian communism soon spread across China, just a few years after the collapse of Manchu Qing in 1911. The New Culture Movement was successful in criticizing the so-called Chinese culture and tradition, which, in fact, largely belonged to the low-end tradition Xu Fuguan described. See Xu Fuguan, *On Tradition*, in *SELECTED ESSAYS OF XU FUGUAN* 99–110 (1980). The low-end tradition, as argued by this paper, can largely be founded in Qing Dynasty's version of Chinese culture and certainly cannot represent the more advanced Chinese culture that had existed. For an insightful book about the New Culture Movement, see TSE-TSUNG CHOW, *THE MAY FOURTH MOVEMENT: INTELLECTUAL REVOLUTION IN MODERN CHINA* (1960).

³⁷ Some leaders of the second generation of Neo-Confucianism, however, made some philosophical, not institutional, efforts to reconnect. For a discussion, see YINGSHI YU, *DEMOCRACY, HUMAN RIGHTS AND CONFUCIAN CULTURE* (2000).

³⁸ Ping-ti Ho, *The Significance of the Ch'ing Period in Chinese History*, 26 *J. ASIAN STUD.* 189, 192 (1967).

³⁹ The funny understanding of Chinese culture among Australian resource industries is a good example.

⁴⁰ KAREN TURNER & GAO HONG-JUN, *AMERICAN SCHOLARS ON CHINESE LEGAL TRADITION* 16 (He Wei-fang ed., 1994).

dilemmas in complicated domestic and international contexts.

II. NEVER IGNORE THE HISTORICAL CONTEXT

A holistic perspective of China's self-driven innovation needs to start with a proper understanding of history. Holding our historical treasure map, we will not stop at the Cold War or the China-West conflicts in the nineteenth and twentieth centuries. Rather, our precise destination is where China's self-driven innovation and Chinese *high-end* cultural DNA converge. Here is where my holistic perspective of China's history of innovation, creativity, and IP—which is widely ignored in Western, and even Chinese, communities—is located.⁴¹

The Chinese are often described as copycats. This conventional impression, at least in Western IP sectors, is derived from William Alford who argued that “the power of past” is overwhelming in Chinese history.⁴² This theory of the past led Alford to claim that “the replication of particular concrete manifestations . . . by persons other than those who first gave them form *never carried* . . . the dark connotations . . . [as] it does in the West.”⁴³ It must be pointed out that Alford did not reject the existence of innovation and creativity in Chinese history.⁴⁴ However, in his thesis, this point is too faint to attract any attention of both Western and Chinese readers who have no substantial knowledge of Chinese culture.

A matter with immediate relevance to the above is the state of IP in China. Contemporary China's controversial record in infringing foreign IP rights naturally leads Western countries to believe that the Chinese are really copycats by their cultural DNA and most definitely have never developed any indigenous notion of IP. Political control, as Alford argued, had been the central agenda in traditional China, making a policy of strong IP rights impossible to indigenously grow.⁴⁵ Embracing this view, Western scholars widely believe that Chinese aesthetic preference for imitation is difficult to reconcile with international IP standards.⁴⁶ These extremely fancy expressions reflect a

⁴¹ See e.g., Shao, *The Global Debates on Intellectual Property*, *supra* note 29; Ken Shao, *Ingeniousness Excelling Nature: Inventors, Incentives and Technology Distribution Mechanism in Traditional China* (forthcoming 2014) [hereinafter Shao, *Ingeniousness Excelling Nature*]; Ken Shao, *Alien to Copyright?: A Reconsideration of the Chinese Historical Episodes of Copyright*, 2005 INTEL. PROP. Q. 400 [hereinafter Shao, *Alien to Copyright?*].

⁴² For his detailed discussion, see WILLIAM P. ALFORD, *TO STEAL A BOOK IS AN ELEGANT OFFENSE: INTELLECTUAL PROPERTY LAW IN CHINESE CIVILIZATION 19–29* (1995).

⁴³ *Id.* at 28.

⁴⁴ *Id.* at 22.

⁴⁵ *Id.* at 16–17.

⁴⁶ The following wording is very typical: “The Chinese esthetic preference for imitation is difficult to reconcile with the Berne Convention's prohibition of illegitimate reproduction and respect for innovation.” Susan Tiefenbrun, *A Hermeneutic Methodology and How Pirates Read and Misread the Berne Convention*, 17 WIS. INT'L L.J. 21, 22 (1999).

popular, disconnected, and messy impression of China in Western communities.

Unfortunately, without rich and vivid pictures of China's history and culture of innovation, creativity, and IP, the materials available to a skeptical Western mind for weaving a self-convincing Chinese picture are no more than political regime, copycat behaviors, infringement activities, flea market sales, burned pirated DVDs, and technonationalist policies.⁴⁷ By comparison, when discussing the creative achievements of the West, grand filmic scenes such as the Renaissance, *the Statute of Anne*, the Industrial Revolution, or Thomas Edison's light bulb quietly linger around the conversation. We have to admit that, as the post-structuralist Edward Said stated, no production of knowledge in the human sciences can ever ignore or disclaim the author's involvement as a human subject in his own circumstance.⁴⁸

The "image theory" employed above is psychologically true and is one of the methodologies I created to support my research in China-related issues.⁴⁹ It emphasizes the importance of micro-historicity and interdisciplinary approaches. For instance, in attempting to understand China's copyright history, it is too obscure to crassly cast China as a loyalist to imperial power. Micro-level details such as the size of Chinese publishing industry, the scale of free trade, the context of rational political control measures, and Chinese authors' attitudes towards creativity and copyright must be examined. One question, for example, is why the sixteenth-century Chinese publishers with business sizes larger than those of their counterparts in London had developed copyright practice that did not contain the monopolistic nature of the London copyright claimers?⁵⁰ Such examination can only happen in an interdisciplinary manner, requiring, in the first place, a thorough investigation into Chinese histories of philosophy, art, poetry, commerce, and technology.⁵¹

To put it a simple way, IP practices emerged in traditional China in tune with the nation's economic, technological, and cultural progresses. In fact, when the U.S. attempted to push China to join the *Paris*

⁴⁷ In a very different ideological niche, Chinese scholars often refer to other keywords that are heavily influenced by the left-wing ideology of the radical New Culture Movement in China in the 1910s. See, e.g., Liwei Wang, *The Chinese Traditions Inimical to the Patent Law*, 14 NW. J. INT'L L. & BUS. 15 (1993).

⁴⁸ For Said's post-structuralist view, see EDWARD SAID, *ORIENTALISM* (1978).

⁴⁹ A similar methodology was developed in psychology but for analyzing the role of images in decision making. See Lee Roy Beach, *Broadening the Definition of Decision Making: The Role of Prechoice Screening of Options*, 4 PSYCHOL. SCI. 215 (1993).

⁵⁰ For a detailed discussion of the fundamental differences in Chinese and British copyright monopoly, see Ken Shao, *The Promotion of Learning in Chinese History: to Discover the Lost Soul of Modern Copyright*, 24 COLUM. J. ASIAN L. 63 (2010) [hereinafter Shao, *The Promotion of Learning in Chinese History*].

⁵¹ For a succinct analysis, see Shao, *supra* note 29, at 352–54.

Convention in the late nineteenth century, the Chinese officials and scholars who resisted were not at odds with copyright law in itself, but believed that China needed flexibility in its copyright policy in order to continue importing foreign books⁵²—a “developing-country agenda” that was heavily used by the U.S. itself in the 1840s and can easily stimulate the release of compassion hormones among many IP scholars today.

With regard to innovation and creativity, it needs to be reiterated that a fundamental nature of Chinese philosophy is creativity—the ultimate driving force of the universe. Landmark Chinese philosophers, authors, and poets were often faultfinders of creative power, claiming the necessity of creating new ideas that had never been thought of by any predecessors.⁵³ Readers should not associate these Chinese views on creativity with a conventional belief that the Chinese favor “collaborative production,”⁵⁴ a term relating to collective work or ownership. Rather, the concept of “individual” author or creator clearly existed in traditional China, often without conflict with scholarly collaboration and knowledge sharing.⁵⁵ Inventors were regarded as sages and governmental efforts in promoting innovation and technology distribution were impressive.⁵⁶ The Chinese classic understanding of the incredible intelligence of inventors is strikingly similar to a famous saying of the renowned nineteenth century German composer, Robert A. Schumann: “talent works, genius creates.”⁵⁷ What then can explain why China had remained a world economic leader for centuries? The simple answer is that sought-after Chinese exports in the global market were not simply “made in China,” but “designed in China.” Even a specific color on a piece of porcelain meant cutting-edge technology that other countries had obvious difficulties to duplicate.⁵⁸

Yet, the Chinese talent in innovation *had* subsequently been lost for centuries due to internal and external factors that are too complex to

⁵² For various historical texts, see ZHOU LIN & LI MING-SHAN, *HISTORICAL MATERIALS FOR THE STUDIES OF CHINA’S COPYRIGHT HISTORY* 133–259 (1999).

⁵³ For a detailed analysis of the Chinese thinking of creativity, see Shao, *Alien to Copyright?*, *supra* note 41, at 412–19.

⁵⁴ After discussing the so-called Confucian concepts of creativity, Montgomery and Fitzgerald wrote “[t]he key issue is: Will China’s historical acceptance of collaborative production...survive in the light of changes to the PRC’s copyright regime prompted by the TRIPs agreement?” Lucy Montgomery & Brian Fitzgerald, *Copyright and the creative industries in China*, 9 *INT’L J. OF CULTURAL STUD.* 407, 409 (2006). This is yet again another common example of how researchers misunderstand China’s history and culture of creativity.

⁵⁵ For the non-monopolistic nature of China’s copyright and knowledge creativity, see Shao, *The Promotion of Learning in Chinese History*, *supra* note 50, at 81–85.

⁵⁶ Shao, *Ingeniousness Excelling Nature*, *supra* note 41.

⁵⁷ HANS EYSENCK, *GENIUS: THE NATURAL HISTORY OF CREATIVITY* 11 (1995) (quoting Robert A. Schumann).

⁵⁸ Some examples of Europe attempting to imitate Chinese porcelain technologies can be found in RENÉ ÉTIEMBLE, *L’EUROPE CHINOISE* 523 (2000).

be addressed in one article. It is widely believed that Mao's prosecution of intellectuals was an immediate cause of the loss. However, in my view, this was not the origin.⁵⁹ Back to the seventeenth century, Chinese innovative capacity was already declining. If we accept Joseph Needham's findings on the level of China's science and technology,⁶⁰ then China's innovative accomplishment was already at its peak before the seventeenth century, making it fairly impossible to further break through without the guide of modern science. This difficulty was further deteriorated under the Manchu Qing ruling, during which the nomadic emperors viewed Han-Chinese-occupied technologies as a threat to their conquest and exercised harsh policies to confine Chinese intellectuals in the self-entertaining closets of archaeology and philology.⁶¹ As a result, under the Qing, creativity and innovation sharply declined.⁶²

Readers of this Article should not mechanically view the above time travel as a nationalistic expression. It is not a fantasy either. Only by understanding the firm roots of respecting creativity and innovation in the Chinese cultural DNA, as supported by so much of Chinese history, can we fully realize that China's innovation dream today is ultimately an effort of *reconnecting* itself to its *disconnected* past.⁶³ This understanding is further confirmed if we accept, as Alford rightly pointed out—with no misleading point to creativity—that “the power of past” is overwhelming in Chinese thinking.⁶⁴ When discussing IP issues in China, our conventional focus on China's post-Opium War xenophobia is inevitably too narrow and, again, disconnected. Xenophobia is not really the focus for the Chinese; bouncing back from the downside is. Although not all Chinese people feel the chemistry of reconnection, it is exactly what is happening, in what we call the painful transition of contemporary China.⁶⁵

Reconnecting China to its high-end tradition is both an “is” and a

⁵⁹ For a discussion, see Shao, *History is a Key Decoder*, *supra* note 2.

⁶⁰ Joseph Needham has written extensively on this matter. Even modern science which appears to have three exclusive Western origins was made possible by a vital component of magnetic phenomena, the foundations of which had all been laid by China. 7-2 JOSEPH NEEDHAM, *SCIENCE AND CIVILISATION IN CHINA: GENERAL CONCLUSIONS AND REFLECTIONS* 24 (Cambridge: Cambridge University Press 2004).

⁶¹ THE MODERNIZATION OF CHINA 196 (Gilbert Rozman ed., 1982).

⁶² MARK ELVIN, *THE PATTERN OF THE CHINESE PAST A SOCIAL AND ECONOMIC INTERPRETATION* 193–94 (1973).

⁶³ This view is expressed publicly in a business article. See Shao, *True China Knowledge*, *supra* note 25, at 16.

⁶⁴ See ALFORD, *supra* note 42, at 19–29.

⁶⁵ The Chinese government calls for the revival of Chinese civilization. It does depict the trend, if we are not too frightened by the political flavors. A very interesting research released in August 2012 even claims that the task of the revival of Chinese civilization has completed 62%. See, e.g., Sun Zifa, *Experts Claims That the Task of the Revival of Chinese Civilization Had Completed 62% by 2010*, CHINA NEWS (Aug. 3, 2012, 11:51 PM), <http://www.chinanews.com/gn/2012/08-03/4082518.shtml>.

“should-be” agenda. In contemporary China’s complex transition, tender memories of China’s civilized, peaceful past, such as the Tang and Song dynasties where humanity, institutions, law, literary creativity, and technologies were highly developed, can act as positive catalyst agents in contemporary Chinese mind—reminding them that there is much to achieve in addition to new money. In contrast, Cassandras, by constantly reminding the Chinese with yellow peril, techno-nationalism, or copycats, might talk down an otherwise fairly healthy situation, especially when our world is full of so many uncertainties at the moment.

III. DON’T FORGET THE INTERNATIONAL CONTEXT

Now let us proceed to another aspect of the holistic perspective—the international context under which the global “development” of the IP system has been unreasonably expanding.⁶⁶ For many renowned Western scholars specializing in IP law, this topic is nothing new, although it might not have been specifically linked to China. But for many others, the notion that the global IP system is unreasonably expanding is either an ignored agenda or hard to accept.

At the top of what I call the “global value chain of knowledge,” there are developed countries which possess various advantages gained during the stages of their industrialization and colonization.⁶⁷ Since the decline of colonization in the second half of the twentieth century, the enclosure of knowledge worldwide has transformed those developed countries’ global dominance into a new area. By the exclusive force of IP protection, production activities and profits can be concentrated among only the big players.⁶⁸ When it comes to international relations and global trade, powerful states control the brain of the world and thus make much higher profits than the cheap-labor suppliers.

The global value chain of knowledge has largely been made possible through IP standard-setting. Powerful companies in Western countries heavily lobby their governments to create internationally “high” standards of IP laws that coincidentally favor their own commercial interest.⁶⁹ The term “high” is correct in the sense that many

⁶⁶ For a succinct discussion, see Ken Shao, *Monopoly or Reward?—The Origin of Copyright and Authorship in England, France and China and a New Criticism of Intellectual Property*, 41 HONG KONG L.J. 731, 733–35 (2011).

⁶⁷ See Shao, *The Global Debates on Intellectual Property: What if China Is Not a Born Pirate?*, *supra* note 29, at 344. For similar views on this, see Gary Gereffi, John Humphrey & Timothy Sturgeon, *The Governance of Global Value Chains*, 12 REV. INT’L POL. ECON. 78, 87 (2005) (mentioning that the value chain’s hierarchy requires those on the top to control resources, especially intellectual property, in order to stay on top).

⁶⁸ Yochai Benkler, *Free as the Air to Common Use: First Amendment Constraints on Enclosure of the Public Domain*, 74 N.Y.U. L. REV. 354, 394 (1999).

⁶⁹ For how the global IP system was mapped by the commercial interest of those companies, see SUSAN K. SELL, *PRIVATE POWER, PUBLIC LAW: THE GLOBALIZATION OF INTELLECTUAL*

standards are tougher than what is needed in developing countries. It is, however, very misleading in the sense that by nature some standards do not function as high-level pro-innovation catalysts, but rather as high-level protectionist shells for multinationals. For instance, some recognized IP standards do not prohibit cheap-quality patents from being approved for government protection, leading one to conclude that these patentability standards are really not all that “high.”⁷⁰

As a result, the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) that governs global IP standard-setting has excreted many uncertainties to developing countries in various sectors, including public health, agriculture, education, and market competition.⁷¹ In sharp contrast, developing countries have never exercised a meaningful sovereignty over global IP standard-setting to suit their development needs.⁷² China, as well as many other developing countries, hobble in this fog.

Another tactic causes more concern, yet only recently was captured. In an unprecedented work, Peter Drahos surveyed forty-five countries to investigate the networked governance of patent offices around the world.⁷³ Drahos’ study revealed that many developed countries’ patent offices have become the private servants to the commercial interest of multinationals, which use patent offices as a shortcut to expand their non-transparent patent portfolios.⁷⁴ Patent searches are a necessary step before granting a patent to an invention, yet performing such searches can be difficult for developing countries, which often lack the resources of developed countries’ patent offices. As a result, many patents are granted in developing countries through developed-country-maneuvered, internationally-networked systems—such as the PCT channel—which functions like automatic transmission belts and do not have effective monitoring mechanisms for minimizing the impact of “high-standard” patents to the domestic development agendas of developing countries.⁷⁵ The above international contexts set a broad framework. And this context needs to be holistically considered when assessing the necessities of China’s self-driven innovation. Here, a few examples give light to the issue and further establish why a holistic approach is needed.

PROPERTY RIGHTS (2003); PETER DRAHOS & JOHN BRAITHWAITE, INFORMATION FEUDALISM: WHO OWNS THE KNOWLEDGE ECONOMY? (2002).

⁷⁰ For a discussion of the cheap-quality patent standards, see DRAHOS, THE GLOBAL GOVERNANCE OF KNOWLEDGE, *supra* note 14.

⁷¹ Peter K. Yu, *Currents and Crosscurrents in the International Intellectual Property Regime*, 38 LOY. L.A. L. REV. 323, 365 (2004).

⁷² Peter Drahos, *Developing Countries and International Intellectual Property Standard-Setting*, 5 J. WORLD INTELL. PROP. 765, 766–67 (2002).

⁷³ DRAHOS, THE GLOBAL GOVERNANCE OF KNOWLEDGE, *supra* note 14.

⁷⁴ *Id.* at 4.

⁷⁵ *Id.* at 334.

Renewable energy receives strong policy support in China.⁷⁶ The growth potential of renewable energy, however, is linked to the global patent system. A short investigation commissioned by the International Centre for Trade and Sustainable Development (ICTSD) in 2007 concluded that with respect to photovoltaics (PV), biofuel, and wind energy, “there seem unlikely to be significant IP barriers to developing nation access.”⁷⁷ This claim might have been a little bit over-optimistic, especially if we do not limit the definition of “access” to licensing and technology purchase. A substantial analysis conducted by the Research and Information System for Developing Countries (RIS) in 2009 warned developing countries of the potential patent barriers, in particular in biofuel and wind energy sectors.⁷⁸ Further, an OECD survey in 2008 showed that Brazil, India, China, and Russia collectively only own about six percent of renewable energy patents, while the EU, the U.S., and Japan own almost eighty percent.⁷⁹

Even though core technologies in the PV industry appear to be available in the public domain,⁸⁰ developing countries generally have little access to the cutting-edge renewable technologies available in developed countries. For developing countries like China and India, domestic innovation capacity-building is more important than simply receiving technology diffusion through cross-border, Darwinist, commercial transactions of technologies. They require more flexibility that is largely unavailable under the TRIPS regime and international political frameworks.⁸¹ An orthodox definition of “access” therefore can be quite meaningless.

China suffers an overproduction problem of solar panels, meaning more panels are produced than can be consumed. But a worse issue is the lack of core technology and patent ownership in the relevant fields.

⁷⁶ For a new study on renewable energy that addresses the energy policies in China and the West, see ZHONGXIANG ZHANG, *ENERGY AND ENVIRONMENTAL POLICY IN CHINA: TOWARDS A LOW-CARBON ECONOMY* (2011).

⁷⁷ John H. Barton, *Intellectual Property and Access to Clean Energy Technologies in Developing Countries: An Analysis of Solar Photovoltaic, Biofuel and Wind Technologies*, ICTSD TRADE & SUSTAINABLE ENERGY SERIES, ISSUE PAPER NO. 2, at 1, 18 (2007).

⁷⁸ K. Ravi Srinivas, *Climate Change, Technology Transfer and Intellectual Property Rights*, RIS DISCUSSION PAPERS, RIS-DP NO. 153, 1 (2009).

⁷⁹ OECD, *COMPENDIUM OF PATENT STATISTICS 21* (2008). A survey in 2007 also confirmed a similar situation. See Zhou Fang, *Patents in Chinese Solar Cells and Solutions*, 5 *ELECS. INTELL. PROP.* 52, 52–56 (2007).

⁸⁰ Arnaud de la Tour, Matthieu Glachant & Yann Ménière, *Innovation and International Technology Transfer: The Case of the Chinese Photovoltaic Industry*, 39 *ENERGY POLICY* 761, 768 (2011).

⁸¹ David G. Ockwell, Ruediger Haum, Alexandra Mallett & Jim Watson, *Intellectual Property Rights and Low Carbon Technology Transfer: Conflicting Discourses of Diffusion and Development*, 20 *GLOBAL ENVTL. CHANGE* 729, 734–36 (2010). This excellent paper distinguishes licensing and transfer from domestic innovation capacity-building and development needs of developing countries. *Id.*

Thus, Chinese solar giants such as Suntech and LDK have to purchase silicon products or production equipment from developed countries at high prices.⁸² Western suppliers sell outdated technologies to China and use that revenue for further R&D in cutting-edge technologies.⁸³ By comparison, China's patent portfolios in solar equipment technologies are quite weak. Further, an impressive number of Chinese patent applications in the field of solar equipment production predominately concentrate on utility model patents. This situation creates two dead ends: as Peng Xiaofeng, the Chairman of LDK said, overproduction deteriorates on the low end whilst core technologies are lacking at the high end.⁸⁴

To put the PV example into a real commercial context, the dead end situation means that although China's PV industry occupies 50% of the world market, it mainly specializes in PV module manufacturing, earning only 8–10% in the global PV value chain.⁸⁵ Patents are becoming the Achilles heel of China's solar industry and many believe that self-driven innovation is the solution under the current challenging global environment.

The Chinese government has recognized the struggles of its industry, and at various international climate summits, China has promoted IP flexibilities—such as the use of patent pools, public sector licensing, compulsory licensing, and patent exclusions. In response, the U.S. industry and trade representatives have insisted on strong IP protection in the field of clean technologies.⁸⁶ The U.S. government has also tried to block the sale of solar patents from U.S. companies to Chinese purchasers.⁸⁷ This situation was followed by multinationals' rigorous patent patrol in China.⁸⁸ The battles are indeed fierce, but they also beg the question of whether patent and licensing should be rigidly enforced in areas that mean so much to climate change and pollution treatment. In a recent study of the matter, Peter Drahos proposed that it is necessary to deal with this urgent issue at the highest level of cooperation and via a variety of governance tools that move beyond the

⁸² Lu Xiaohui, *The Lack of Core Technologies in China's PV Industry and its Challenges*, CHINA HIGH-TECH INDUS. HERALD, May 10, 2010.

⁸³ *Id.*

⁸⁴ Xiao Xiao, *PV Industry: Increasing Innovation to Change the Future*, SIPO NEWS, June 1, 2012.

⁸⁵ Liu Chengkun, *The China-Europe Hidden War in PV Industries*, TIME WEEKLY, Aug. 9, 2012.

⁸⁶ Matthew Rimmer, *Who Owns the Sun? Patent Law and Clean Energy*, THE CONVERSATION (Feb. 21, 2012, 2:50 PM), <http://theconversation.edu.au/who-owns-the-sun-patent-law-and-clean-energy-5193>.

⁸⁷ *Id.*

⁸⁸ See, e.g., Ellen Pressley, *DuPont Addresses Patent Protection at Solarbuzz China: Intellectual Property Theft Growing in Competitive Climate of Photovoltaics*, DUPONT NEWS & EVENTS (July 19, 2012), http://www2.dupont.com/Photovoltaics/en_US/news_events/article20120719.html.

“ghost” of ideological debates over IP.⁸⁹ China has already initiated Drahos’s proposal—by developing self-driven innovation policies that will be discussed in Part IV of this paper.

IP is not the only marsh for Chinese high-tech firms. There are many other connected ones in the WTO’s trading territory. The Chinese PV industry has recently attracted protectionist actions amid the economic downturn in the U.S. and Europe. From November 2011 to May 2012, the U.S. government announced several actions against a number of large Chinese solar firms under the WTO mechanisms of antidumping, subsidies, and countervailing.⁹⁰ This has now been spread to Germany.⁹¹

The solar industry is only one example of the challenge of the global IP regime, and there are many more. Innovation in China’s state-supported automobile industry, for instance, is substantially outweighed by purchase of foreign models and technologies.⁹² Foreign investment and limited technology spillover have not helped the Chinese manufacturers to undertake desired R&D activities. In the new-energy car sector—a field where all countries once stood at the same relative starting point in the race—the lack of core technologies and strong patent portfolios are dramatically affecting China’s R&D and industrial capacities and ability to become an innovative leader in this new market.⁹³ This situation has eased the U.S. concerns over Chinese competition, as American companies “appear to have continued to expand production of vehicles in China.”⁹⁴

The international context set forth thus far facilitates a holistic understanding of a purpose for China’s self-driven innovation initiative, namely, to gain more development flexibilities. China has received much criticism for its attempts to set native technical standards to achieve its goal, but China is neither the first nor the last country to seek use of technical standards to enhance competitiveness.⁹⁵ In an

⁸⁹ Peter Drahos, *The China-US Relationship on Climate Change, Intellectual Property and CCS: Requiem for a Species?*, 2009 WIPO J. 125, 126.

⁹⁰ For details, view the press releases published on the U.S. Department of Commerce website, *News Room*, U.S. DEP’T OF COM., www.commerce.gov/news (last visited Apr. 1, 2013); e.g., Int’l Trade Admin., U.S. Dep’t of Commerce, *Fact Sheet, Commerce Preliminarily Finds Dumping of Crystalline Silicon Photovoltaic Cells, Whether or Not Assembled into Modules from the People’s Republic of China* (May 17, 2012), available at <http://ia.ita.doc.gov/download/factsheets/factsheet-prc-solar-cells-ad-prelim-20120517.pdf>.

⁹¹ Chengkun, *supra* note 85.

⁹² G. E. ANDERSON, *DESIGNATED DRIVERS: HOW CHINA PLANS TO DOMINATE THE GLOBAL AUTO INDUSTRY* 39 (2012).

⁹³ Liu Siyang, *Three Development Models of China’s New-Energy Automobiles*, SERI CHINA, July 20, 2012.

⁹⁴ ITC 2011 REPORT, *supra* note 11, at 5-5–5-33.

⁹⁵ Richard P. Suttmeier and Yao Xiangkui, *China’s Post-WTO Technology Policy: Standards, Software, and the Changing Nature of Techno-Nationalism*, 7 NAT’L BUREAU ASIAN RES., SPECIAL REP. 7, 45 (2004).

international environment where IP barriers are strong, establishing new technical standards might be a dark horse for Chinese companies to smash through those barriers. China's automobile industry is often criticized by foreign commentators for "copy design" and patent infringement.⁹⁶ But a relaxed IP law system is a valuable way to enable accumulation of knowledge. In fact, this now-criticized approach was used by all major countries at their own developing stages in the past.⁹⁷ Yet, today, similar flexibilities are not available to developing countries under the highly harmonized international IP regime and WTO system.⁹⁸ This change might arguably explain the context for some of China's "avant-garde" solutions to self-driven innovation, such as government procurement and preferential lending.

It is noteworthy that China's self-driven innovation is not monolithic or insensitive to non-Chinese interests.⁹⁹ According to the U.S. government, this shift in China's policy focus only occurred in 2010–11.¹⁰⁰ However, China's leaders went to great lengths to remind the international community that self-driven innovation policies are not designed to insulate China from international cooperation.¹⁰¹ For example, multinational pharmaceutical companies have already been one of the beneficiaries of China's innovation policy incentives. Under China's \$960 million "New Drug Creation and Development Program (2008)," recipients included domestic drug R&D institutions, as well as dozens of giant multinationals such as Pfizer, Johnson & Johnson, and Roche.¹⁰² Evidence shows that these multinationals are innovating in China and may share patent ownership with Chinese developers.¹⁰³

⁹⁶ ANDERSON, *supra* note 92, at 39.

⁹⁷ For instance, to understand the relaxed experiences of the U.S., Germany, and the Netherlands, see MEREDITH L. MCGILL, *AMERICAN LITERATURE AND THE CULTURE OF REPRINTING* (2003) (providing a case study of the American publishing industry in the 1830s and 1840s, which heavily engaged in reprinting of foreign books, and arguing that the sale of cheap reprints of foreign books during this era is what established the mass-market demand for literature in America); ECKHARD HÖFFNER, *GESCHICHTE UND WESEN DES URHEBERRECHTS [HISTORY AND NATURE OF COPYRIGHT]* (2010) (discussing the German experience); G. Doorman, *Patent Law in the Netherlands—Suspended in 1869 and Reestablished in 1910*, 30 J. PAT. OFF. SOC'Y 225 (1948) (discussing the patent system in the Netherlands in the nineteenth century and the history of its temporary abolition).

⁹⁸ For an examination of the potential inconsistencies between China's innovation policies and its WTO obligations, see Siyuan An & Brian Peck, *China's Indigenous Innovation Policy in the Context of its WTO Obligations and Commitments*, 42 GEO. J. INT'L L. 375 (2011).

⁹⁹ Richard P. Suttmeier, *A New Technonationalism?: China and the Development of Technical Standards*, 48 COMM'NS. OF THE ACM 35, 37 (2005).

¹⁰⁰ ITC 2011 REPORT, *supra* note 11, at 5–5–5–6.

¹⁰¹ Cong Cao, Richard P. Suttmeier & Denis Fred Simon, *China's 15-Year Science and Technology Plan*, PHYSICS TODAY, Dec. 2006, at 38, 43.

¹⁰² Bethan Hughes, *China Spurs Pharma Innovation*, 9 NATURE REVS. 581, 581 (2010).

¹⁰³ *Id.* at 581–82.

IV. LET'S FACE THE DEVELOPMENT CONTEXT

The third holistic perspective is the development context. Self-driven innovation that reconnects China to its high-end cultural DNA and responds to the global value chain of knowledge ultimately serves China's development needs and attends to China's *specific* conditions in both global and local contexts. It is a guiding principle of the international community that every country deserves opportunities of development. "Development for All" is a United Nation agenda that includes an emphasis on higher standards of living and social progress for all nations.¹⁰⁴

In the absence of any specific WTO/TRIPS clauses that facilitate development-friendly IP policies in developing countries, a self-determined "Development Impact Assessment" (DIA) framework, as Graham Dutfield has proposed, is essential to the development needs of developing countries.¹⁰⁵ China's pro-self-innovation efforts can be viewed as a good example of a DIA framework, which includes multi-layered, interconnected, and flexible policies, incentives, and strategies. This system, initially defined as the national innovation system (NIS) by Christopher Freeman,¹⁰⁶ has been developed through different stages in tune with different economic changes in post-Cultural Revolution China.¹⁰⁷

China's most relevant and comprehensive NIS policies include, for instance, the National Medium and Long-Term Guideline for Science and Technology Development Plan 2006-2020 (the S&T Guideline), the National Guideline of Intellectual Property Strategy 2008 (the IP Strategy), the National Medium and Long-term Guideline of Talent Development Plan 2010-2020 (the Talent Plan), the Cultural Reform and Development Outlines in the 12th Five-Year Plan Period 2012 (the Cultural Renaissance Plan), and the Energy-saving and New-energy Automobiles Development Plan 2012-2020 (The New-energy Automobiles Plan).¹⁰⁸ These forward-looking national-level strategies sufficiently reflect state sovereignty and autonomy in designing domestic development frameworks.

These multi-layered, interconnected, and flexible NIS policy frameworks may help China to address its numerous challenges that are

¹⁰⁴ UNITED NATIONS DEP'T OF ECON. & SOC. AFFAIRS, THE UNITED NATIONS DEVELOPMENT AGENDA: DEVELOPMENT FOR ALL (2007), available at http://www.un.org/esa/devagenda/UNDA_BW5_Final.pdf.

¹⁰⁵ Graham Dutfield, *Making TRIPS Work for Developing Countries*, in DEVELOPING COUNTRIES AND THE WTO: POLICY APPROACHES, 141, 163-65 (Gary P. Sampson & W. Bradnee Chambers eds., 2008).

¹⁰⁶ CHRISTOPHER FREEMAN, TECHNOLOGY POLICY AND ECONOMIC PERFORMANCE (1987).

¹⁰⁷ For a discussion of many of these policies, see Shao, *Patent Law, National Strategies and Policy Incentives*, *supra* note 2, at 86-87.

¹⁰⁸ *Id.* at 94-99.

the results of internal and external factors. These factors include a labor-intensive economy, severe pollution, wealth gap, institutional dysfunctions, low knowledge and skill levels, and weak technological and cultural strengths in the global context, to name a few—all of which require immediate attention. Innovation is a vital solution to these problems, but within this solution there are financial, structural, and human resource challenges to be further addressed.¹⁰⁹

Human resource represents a key solution to innovation. But human resource is a fundamental problem for China. In my view, the *biggest* challenge for China's overall transition is the quality of Chinese human resource, which limits the capacity of China's political, legal, economic, and educational reforms. This can be confirmed from a conclusion of the 2012 China Business Climate Survey Report of U.S. AmCham China:

finding qualified talent—both at the managerial level and below—is a major concern . . . This year AmCham China members ranked management-level human resources constraints as their top business challenge.¹¹⁰

Many view institutions as the fundamental obstacle to China's development of a knowledge-based economy, a civilized society, social order, and rule of law and thus cannot wait for the changes. This focus on institutions ignores the crucial fact that China's human resource foundation was ruined in the Cultural Revolution and cannot now support high-level institutional changes. When Deng Xiaoping reopened China's door in 1978, China was at the edge of collapse with an exploded *and* uneducated population. The only choice for China in the well-established global value chain at the time was to supply cheap labor from its uneducated and unskilled population.¹¹¹

But cheap labor was not the end for Deng who firmly believed that "science and technology are the primary productive force."¹¹² Yet, human resource problems are omnipresent in China and the innovation

¹⁰⁹ In an economic work, these issues were addressed. See CARL J. DAHLMAN & JEAN-ERIC AUBERT, *CHINA AND THE KNOWLEDGE ECONOMY: SEIZING THE 21ST CENTURY* (2001).

¹¹⁰ The survey shows a 43% dissatisfaction rate of management-level human resource constraints. See THE AM. CHAMBER OF COMMERCE IN THE PEOPLE'S REPUBLIC OF CHINA, *CHINA BUSINESS CLIMATE SURVEY 11* (2012), available at <http://web.resource.amchamchina.org/cmsfile/2012/03/26/c46fc22667c5eeb231748808a9244027.pdf>. This was rated at 30% in 2011. See THE AM. CHAMBER OF COMMERCE IN THE PEOPLE'S REPUBLIC OF CHINA, *CHINA BUSINESS CLIMATE SURVEY 11* (2011), available at <http://www.amchamchina.org/upload/cmsfile/2011/03/22/efb2ab9d3806269fc343f640cb33baf9.pdf>.

¹¹¹ Shao, *Patent Law, National Strategies and Policy Incentives*, *supra* note 2, at 86–87.

¹¹² Deng Xiaoping, 3 *SELECTED WORKS OF DENG XIAOPING* 274 (1993); Philip Shenon, *Chinese Accused of Pirating Disks*, N.Y. TIMES, Aug. 18, 1994, at D1 (noting that this Deng Xiaoping quote appeared on a billboard in China).

sectors are certainly inescapable. In some areas, such as the PV industry, policy implementations are designed by inexperienced policy-makers and often lack clear definitions, consistency, and accessibility.¹¹³ Chinese investors, often unskilled in the many areas in which they invest, rush into the solar market and focus on the initial stages of investment, but struggle with quality and cost management.¹¹⁴ In the new-energy car sector, policy uncertainties separated business resources and resulted in the launch of the New-energy Automobiles Plan that specifically focuses on alternative fuels and hybrid batteries.¹¹⁵

In response to the human resource problems, for over thirty years, through research funding and open-door policies, China has been supporting and encouraging native Chinese to study overseas. Together with the human resources accumulated internally, this has created a vast talent pool for China. Central and local governments, as well as different innovation parks, companies, and institutions now have numerous dynamic talent programs to attract Chinese talents to contribute to China's innovation economy.¹¹⁶

In today's China, policy adjustments are not simply state-controlled.¹¹⁷ Elites are increasingly involved in China's decision-making processes, such as through direct politic engagement, public hearings, research studies, and fieldworks.¹¹⁸ Here innovation parks, industrial parks, and economic zones may play a constructive role: scientists, managers, and researchers are clustered there, providing first-hand experience to policy changes.¹¹⁹ Boosting the energy of Chinese talents is a fundamental solution to China's development needs in all sectors.

But attracting overseas Chinese human resources requires flexible policies, such as preferential lending and subsidies. In China, obtaining

¹¹³ Yu Hongbo, *Shi Zhengrong: The PV Industry as Part of China's Energy Strategy*, PV News, July 24, 2012.

¹¹⁴ *Id.*

¹¹⁵ Liu, *supra* note 93.

¹¹⁶ Shao, *Patent Law, National Strategies and Policy Incentives*, *supra* note 2, at 96–97.

¹¹⁷ For a perhaps slightly overstrained analysis of the governmental role in China's innovation, see Feng-chao Liu, Denis Fred Simon, Yu-tao Sun & Cong Cao, *China's Innovation Policies: Evolution, Institutional Structure, and Trajectory*, 40 RES. POLICY 917 (2011). Economic studies show that private firms lead innovation in China. For an excellent economic study, see Xielin Liu & Peng Cheng, *Is China's Indigenous Innovation Strategy Compatible with Globalization?*, 61 EAST-WEST CENTER POLICY STUDIES 33–37 (2011), available at <http://www.eastwestcenter.org/sites/default/files/private/ps061.pdf>.

¹¹⁸ For a description of part of this system, see Cong Cao, *Towards a Better Understanding of China's Scientific Elite*, in GREATER CHINA'S QUEST FOR INNOVATION 217, 223–25 (Henry S. Rowen, Marguerite Gong Hancock & William F. Miller eds., 2008).

¹¹⁹ In 2010, I analyzed the innovation capacity and policy implementation functions of these industrial districts in China. See Shao, *Patent Law, National Strategies and Policy Incentives*, *supra* note 2, at 99–102. This has since been substantially studied by Michael Keane. See KEANE, CHINA'S NEW CREATIVE CLUSTERS, *supra* note 9.

a bank loan is extremely difficult for small and medium enterprises (SMEs), which suffer huge problems of cash flow. As a 2011 survey conducted by China's Ministry of Industry and Information Technology shows, only 15% of Chinese light industrial SMEs accessed bank loan in 2011.¹²⁰ Under China's current conditions, establishing a credit system for SMEs can be a challenge. Venture capital may be an alternative solution, as has been common and successful in some leading innovation economies such as the U.S. and Israel.¹²¹ A typical example is that a local government in an innovation park may set up such a venture capital fund, which is then managed by a government agency or a private company. Private fund and university and foreign investment also play certain roles.¹²² However, inexperienced human resource is again the biggest problem: the lack of qualified fund managers, for instance, has been identified by various studies as a bottleneck in China's venture capital sector.¹²³

In this context, preferential lending might be an effective solution for high-tech companies and forms a crucial part of the talent programs for attracting overseas Chinese returnees. These returnees that studied abroad would otherwise not return home if cash flow within China is a big problem for commercializing their high-tech dreams, which often start from small seeds of investment. The same applies to public procurement, which, as OECD researches show, is increasingly becoming a powerful instrument to drive innovation in many countries due to its potential of reducing market risk. South Korea is a good and successful example.¹²⁴ Given China's current *status quo*, public procurement can be an effective way to support firms, such as those established by Chinese returnees.

The implementations of China's IP strategies also reflect the needs of self-determined policy framework. In 2010, Tian Lipu, Director of the State Intellectual Property Office, published an article for the second anniversary of the establishment of the IP Strategy.¹²⁵ Tian began his article by discussing the fundamental importance of using the IP

¹²⁰ Liu Shiping, *Solving the Loan Difficulties for SMEs: How Long Will We Wait?*, XINHUA NEWS, Apr. 23, 2012.

¹²¹ For an explanation of the Israeli system copied in China, see CHUNLIN ZHANG, DOUGLAS ZHIHUA ZENG, WILLIAM PETER MAKO & JAMES SEWARD, PROMOTING ENTERPRISE-LED INNOVATION IN CHINA 92 (2009), available at http://siteresources.worldbank.org/CHINAEXTN/Resources/318949-1242182077395/peic_full_report.pdf.

¹²² JOHN L. ORCUTT & HONG SHEN, SHAPING CHINA'S INNOVATION FUTURE: UNIVERSITY TECHNOLOGY TRANSFER IN TRANSITION 197 (2010).

¹²³ ZHANG, *supra* note 121, at 201-03.

¹²⁴ OECD, REVIEWS OF INNOVATION POLICY: KOREA 244 (2009), available at <http://dx.doi.org/10.1787/9789264067233-en>.

¹²⁵ Tian Lipu, *Providing Effective Support to Fastening the Change of Economic Development Model*, STATE INTELL. PROP. OFFICE OF CHINA (June 4, 2010, 5:56 PM), www.nipso.cn/oneews.asp?id=9544.

Strategy to boost the internal momentum and core competitiveness for China's development.¹²⁶ He also explicitly criticized China's labor intensive model for its low innovative capacity and damage to the environment.¹²⁷ It is essential, as being proposed by many Western IP scholars, that developing countries have their own IP strategies suitable for domestic development.

China is increasingly becoming strategic on patent matters. It has established strict patentability criteria and universal prior art pools in specific technological areas such as agriculture. These models are inspired by German and EU laws, which interpret patentability more strictly than the U.S.¹²⁸ China is not alone. Brazil has a quite powerful monitoring system on pharmaceutical patents. Singapore, which is a small player in the global patent system, has amended its Patent Act in 2012 to include a better domestic capacity-building mechanism for reducing reliance on foreign patent examinations.¹²⁹ Flexibilities and autonomy need to be enjoyed by China's IP strategies for satisfying domestic agendas; they need to be de-ideologized.

The last example to be contextualized in this Article is China's emerging cultural creative industries (*wenhua chuangyi chanye*). This topic had traditionally "escaped mainstream academic attention" in the West.¹³⁰ When discussing China's cultural industries, censorship might be the first keyword that comes into many commentators' minds. This, however, should not be taken to deny the progress and necessity of China's cultural industry. A UNCTAD's report shows that creative goods exports have enabled China to gain the highest trade surplus, which increased from \$29 billion in 2002 to \$79 billion in 2008.¹³¹ This shows some progress, but creative designing capacity in China is still overall weak. Although China has produced an increasing amount of top-end cultural products, such as movies, exports of Chinese cultural goods are largely limited to low-end handicrafts for low-end foreign markets.

To address this issue, China recently announced its Cultural

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ DRAHOS, THE GLOBAL GOVERNANCE OF KNOWLEDGE, *supra* note 14, at 232.

¹²⁹ Duan Ran, *Singapore Plans to Reform Patent Law to Improve Examination Capacity*, STATE INTELL. PROP. OFFICE OF CHINA (June 15, 2012), http://www.sipo.gov.cn/dttx/gw/2012/201206/t20120615_709500.html.

¹³⁰ Michael Keane, *Great Adaptations: China's Creative Clusters and the New Social Contract*, 23 CONTINUUM: J. OF MEDIA & CULTURAL STUD. 229 (2009). But since 2011, a few excellent monographs have been produced in English, focusing on issues such as creative capacity, industrial scales, and intellectual property issues. For three excellent books, *see* PANG, *supra* note 5; KEANE, CHINA'S NEW CREATIVE CLUSTERS, *supra* note 9; LI WUWEI, HOW CREATIVITY IS CHANGING CHINA (Michael Keane ed., 2011).

¹³¹ UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT, CREATIVE ECONOMY REPORT 2010, 133–34 (2010), *available at* http://unctad.org/es/Docs/ditctab20103_en.pdf.

Renaissance Plan,¹³² which has a purpose of increasing China's "soft power of culture."¹³³ This jargon does not have to scare international communities. Whilst copyright piracy in the short term affects foreign revenues, it also stimulates creative ideas and maximizes affordable access to cultural products by low- and middle-income populations within Mainland China. An interesting consequence is that piracy helps the prevalence of foreign culture, if not foreign copyright, in the nation. Cultural products are about styles, tastes, and perceptions. For this reason, piracy acts as an affordable, powerful agent to, as Laikwan Pang has accurately discovered, develop a "reception structure" in which domestic consumers admire foreign culture.¹³⁴ Yet this consumption of foreign culture can also lead to the decline of domestic creativity and cultural identities. Thus effective cultural policies, such as China's Cultural Renaissance Plan, are crucial to all nations to preserve domestic culture.

Boosting cultural and creative industries has great meaning for China. Arguably, China's fundamental development need in education, a civilized society, and rule of law essentially require a Chinese Cultural Renaissance which, as the first section of this Article articulates, *reconnects* Chinese people to their high-end cultural DNA and past and thus inspires a peaceful and constructive transitional period. The splendid success of the Western civilization was grounded in the European Renaissance. In China, this cultural renaissance process has been interrupted by internal and external facts in China's modern history.¹³⁵ Boosting cultural and creative industries can dramatically change this unfortunate part of Chinese history and lift China's cultural strengths and images from the *extremely* low-end to its *deserved* high-end. As we have discussed previously, misunderstandings of China are ultimately caused not by foreign nescience, racism, or Eurocentrism, but by the abundance of low-end and distorted Chinese culture that flows in China and abroad. The best way to remedy the misconceptions and to ensure desirable development outcomes for both China and the world is by promoting, embracing, and exporting high-end Chinese culture and thus increasing the so-called soft power of culture.

CONCLUSION

Due to the complexities of internal and external causes, a holistic

¹³² *State Council Issued its National "12th Five-year Plan on Cultural Reform and Development"*, CHINA NEWS (Feb. 15, 2012, 6:29 PM), http://www.gov.cn/jrzq/2012-02/15/content_2067781.htm.

¹³³ *Id.*

¹³⁴ PANG, *supra* note 5, at 172. Pang also analyzed the extreme popularity of the Japanese Miyazaki collection in China. *Id.* at 161–83.

¹³⁵ *See supra* notes 31–36, 57–61 and accompanying text.

perspective of China is, in general, lacking. Self-driven innovation in China provides an ideal example of how a non-holistic perspective distorts the nature of historical events and policies in China. Foreign concerns over China's self-driven innovation policies and incentives should be re-assessed by considering the holistic perspectives proposed in this Article. To make such a shift work, de-ideologization should to be the first step, followed by the willingness to accept new facts.

China's self-driven innovation policy initiative is a response to internal and external challenges faced by the nation's own development needs. The imbalanced international order pushes China to opt for self-determined, flexible innovation approaches, which are not available within the rigid and development-unfriendly WTO/TRIPS regime. Internal challenges such as a labor-intensive model, severe pollution, wealth gaps, and serious human resource problems all require China to have flexible development opportunities in innovation and further economic transition. Notably, flexible development opportunities were available to the now-industrialized nations during their earlier stages of development and helped them to become established as developed countries.

Innovation can and should be a key bridge to a peaceful and successful transition in modern China. A proper examination of Chinese history reveals the fact that innovation is in the Chinese cultural DNA and China used to be a global innovation leader in pre-industrial eras. *Reconnecting* China to its high-end tradition and past is fundamentally beneficial to its progress in the future. Tender memories of China's civilized, peaceful past, such as the Tang and Song dynasties, where humanity, institutions, law, literary creativity, and technologies were highly developed, can act as positive catalyst agents in the Chinese mind—reminding them that there is much to achieve in addition to new money.

There is "little that the international community can do to change" China's innovation pace.¹³⁶ U.S. government policy advisers have already realized that China and the U.S. should promote innovation jointly;¹³⁷ they increasingly believe that the two nations "share an interest in seeing China emerge as a prosperous technological innovator."¹³⁸ Collaboration benefits all. The worst strategy is one that talks down China's innovation, misdirecting the Chinese to embrace a

¹³⁶ Statement of Richard P. Suttmeier, *supra* note 13, at 41.

¹³⁷ CHARLES W. WESSNER, NAT'L RES. COUNCIL OF THE NAT'L ACADS., *BUILDING THE 21ST CENTURY: U.S.-CHINA COOPERATION ON SCIENCE, TECHNOLOGY, AND INNOVATION* 4-5 (2011).

¹³⁸ *China's Indigenous Innovation Trade and Investment Policies: How Great a Threat?: Hearing Before the Subcomm. on Terrorism, Nonproliferation, and Trade of the H. Comm. On Foreign Affairs*, 112th Cong. 53 (2011) (statement of Philip I. Levy, Resident Scholar, The Am. Enter. Inst. for Pub. Policy Res.).

narrow and dangerous version of nationalism.

When we look back, China's unfortunate fate in the last few centuries is merely an episode within a different and much larger story. A student who wants to recover from his devastating downside inevitably brings up pain, instability, and emotions. But his peers do not need to be too nervous. Teamwork is an eternal spirit for a classroom, and so it is—and can be—for the world.