Discord or "Harmonious Society"?

China in 2030

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About the Authors

Col John P. Geis II, PhD, entered the Air Force in 1983 and has served as an instructor, weapons systems officer, navigator, and fire control officer on aircraft such as the F-111A, F-111E, T-37, AT-38B, T-43, and AC-130H. Operationally, he served as a planner for Operation Eldorado Canyon, flew combat missions over Bosnia-Herzegovina, and commanded a special operations task force in Korea. In 1996 Colonel Geis coauthored the alternate futures monograph for the chief of staff–directed *Air Force 2025* study. Shortly thereafter, he served as chief, Strategic Planning, Doctrine, and Force Integration Branch at Headquarters Air Force Special Operations Command, leading all long-range planning, doctrine development, and joint force integration for all Air Force Special Forces. Colonel Geis graduated from the Air War College (AWC) in 2001 and served as the director of the USAF Center for Strategy and Technology (CSAT) until 2004. After earning his doctorate degree from the University of Wisconsin, Colonel Geis returned to CSAT in 2007 and is again its director. He has a bachelor of science degree in meteorology from the University of Wisconsin, a master of political science degree from Auburn University, a master of strategic studies degree from AWC, and both a master of arts and a doctor of philosophy degree in political science from the University of Wisconsin.

Lt Col Scott E. Caine earned his Air Force commission in 1987 through Officer Training School. He subsequently attended the Aircraft Maintenance Officer's course, where he graduated with honors, before being assigned as an E-3B maintenance officer. Colonel Caine earned his pilot wings and served as a T-37 instructor pilot, an A/OA-10 pilot and forward air controller, and a battalion air liaison officer. He flew combat missions over Bosnia-Herzegovina and Iraq in Operations Deny Flight, Decisive Endeavor, and Southern Watch. Colonel Caine then served on the Air Combat Command staff as chief, A/OA-10 Operational Training, and as executive officer to the director of aerospace operations. After attending the US Army Command and General Staff College and the School of Advanced Air and Space Studies (SAASS), Colonel Caine served as chief of safety for the 23rd Fighter Group and as operations officer and later as commander of the 25th Fighter Squadron. Colonel Caine is a command pilot with more than 3,000 hours in the A/OA-10, T-37, T-38, and AT-38 aircraft. He holds a bachelor of electrical engineering degree from Georgia Institute of Technology, a master of science degree from Troy University, and a master of airpower art and science degree from SAASS.

Col Edwin F. Donaldson received his commission in 1986 through the Reserve Officer Training Corps (ROTC) at Bloomsburg State University, Pennsylvania. As a junior officer, he served as an

information systems officer, protocol officer, and aide-de-camp to the Air Logistics Center's commanding general at Robins AFB, Georgia. In 1989 Colonel Donaldson attended Undergraduate Navigator Training and was selected to fly in the B-52. He later served as a standardization and evaluation flight examiner and flight commander. In 1999 Colonel Donaldson was assigned to US Strategic Command, Offutt AFB, Nebraska. During this joint assignment, he served on board the *Looking Glass* as an airborne director of operations/single integrated operational plan advisor. In 2002 Colonel Donaldson returned to the B-52 community and was assigned to Barksdale AFB, Louisiana. There he served as the director of operations, 96th Bomb Squadron, and oversaw preparation for Operations Enduring Freedom and Iraqi Freedom. In 2003 Colonel Donaldson took command of the 20th Bomb Squadron at Barksdale. While there he led the squadron deployment to the Pacific area of responsibility, where he successfully executed Operation Resultant Fury, a concept demonstration holding moving maritime targets at risk. In 2005 Colonel Donaldson was assigned to the HQ USAF Global Strike Concept of Operations Division. As the deputy director, he executed the Air Force–level capabilities review and risk assessment, advising the Air Force chief of staff and the Air Force Strategic Plans and Programs Office on future Air Force capability requirements. A recent graduate of AWC, Colonel Donaldson is now assigned to the National Geospatial-Intelligence Agency in St. Louis, Missouri.

Col Blaine D. Holt was commissioned through and designated a distinguished graduate of the University of Georgia's Air Force ROTC in 1988. He served as operations officer, 17th Airlift Squadron, and chief, joint requirements, Directorate of Operations, United States European Command. Prior to his current assignment, he commanded the 16th Airlift Squadron and the 817th Expeditionary Airlift Squadron. Colonel Holt is a command pilot with more than 3,700 flying hours in a variety of aircraft. He was selected to the C-17A initial cadre, completing the tour as a C-17A lead airdrop examiner pilot. He is certified as a military linguist and maintains fluency in Dutch. His dissertation, written and defended in Dutch, was awarded a "with distinction" honor at the Royal Superior College of Defense in Brussels. In 2006 he partnered with a fellow C-17A squadron commander to develop, write, and successfully staff a revolutionary new strategy in the combat employment of C-17A forces. Colonel Holt has a bachelor's degree from the University of Georgia and a master of arts degree from George Washington University.

Lt Col Ralph A. Sandfry, PhD, is a 1989 graduate of the University of Kansas, where he was commissioned via the Air Force ROTC program. He served in various acquisitions, engineering, and test assignments, including the global positioning system and maverick missile program offices. Colonel Sandfry was selected by

the US Air Force Academy to be an instructor of astronautics and executive officer for the Department of Astronautics, where he taught astrodynamics, rocket propulsion, and engineering design. The Academy sponsored Colonel Sandfry to pursue a doctorate degree in engineering, which he completed in 2001. He then served as test director and later as director of operations for Detachment 4, Air Force Operational Test and Evaluation Center, where he led daily operations of Air Force and multiservice operational testing of space systems. He then returned to the Department of Astronautics as systems division chief and associate professor where, in addition to teaching astronautical engineering courses, he annually led a cadet team to design, build, test, and fly a Mach 3+ sounding rocket. A level III space professional, Colonel Sandfry is also a distinguished graduate of Squadron Officer School and the Air Force Institute of Technology (AFIT). He earned a bachelor of science degree in aerospace engineering from the University of Kansas, a master of science degree in systems engineering from AFIT, and a doctorate degree in aerospace engineering from Virginia Tech, where his research on spacecraft attitude dynamics was selected as the university's outstanding dissertation in 2001.

Abstract

For more than 5,000 of the 6,000 years of recorded history, China has been the preeminent nation of our planet. While the past two centuries have seen the dominance of the West over the "Middle Kingdom," present trends suggest that this dominance is coming to an end. With its ancient cultural roots intact, the government of China, regarded by many of its people as having a "mandate of heaven," is leading China into the future at almost blinding speed. Within the time frame covered in this monograph, China will supplant the United States as the greatest economic power on Earth. While its military capabilities are expected to lag slightly behind, by 2030 China will be, for all practical purposes, a peer of the United States in terms of its ability to influence interactions within the nation-state system.

The Chinese predilection for indirect methods of handling conflict suggests that, should conflict between the two nations occur, the United States may be faced with challenges for which it is not well prepared. Further, the usual Department of Defense (DOD) myopic focus on the present may be blinding decision makers to the challenges of tomorrow.

That China will be an adversary is not a foregone conclusion. Neither is its friendship. While this study concludes that it is China's intent to seek mutually beneficial relations with the West, internal forces have the potential to drive China toward conflict. Should this occur, the most likely outcome would be a proxy war, where US and Chinese interests could clash.

What is certain is that whatever the actions of China in 2030, the United States must be prepared to handle the challenges these actions present. Handling these challenges will require investments in new systems and technologies, especially in the fields of responsive space, offensive and defense cyberspace, more responsive strategic lift, and survivable tactical lift and long-range strike. Of equal concern will be resolving the internal national debate on which department is really responsible for defending against attacks that produce effects on the territory of the United States itself. This is critical because as with improved offensive cyber-attack capabilities, in a war with a peer China, the homeland military and critical civilian infrastructure will not be immune from a conflict's effects.

Preface and Acknowledgments

In 1996 the Air Force initiated a major study under the direction of the Air Force chief of staff, Gen Ronald Fogleman. That study looked 30 years into the future and brought together some of the brightest minds and most forward thinkers of the age, including Dr. Norman Augustine, president of Lockheed Martin; Alvin Toffler; James Cameron, who later directed the movie *Titanic*; Burt Rutan; Gen Bernard Schriever; Adm Bobby Inman; and Drs. Gene McCall and Dan Hastings, two chairmen of the Air Force Scientific Advisory Board. That study, *Air Force 2025*, made enormous contributions toward directing Air Force research and procurement to ready our forces for new challenges.

In 2007 Gen T. Michael Moseley, Air Force chief of staff, directed that a continuous series of future thinking and study efforts be undertaken, using Air University (AU) as the "Air Force's think tank." This monograph is part of that ongoing effort. The authors collectively spent a year researching and traveling to ascertain what range of challenges China may present over the next 20 to 30 years, with a target date of 2030. The team spent significant effort on researching Chinese culture, its political system, its rapidly growing economy, and its recent military buildup. These efforts form much of this monograph.

From this basic research and meetings with Chinese experts both in the United States and in China, the team began to explore the various directions China might take in the future. This exploration is not a forecast of a specific future, but rather is designed to help the reader better understand the magnitude and shape of a rapidly rising Asian power. This power may be our friend or foe. Whatever it does become, the nation must be ready to engage it as a fellow member of the international system.

All the authors owe debts of gratitude to many who offered advice. While too numerous to list here, they are listed in the documentation and endnotes. We owe an even greater debt to our families, who endured lengthy separations as the team traveled to research this monograph. To them we owe more than can be stated here.

Chapter 1

Introduction

Col John P. Geis II, PhD

The last 100 years have been called the American century.[1] This monograph is about the start of what may be the Asian millennium.[2] The ancient Middle Kingdom is again on the rise, and China's destiny, like its past, seems to be one of preeminence. Every indication suggests that, at some time in the next 30 to 50 years, China will be the single strongest state, both economically and militarily, on the face of the earth. While some authors quibble about dates, there are few who argue about the eventual outcome.

This monograph is part of the *Blue Horizons* study commissioned by Gen T. Michael Moseley, former US Air Force chief of staff, to provide "a new look at the future." Specifically, the chief of staff asked Air University (AU) to "provide a common understanding of future strategic and technological trends for Air Force leaders to make better decisions." The chief also sought to "confirm Air University as our [the Air Force's] in-house think tank" and to improve the relevance of Air Force education to the decision-making processes in Washington.[3]

Within the context of this 2008 study, four separate planning scenarios were examined. The best and brightest officers from the Air Force and its sister services were specially selected to participate during their one-year courses of instruction at AU. These scenarios include a resurgent Russia, a failed state in Nigeria, a successful al-Qaeda overthrow of a friendly Middle Eastern state, and China's rise to peer status.

Within the monographs produced from these studies, there is no magic, no fortune-telling, and no attempts at clairvoyant prognostication. These are written as, and intended to be used as, academic works to inform decision makers and scholars about changes happening in our world. The discussion herein is a mix of cultural sociology, political science, economics, military science (sometimes called strategic studies), and international relations.

Methodology

This monograph is grounded in reputable scholarship and in actual site visits to the locations in question. The researchers who contributed to this book began with a review of pertinent international relations, political economy, cultural, and military studies literature. They also enrolled in specialized coursework in Chinese international studies as well as Chinese language instruction.

Each researcher formulated a series of questions relative to his or her section of this monograph. The researchers traveled to con-

duct interviews with senior members of the Department of State, the national intelligence agencies, and the DOD.[4] In addition, four members of the team traveled to China for approximately two weeks, meeting with political and military leaders as well as cultural experts and diplomatic staff.

In addition to searching for answers to basic questions, the team engaged in a modified Delphi method of generating conclusions about both the present and China's current direction.[5] These conclusions were then revetted against a series of experts and fellow team members to adjust hypotheses and then reengage in additional research and interviews to narrow the perspective and focus of this paper.

For the sections on military capabilities, the researchers used a war-game methodology to add detail to the political, diplomatic, military, and technological materials gathered in the interviews, discussions, and site visits. In these sessions, a formal Delphi method was used, which included a broad cross section of 22 senior DOD civilian and military strategic thinkers.[6] This scenario-based discussion involved several iterations of discussion wherein the researchers interacted with three opposing teams to generate a more complete picture of the challenges a modernized China might present by 2030.

Members across the Air Force simultaneously collaborated on developing a list of present and technologically feasible future concepts or systems that the US Air Force either will or could have in its inventory for the study's target year, 2030.

The final aspect of this analysis involved using a value-focused-thinking quantitative model to formally evaluate the existing and potential future concepts for utility against China with its current and projected systems.[7] This model was implemented under the direction of the AU Center for Strategy and Technology, with the assistance of Innovative Decisions, Inc., whose members include some of those cited in the seminal works on this method in the endnotes.

The central question this monograph seeks to answer is, how should the Air Force best prepare for a peer China in 2030? To address this question, this book is broken into several parts.

Chapter 2, written by Scott Caine, discusses the cultural roots of China. Caine traces those roots to the beginning of Confucianism, which forms part of the foundation of the Chinese belief system, which in turn underpins its political system. He looks at the interaction between Confucianism, Daoism, and Buddhism and the implications of this interaction for the Chinese political system. Caine examines the issues and challenges associated with Chinese demographics, reviews Chinese interactions with the West, and analyzes the history of their educational system. From these discussions, he shows that despite a turbulent past, China's cultural foundations have remained stable. As a result, he concludes that

in spite of China's modernization, its basic culture will likely remain relatively unchanged for the foreseeable future.

Blaine Holt and John Geiss II discuss China's political system in the next chapter. They also trace the evolution of China's politics across the centuries but focus intensely on the development that followed the death of Mao Zedong and the rise to power of Deng Xiaoping in 1976. Holt and Geis look at the belief systems of China's recent leaders and the process by which the next generation of these leaders is being both groomed and selected.

Chapter 4 examines the Chinese economy. Coterminous with the political changes the authors mention in chapter 3 was a series of actions by the Chinese government to restructure its economy. Edwin Donaldson looks at these changes and the effects they have had to date on China's production and economic strength. Donaldson also looks at a variety of projections over the near and intermediate term by brokerage firms, the International Monetary Fund, and the World Bank, painting a picture of how China's economy is likely to evolve in the years ahead. In the end, Donaldson concludes that China is on a path that will lead it to the status of the world's largest economic power by 2030, though its per capita income will still lag behind that of the United States.[8]

Ralph Sandfry then explores in chapter 5 how this rapid rise in China's overall economic capacity has affected its military strength and planning and looks at China's recent rapid modernization. He also discusses current Chinese strategy and outlines the path the Chinese military is taking to modernize an outmoded military for operations in the twenty-first century. Sandfry concludes that China's military buildup will lead it to become a major regional power capable of matching the military strength of the United States in Asia with the capability to project considerable strength outside to regions as far away as Africa and the Middle East.

Chapter 6 synthesizes the conclusions of the previous authors into a coherent description of the nature of China circa 2030. As they stated, this chapter is not a prediction. It is, however, a description of the result of these analyses and trends. China in 2030 is still expected to be largely a Confucian society. It will suffer the challenges of aging demographics, with much of its population more than 50 years old. While this may constrain the ability of the older generation to retire, the dearth of young people may mean increased educational opportunities for those of school or university age. Politically, it is likely that the Chinese Communist Party will still be in control. While some minor forays will be made in expanding democratic representation, China will still be a centrally controlled state. Despite this, China's open economy is likely to continue to grow. It will surpass the United States before 2030 and will likely be at least 10 percent larger than the US economy by this time frame. Despite the vast size of its overall economy, China's per capita gross domestic product (GDP) will still lag behind the West-

ern world. China's military will be rapidly growing in strength, and within the Southeast Asian region, it will be a peer match for the United States. China will likely have a wide range of antiaccess capabilities that would make attempting to interfere in its backyard a painful or daunting proposition. Still, China is seen overall as a state that would prefer good relations with its neighbors and trading partners alike. However, the potential for internal instability and resource challenges and the historic tendency for hegemonic transitions to be violent all suggest that there is at least some potential for the United States and China to find themselves at loggerheads in the decades to come.

Chapter 7 highlights the capabilities the United States requires to meet the potential challenges described in chapter 6. The reader should understand that there is no presumption of conflict here. However, there is the presumption that the United States will seek to be prepared for any eventuality a change in Chinese disposition or intent may present. To that end, using the Delphi and wargaming method described above, a list of capabilities the US Air Force requires to adequately protect American interests in light of China's new capabilities is addressed. Issues in space, cyberspace, mobility, and strategic attack—all areas where existing capabilities appear to be short of what will be needed to meet the challenges of a peer on the other side of the Pacific Ocean in 2030—are all accorded specific emphasis.

In the end, the authors conclude that China will continue its rapid ascent on the world stage. While this ascent may be uneven and impacted by environmental and political factors, China is on a path to become the world's leading superpower at some point in the next 50 years and be at near parity with the United States in the 2030 time frame. Handling the challenges of 2030 will require some additional investment in certain key capabilities, and these investments will likely be made with the backdrop of a constrained budget. These are difficult decisions that require an understanding of China and its people. That understanding best begins with its culture.

Notes

1. Walter LaFeber, *American Century: American Foreign Policy since the 1890s* (New York, NY: W. W. Norton Publishing, 1989).

2. This term was coined by Joseph A. Engelbrecht Jr., Robert L. Bivins, Patrick M. Condray, Merrily D. Fecteau, John P. Geis II, and Kevin C. Smith in *Alternate Futures for 2025: Strategic Planning to Avoid Surprise* (Maxwell AFB, AL: Air University Press, 1996), 79.

3. Gen John D. W. Corley, vice-chief of staff, US Air Force, memorandum of agreement,"Strategic Studies (Blue Horizons) Special Interest Item," 17 May 2006.

4. There is nothing in this work, nor any source used to compile this work, which is or draws upon classified material.

5. Norman Dalkey and Olaf Helmer, "An Experimental Application of the DELPHI Method to the Use of Experts," *Management Science* 9, no. 3 (April 1963): 458–67.

Dalkey and Helmer discuss the method in depth, as well as its origins, in RAND's *Project DELPHI*. Here, the manner in which the Delphi method was used did not involve a formal survey instrument. Nonetheless, there was interaction between interviewed members, with follow-up discussions held by the team members to produce a convergence of understanding of the concepts presented herein. The methods used here are not unlike those referred to in Harold A. Linstone and Murray Turoff, *The Delphi Method: Techniques and Applications* (University Heights, NJ: New Jersey Institute of Technology, 2002).

6. Dalkey and Helmer, "An Experimental Application of the DELPHI Method."

7. This part of the analysis spans four alternative futures and is contained in the *Blue Horizons 2008 Executive Summary*. Readers interested in that work should contact the Center for Strategy and Technology for the report. The value-focused-thinking model closely parallels that used in the *Air Force 2025* study and is fully explained in John P. Geis II, "Toward Blue Horizons," *Exploring the Past; Anticipating the Future* (paper presented at the annual meeting of the International Studies Association's 50th Annual Convention, New York, NY, 16 February 2009). For details on the *Air Force 2025* model and value-focused thinking in general, see J. A. Jackson, G. S. Parnell, B. L. Jones, L. J. Lehmkuhl, H. Conley, and J. Andrew, "Air Force 2025 Operational Analysis," *Military Operations Research* 3, no. 4 (1997): 5–21. For more on value-focused-thinking methodology, see R. L. Keeney and H. Raiffa, *Decision Making with Multiple Objectives and Value Tradeoffs* (New York, NY: Wiley Press, 1976); R. L. Keeney, *Value-Focused Thinking: A Path to Creative Decisionmaking* (Cambridge, MA: Harvard University Press, 1992); C. W. Kirkwood, *Strategic Decision Making: Multiobjective Decision Analysis with Spreadsheets* (Belmont, CA: Duxbury Press, 1997); and G. H. Parnell, H. Conley, J. Jackson, L. Lehmkuhl, and J. Andrew, "Foundations 2025: A Framework for Evaluating Future Air and Space Forces," *Management Science* 44, no. 10 (1998): 1336–50.

8. Donaldson penned this chapter in mid-2008. The chapter has since been updated as a result of the global economic slowdown. Of importance is that the growth disparity between the United States and China remains unaltered by recent economic events.

Chapter 2

The Influence of Culture, Demographics, and Education on the Development of the Middle Kingdom

Lt Col Scott E. Caine

Over the last 30 years, China has evolved from a primitive nation shrouded in secrecy to an emerging power poised to soon challenge the United States as world leader. With what many claim to be the richest history of any civilization, the Middle Kingdom has some of the oldest traditions and belief systems on Earth. As such, the study of the major influences of Chinese culture provides a unique understanding of how this country and its people think individually and collectively. This chapter attempts to distill the important aspects of Chinese society and culture for a rudimentary understanding of how this society has evolved and how it may evolve over the next 20 to 25 years. Such an understanding is useful to better understand the potential for future relations between China and the United States.

To provide the foundation for the subsequent chapters, this section begins by looking back over 2,000 years toward the beginnings of Confucianism and the historical underpinnings of Chinese society. It then examines the impact of Communism and the various belief systems of the Chinese concept of governance. This chapter also explores China's demographics and the challenges they pose to the state. Interactions with the West are explored, as the past 150 years of foreign relations with Europe and the United States have left an indelible mark upon the Chinese psyche. The chapter then looks at the Chinese education system and its recent renaissance. In the end, this chapter draws some comparisons between China and other similar Eastern Asian societies to examine possible future courses of action for the Chinese leadership.[1]

Historical Background

The Middle Kingdom boasts one of world's oldest continuous civilizations and written language. While there is archeological evidence that traces Chinese history back many thousands of years, the first dynasty and this narrative begin in 2070 BC. During this ancient period, the Xia, Shang, and Zhou dynasties loosely ruled the Middle Kingdom through what are called the Spring and Autumn Period and Warring States Period before the Qin Dynasty established the first truly unified state in 221 BC.[2]

While the Qin lasted only 15 years, it accomplished a great deal and laid the groundwork for all dynasties that followed. Before re-

volts toppled the dynasty and burned the emperor's palace near Xian in 206 BC, this short-lived empire built the Great Wall and a system of roads and canals, established the office of the emperor, and created the official Chinese language.[3] This is generally regarded as the point where ancient Chinese history ends.

Much of modern Chinese culture can be traced to the Han Dynasty that followed the Qin and ruled from 206 BC through AD 220. It was during the Han rule that the Silk Road in Central Asia was established, and the empire used military campaigns to expand Chinese territory considerably into the lands of modern-day Korea, Vietnam, Mongolia, and Central Asia (see fig. 1). More notably, it was during this period when fundamental changes were introduced into Chinese culture. In response to the highly repressive Qin, the Han emperor was the first to embrace Confucianism as a state ideology and orthodoxy.[4] The emperor introduced a more humane sense of rule, which emphasized that the purpose of government was to serve the people and that unfit rulers should lose support of the masses. It was also during this period when Buddhism first arrived from India.[5]

The empire period continued over the next 1,700 years with much of the rich history attributed to the strong dynasties such as the Tang, Song, and Ming. However, the period was also characterized by the rise and fall of empires through conquest with interludes of rebellion.

The Tang Dynasty emerged from a period of rebellion in 618 AD and ruled an empire even greater than the Han. Many Chinese

Figure 1. Historical boundaries of China. (Map created by authors based on Robert E. Gamer, ed., *Understanding Contemporary China* [Boulder, CO: Lynne Rienner Publishers, Inc., 2003], 30.)

consider the Tang as a golden period in their history, as great poetry became prevalent and culture and the arts flourished. During this period, the Tang grew westward and conquered lands in central Asia, where they acquired horses for the imperial stables. The artisans of the time memorialized these animals with mass-produced paintings and porcelain figures. Buddhism grew and began to increase toward the end of the Tang Dynasty, and the government engaged in oppression of the Buddhist establishment in fear of potential rivalry.[6]

Following further periods of disunity, the Song, Ming, and Qing dynasties emerged to rule over parts of what is now considered contemporary China. The Song Dynasty surfaced to rule southern China in AD 960 and became the first Chinese government to raise a navy and the first government in the world to issue paper currency. This period also boasted a rich cultural period and social life, where artisans flourished and the social elite congregated to view, display, and trade artwork. This was also a rich period of philosophy; Confucianism was rejuvenated and Buddhism was reintroduced.[7]

The Song Dynasty fell to the Yuan Dynasty led by Mongol emperor Kublai Khan in 1279, which in turn fell to the Ming Dynasty in 1368. During the Ming Dynasty, China became a major power with influence extending beyond the region. During this period, the Great Wall was reconstructed and reinforced to defend against the Mongols. The capital moved from Nanjing to Beijing, where it remained until the end of the empire period in 1911.[8] The Manchu overthrew the Ming Dynasty in 1644 and established the last Chinese dynasty, the Qing, which lasted until 1911. Through the eighteenth century, the Ming maintained regional hegemony and the modern-day borders. It continued to hold off foreign influence until the 1800s, when imperial Western powers began to exert their influence.[9]

When European nations began trading with the Chinese in the nineteenth century, they entered a system with which they were not familiar. This was not conducive to normal trade relations according to Western standards. For foreign states to trade in China, they were first required to perform the kowtow and present gifts to the emperor. Because Western powers did not accept the Chinese tribute system and the proposition that the Chinese ruler was the "Son of Heaven" and superior to all outsiders, conflict began to surface.[10] Fueled by tension between Chinese traditions and foreign imperial desires, armed conflict began with the First Opium War in 1839. Concurrently, China was ripe for change with a quickly growing population and an evolving economy undergoing rapid growth. Unfortunately, the institutional structure of the government and society did not show great capacity for that change.[11] Hence, the stage was set for a period of numerous conflicts at the close of the nineteenth century that included two opium wars, the

Taiping Rebellion, and the Boxer Rebellion. Not only did this turbulent period erode the Qing power center, but also it cost over 100 million Chinese their lives, devastated the countryside and economy, and humiliated all classes of Chinese people.[12]

By the beginning of the twentieth century, civil turmoil was rampant, and cries for revolution and reform resounded throughout the country.[13] By 1911 China was ready for change, and on 10 October a group of political rebels, who did not share a common vision, succeeded in overthrowing the Manchu-dominated Qing Dynasty.[14] The revolution eventually led to the abdication of the last Chinese emperor, Pu'yi, followed by the founding of the Republic of China in February 1912. By August 1912, several former rebel factions merged to form the Nationalist Party or Kuomintang.[15]

What followed in the twentieth century was a further spiral from a place of world prominence. The central government was an authoritarian system without the privileges of a monarchy, but the regions were controlled by territorial warlords. By the 1920s, the national government had politically fragmented and become dysfunctional. Chiang Kai-shek managed to reunify the country under the control of the Kuomintang and move the capital back to Nanjing. To impose order, he instituted a system of "political tutelage" that essentially meant China was to be ruled by a single party, the Kuomintang.[16]

Internal conflict continued during this period, and the newly founded Communist Party began to gain influence and wrestle with the Nationalist Party for control of power (see fig. 2).[17] The Japanese invaded in 1937 before this conflict could be resolved. After the Japanese were defeated at the end of World War II, civil war returned to China, with the Communists under Mao Zedong driving Chiang Kai-shek and the Nationalist Chinese from the mainland to the island of Taiwan. On 1 October 1949 the People's Republic of China was established, laying claim to the state of China and seeking an end to what has been called the "Century of Humiliation."[18]

Communism and the Influence of Mao Zedong

When the Mao-led Communist movement took control of China, the country embarked on a period of opposing cultural influences. On one hand, the People's Republic of China sought to return China to its rich cultural heritage of the past and eradicate the Western influence that imposed the century of humiliation. Conversely, Mao instituted beliefs and programs that tore apart many of the cultural practices that had lasted for thousands of years and gave Chinese people their cultural identity. Arguably, Mao's internal struggles mirrored how he and China would act during the early periods of Communist rule. As a young man, Mao struggled against the authoritarian rule of his father, embraced free-love

Dynasty	Dates	Chinese Events	Rest of World
Xia	2100–1600 BC	Chinese Characters Developed	Great Pyramids Built
Shang	1600–1027 BC	Advanced Bronze Casting	Moses Leads Exodus
Zhou	1027–211 BC	Feudalism Emperors Called Sons of Heaven Confucius 551–479 BC	Rome Founded
Qin	221–206 BC	China Unified Great Wall Unified	
Han	206 BC–AD 220	Confucianism Adopted Silk Road Opened Buddhism to China Paper Invented	Caesar Invades Britain
Three Kingdoms	AD 220–280	Period of Disunity	
Eight Dynasties	AD 265–586	Invasion and Division	Fall of Rome
Sui	AD 589–618	Grand Canal Built	
Tang	AD 618–907	Expanding Trade First Printed Book	Dark Ages in Europe
Five Dynasties	AD 907–960	Period of Disunity	
Qidan	AD 936–1122	Ruled Northern China	First Crusade
Jin	AD 1115–1234		
Song	AD 960–1279	Ruled Southern China	Medieval Europe
Yuan	AD 1279–1368	Genghis and Kublai Khan Invade from Mongolia	Renaissance
Ming	AD 1368–1644	Return to Chinese Rule Expanded Trade	Columbus to America British trade in Canton
Qing	AD 1644–1911	Manchu Rulers	US Revolution
Republic	AD 1912–1949	KMT [Kuomintang of China] National Rule	Russian Revolution
People's Republic	AD1949–Present	Communist Rule	

Figure 2. Chinese imperial dynasties and contemporary rule. (Reprinted from Robert E. Gamer, ed., *Understanding Contemporary China* [Boulder, CO: Lynne Rienner Publishers, Inc., 2003], 36–37.)

relationships, detested schools, and constantly sought freedom of spirit and opportunities to grow. However, by 1922 at the age of 28, Mao had willingly agreed to a much stricter degree of control from the Communist Party than he had ever accepted in his life from any other institution.[19]

By the mid-1960s, when Mao instituted the Great Proletarian Cultural Revolution, not only had he restricted the freedom of Chinese people under Communist authoritarian rule, he had also practically eliminated all the aspects of free expression that he grew up holding as dear. In theory, the Cultural Revolution was an ex-

tension of the Communist Revolution meant to crush completely the ideology of imperialism and bourgeoisie. Materially, it targeted temples, works of art, and other cultural artifacts that stood for the decadent past.[20] To purge these ideologies, individuals were persecuted for a wide range of "crimes"—from knowing foreigners to denigrating Mao or the party. The total number of victims was in the millions. Some of the victims were killed or committed suicide; others were crippled, and many were left emotionally scarred for life.[21]

As a fundamental fabric of his plan, Mao believed that for China to move forward, the Chinese youth must experience the pain and hardship of active revolution that he and his contemporaries experienced during the rise of the Communist movement. He was obsessed with the notion that the youth would need to be the continuity of revolution.[22] It could be argued that Mao sought to tear apart his country to allow it to continue to grow. Indeed, opinions of Mao are deeply polarized, with many seeing him as a deity for his revolutionary heroism and others as an "evil, authoritarian, egotistical leader." It seems fitting that the complex and often contradictory nature of Mao mirrored the nature of the country he led.[23]

Religious and Ideological Influences

While many civilizations can boast diverse ideological traits, the Chinese are unique in the fact that a combination of their ideologies has lasted for more than 2,000 years. The ideologies or religions of Confucianism, Taoism, and Buddhism and the yin-yang school have coalesced in harmony as foundational in Chinese culture. Together, they help to explain the actions and thought processes of the Chinese people.

Confucianism is an ancient Chinese ethical and philosophical system developed from the teachings of Confucius, a social philosopher who lived from 551 to 479 BC. He traveled throughout China attempting to spread his political and philosophical ideas and influence the many kings that contended for supremacy throughout China. Since his ethical vision was contrary to the legalistic thoughts of the period, he never gained great prominence or favor during his lifetime. However, Confucius' ideas resonated with a small group of disciples and were carried forward until the Han emperor Wu adopted Confucianism as the state ideology and orthodoxy from approximately 140 to 87 BC.[24]

While Confucianism is often thought to be a religion, it is more accurately described as a philosophical approach to life that stresses compassion, ritual, and social hierarchy as a means to maintain order in Chinese society.[25] The social values center on the notion of *ren*, which literally means "two persons," but in context is better defined as benevolence, humaneness, and compassion. Therefore, the Confucian concept of *ren* deals with the compassion

between two people in all forms of personal relationships. The means to carry out *ren* is through *li*, which are the rituals or proprieties that govern social interaction depending on one's place in the social order. Based upon one's hierarchical place in society or family, each individual is expected to act in a certain manner. This approach stresses emphasis on the group over the individual and a respect for hierarchy, where the state creates the rights of the individual. The Confucian approach is based on discussions and sayings recorded in *The Analects of Confucius* that does not use a straightforward deductive Western approach but instead use analogy and aphorism. For this reason, European and American readers often find his teaching muddled and unclear.[26]

At the time Confucius was beginning his teaching and influence, another belief system known as Daoism was popularized by philosopher Laozi in the fifth century BC. While Confucianism deals with the social aspects of life, Daoism pertains more to the nature of the individual.[27] This philosophy is based on the notion that the Dao was the origin of creation and the force behind all functions of the natural world. To follow the Dao is to follow the path or way to a life that is in harmony with nature.[28] One obtains the Daoist ideal by abstaining from the futile pursuit of human endeavor, social activity, and individual ambition. Only through seeking the passive attitude of retreat can one find true peace and oneness with the Dao.[29]

While Daoism provides alternatives to the Confucian way of life, the two philosophies have coexisted together for approximately 2,500 years. For most Chinese, it is not a matter of choice between the two, but two different approaches to life for the different sides of one's personality. Daoism, or "the way," was developed in a time of social unrest and religious uncertainty to provide a spiritual way of living. Confucianism, on the other hand, provides a means to achieve social order.[30] The fact that these two apparently opposite approaches are embraced together provides a perfect example of the dualism in Chinese culture represented by the yin-yang school.

The yin-yang school is generally deemed as less important than Confucianism and Daoism; however, it represents a dualist approach that permeates most Chinese thought. The depiction of yin and yang (see fig. 3) represents the idea that polar opposites live in harmony as equal and complementary parts of life. The lightness and darkness of the symbol are in essence one with each other, and neither side would exist without the other. This dualism explains the harmony of many opposites in China such as Confucian and Daoist thought as well as rebellion amongst authoritarian rule.[31]

Figure 3. Yin and yang in harmony

While the institution of Confucianism and Daoism did not technically bring the Chinese a religious establishment, the introduction of Buddhism from India in the first century AD brought a religion that became widely accepted by the sixth century. To many, Buddhism was not initially acceptable because it was an alien institution originating from a foreign land and depicted by alien gods wearing foreign clothes. On the other hand, many in northern China accepted it because it helped to break down cultural barriers with the ruling elite.[32] Chinese Buddhism has gone through periods of wide acceptance and strict persecution but survives today roughly in a form developed during the ninth century. Most recently, Buddhism was severely suppressed during the Cultural Revolution when many monasteries were closed or destroyed. However, in recent years, more liberal religious policies by the Communist Party have led to renewed interest in the observance of Buddhism.[33]

In practice, Buddhism is the only foreign religion that has taken root in China and also has had widespread cultural and religious effects on the population.[34] It is likely that Buddhism became popular in China because of the well-rounded nature of the practice both intellectually and spiritually and the fact that it, in many ways, resembled the Daoist approach. Buddhists seek to escape from the world that brings on human suffering by renouncing individual consciousness and cravings to experience the abyss of nothingness. However, in contrast to Daoism, Buddhism is very institutional with an elaborate collection of sects, specialized personnel, institutional practices, and theological doctrine. Therefore, Buddhism can coexist without directly impinging upon Daoism or Confucianism because all three defy the idea that there is a supreme deity or heavenly salvation.[35] Together these three ideologies have become a single standard bearer of Chinese religion that underlies cultural thought.[36]

Confucianism, Daoism, and Buddhism were fragmented during the early part of the twentieth century because of Communist political and social upheaval. When the Communist regime took over in 1949, the nation became officially atheist; however, state-monitored religious practice continues to be allowed. Currently, religious practice is legal as long as it does not interfere with national interests—essentially, worship of God is subordinate to the worship of the state. Although it is difficult to measure, it is estimated that only about 10 percent of the Chinese population claims to follow any form of religious belief. Regardless, the three historic Chinese ideologies continue to influence Chinese society.[37]

Demographics

China and the United States have several remarkable similarities concerning their respective landmasses. The size and shape of each country are relatively similar, with China boasting a slight

advantage in overall size at 3.7 million square miles compared to 3.6 million square miles for the United States. In addition, the two counties lie at approximately the same latitude, with New York and Beijing on similar parallels and New Orleans and Shanghai at comparable latitudes. Furthermore, the majority of the populations in both countries lie on their eastern seaboards.[38]

This is where the similarities end. Topographically, 70 percent of China's landmass is covered by either desert or mountainous terrain while that figure is approximately one-third for the United States. Furthermore, at 40 percent of its landmass, the United States has an abundance of cultivatable land; China only has approximately 10 percent of similar land. With China's three major river systems running west to east and draining into the South China Sea, its population resides primarily on the eastern third of the country with approximately 75 percent of the country residing in only 15 percent of the landmass.[39]

Ahead of India as the most populous country on the planet, China is remarkable for more than just the size and distribution of its population. In 2000 China's population eclipsed the 1.3 billion mark and was estimated to have been 1.32 billion as of July 2007.[40] While that figure is astonishing in raw numbers, the context of the population dispersion makes it even more surprising. Even though China's landmass is approximately the same size as the United States, the average population density is over three times greater than the United States'. However, when one factors China's topography into the equation, the image is even more staggering. While technically about 390 million Chinese live in its 570 cities, the vast majority of the population live in areas that, while classified as rural, are actually densely populated towns. As a comparison, the population density in some regions of China is almost 2,000 persons per square mile. This is five times more people per square mile than the northeast United States, which has a population density of only 400 persons per square mile. Finally, even the most sparsely populated portions of China are much more densely populated than their wide-open American counterparts. Wyoming boasts five people per square mile, whereas Xinjian has 26.[41]

Of further interest is the growth rate of the Chinese population over time. While the census records are imprecise, China's growth rate appears to have been relatively constant for centuries. At the beginning of the Han Dynasty, it reached 60 million; a thousand years later, in the Song Dynasty, it was 100 million; and 500 years later, in the middle of the Ming Dynasty, China's population stood at 150 million. However, during the Qing Dynasty from approximately 1644 through the end of the nineteenth century, the population tripled to nearly 450 million.[42] By 1950 the population had increased another 100 million to 550 million. Over the next three decades, the population exploded to more than one billion in 1981.[43] China then attempted to stem this rapid growth with its

"one child" policy and other population control measures. Population increases have been greatly reduced, with the current rate of increase at only 0.6 percent annually. Projections show that by 2030 the population will rise to 1.46 billion and peak at approximately 1.6 billion by the middle of the century before beginning a gradual decrease.[44]

A remarkable feature of the Chinese population is the perceived homogeneity of its society that masks a true diverse population. Approximately 92 percent of Chinese consider themselves of Han origin, while the other 8 percent are linked to 57 minority ethnic groups.[45] While this tends to make one think the Chinese are a nearly homogenous society, this proposition is misleading. First, while Mandarin is the official language, Chinese from different regions of the country cannot readily communicate with one another due to differences in dialects. Thus, while Mandarin Chinese is spoken by approximately 75 percent of the population and is the common language taught in schools, seven major dialect groups cannot necessarily be understood by the larger population. The non-Han groups, at only 8 percent of the population, occupy approximately two-thirds of the land mass and speak their own language. Hence, the homogeneity of China is not quite what an American would believe it to be.

One reason for the perception of Chinese homogeneity is that Chinese people have a different impression of history than most Westerners, which can be linked to their "sense of place." When asked where they are from, the typical Chinese answer with the city or province of their ancestors because that is where they are registered inhabitants. In many cases, their technical residence is in a city where they have never been themselves.[46] There is also the misperception that greater China has been united for thousands of years. While there were periods when a great portion of the country was under single rule, this fact is greatly exaggerated. China has been unified for only 978 of the over 5,000 years of written Chinese history.[47]

Western Influence

It can be argued that Western influence has had a profound effect on Chinese culture during two distinct periods—the century of humiliation and the post-Mao period. When British ships arrived in the 1800s, the Chinese believed that their superiority and hierarchical culture was threatened, causing dynamic change in the country.[48] Conversely, when Deng Xiaoping reopened China to Western markets in 1978, he provided an opportunity for China to flourish economically and to grow in strength. While on the surface these two events appear to have produced opposite effects, there is actually a common undertone to both. It may be concluded that

the true difference in these periods is in how the events were controlled by the authoritarian regimes in place at the time.

When British merchants arrived in search of Chinese products in the nineteenth century, they encountered a hierarchical civilization based on the tributary system that was much different from the system of equal trade between nations. In a period when China was faced with the destabilizing effects of an exploding population, the increasing demand for British trade-balancing opium caused increased tensions and the resulting Opium War.[49] The British believed they were the "champions of modern civilization over Chinese backwardness" and as such intended to force China to join the "world order according to Western rules."[50] The result was that for the first time in over 2,500 years, Chinese culture was subjugated to external pressure that forced it to confront its own validity and continued existence.[51] Over the next century, Western expansion caused the Chinese to question whether traditional hierarchical culture could adjust to the problems of trade and security presented by the expanding area of influence.[52]

Ripe for revolution in the early twentieth century, China faced three cultural options to meet the challenges of an uncertain security environment and internal conflict. Western influence made individualism and the emancipation of women an attractive alternative to its Confucian hierarchical past.[53] Conversely, a renewed patriotism arose among Chinese youth that sought to reconstitute power under a central hierarchical government.[54] Finally, with the fall of its dynastic system, China's ever-growing peasantry was becoming more disillusioned with its situation and questioning the way forward.[55] In the end, the Communists under Mao offered the peasant class an egalitarian means to free the people from the traditional hierarchical evils of "old ideas, old habits, old customs, and old culture."[56] Unfortunately, the Communist revolution was unable to achieve its espoused goals, and what ultimately took shape was a system that reinforced the inward-focused Confucian system of bureaucracy, which cemented an elite ruling class dedicated to serving the masses.[57]

In the post-Mao era, the decision by Deng Xiaoping to open China for economic development provided a new approach while retaining continued emphasis on a hierarchical government. These reforms opened the door for widespread agricultural reforms, commercialization, and greatly increased foreign trade that rapidly improved the economy, raised living conditions, and allowed China effectively to rejoin the world economy.[58] With rapid economic reform came hope for a more autonomous local government and greater pluralism. This caused social, economic, and political tensions that erupted into the Tiananmen crisis in 1989.[59]

While the military response was tragic, the events of Tiananmen Square were predictable as China began to seek methods of reducing Western influence within its borders. Kimberly Crider argues

that to allow a rebellion to occur would have undermined national stability and therefore brought into question the ruling party's ability to govern, ultimately undermining its legitimacy.[60] Also, Chinese leadership has traditionally feared chaos among its large population and, hence, used a collective, structured system to govern the masses. Finally, the central government relied on the traditional Confucian culture, which deemphasized individualism in deference to the greater good.[61] Ultimately, the underlying Chinese culture affects both those inside and outside of government, giving primacy to stability and prevention of social disorder in a time of growth.[62]

Two distinct truisms emerge when looking at both Chinese experiences with Western influence over the past 200 years. First, the underlying traditional Chinese cultural values have been extremely resilient. While China has taken vastly different approaches to Western influence, the solution appears to gravitate back to an authoritarian hierarchy where individualism cedes to the collective good. However, when the masses perceive that their rulers are governing unjustly, they execute the right to rebel in order to validate the loss of the "mandate from heaven."

The second truism is that the countries' internal stability and control appear to be tied to China's security and economic prosperity. Both factors were in question during the century of humiliation and revolution that tore the country apart. In the post-Mao era, the government has been able to use the gains from economic prosperity to stifle dissent under the umbrella of legitimacy.

Over the last 150 years, Chinese reaction to Western influence has changed. During the century of humiliation, Western influence was imposed upon the Chinese to exploit the country, its resources, and its people. Under the current Communist government, the Chinese invited Western influence into the country to exploit Western practices. This allows China to resume its legitimate role as the Middle Kingdom by utilizing the resources of other civilizations without abrogating its cultural Confucian heritage. Hence, it appears that China will gradually increase its liberalization while keeping its roots of collectivism and social stratification that have survived violent periods of Western influence.[63]

Education

The Chinese education system has made enormous advances from a system emphasizing history and culture to the engine of what is now the world's foremost country in innovation. Prior to the end of the dynastic period, China did not have a university system equivalent to that seen in Western civilization. Nevertheless, traditional Chinese culture put a high premium on education as a channel to advance professionally and socially.[64]

The time-honored Chinese system required male students to study Confucian tenets that emphasized filial principles, as well as

Chinese history from the first millennium BC. Once proficient in these areas, a young man could attempt to pass multiple levels of difficult state examinations in order to leave the rural gentry class and train to work in the bureaucracy. However, in the midst of revolutionary change in 1905, the courts in Beijing eliminated the Confucian-based state examination system.[65]

By the late 1800s, Western-style universities were in the early stages of development, with Peying University, China's first modern university, opening in October 1895 (it would eventually become Tianjin University in 1951). It was shortly followed by Zhejiang, Beijing, and Nanjing universities.[66] For the next half century, Chinese universities developed according to Western models despite tremendous challenges caused by the Sino-Japanese War and the War of Liberation ending in 1949.

The period after Mao's ascension to power was a period of decline for the Chinese university system. After the Communist revolution, China cut ties with the West and remodeled its universities based on the Soviet Union's system, where comprehensive universities were replaced with single-discipline schools, such as colleges of engineering and universities of literature and arts. However, by the end of the decade, the government's inability to provide jobs commensurate with the level of education, combined with other overriding pressures, squeezed the educational budget and hampered educational efforts.[67]

China's educational system saw tremendous lows after Mao shut down China's formal schools in the mid-1960s during the Cultural Revolution. The schools' reopening in 1968 hampered the reversal of educational emphasis, since the larger numbers of students in higher education represented a smaller percentage of the population than had been able to attend earlier.[68]

A significant turnaround began in 1977 when China reinstituted the nationwide entrance examination to students competitively selected for higher educational attendance.[69] Once Deng Xiaoping opened China to outside influence in 1978, the educational system truly embarked on a slow road to recovery and modernization. By the late 1990s, China had made significant strides when it reorganized the higher education system to a truly comprehensive university system according to Western models.[70] Finally, in 1998 the Chinese government announced that it intended to transform some of its universities into top-tier institutions worldwide by increasing the educational share of the national budget by 1 percent for the five years following 1998.[71]

Major advances in Chinese college education have been made in recent years. The current education system in China has evolved significantly and can be considered relatively progressive. Chinese children are currently required to receive nine years of compulsory education beginning at age six (six years of free primary education followed by three years of lower secondary education). At age 15,

students are afforded three additional years of optional upper secondary education.

While attendance rules are not universally enforced, attendance rates are reported to be 99 percent for primary schools and 80 percent for secondary schools.[72] This is a stark reversal of the traditional Chinese education trend that once was highly hierarchical with relatively few students attending formal education. More impressively, public enrollment in colleges and universities has increased considerably. Enrollment grew drastically from 6.43 million in 1998 to over 16 million in 2002.[73] Official Chinese statistics show that 52 percent of Chinese university candidates were eligible for admittance in 2003 compared with only 2.4 percent in 1981.[74] Additionally, China has put increased emphasis on sending students abroad to study, with more than 50,000 Chinese students studying in the United States annually.[75]

While these statistics all point to an impressive commitment to education, it is more remarkable to note the cultural changes on campus during this period of growth. Twenty years ago, campus life would have been considered spartan and boring with very little extracurricular activity and up to eight students sharing a single dormitory room. Now many university students enjoy a campus life that closely resembles Western universities, including participation in sports and other activities, weekends off, and three to four students sharing dormitory rooms that include television and Internet access.[76]

While China has made tremendous strides over the last 25 years, some of the changes have not reached the majority of Chinese society. China's educational system continues to be hierarchical, with only 15 percent of the population attending higher education and 20 percent not even attending secondary schools. To date, this lagging enrollment has been inconsequential because the economy has been unable to fully absorb the graduates of higher education. According to current government reports, 60 percent of college graduates have difficulty finding jobs. In addition, China continues to follow a two-tiered higher education system, where the top universities receive the majority of the funding resulting in a considerable quality advantage over the majority of the colleges.[77] While there is much rhetoric on improved education funding, only the top Chinese universities have seen the benefits. By 2006 educational spending stood at 3 percent of the GDP, with the top 36 institutions receiving the government's primary focus. In spite of this narrow focus, spending has paid dividends. According to a recently released National Science Foundation report, the Chinese now lead the world in technological innovation.[78]

Yet despite this success, educational improvements have not reached everyone. According to World Education Services, an increase in funding still may not make the necessary difference if strides are not made across the board to improve academic free-

dom.[79] While significant improvement is evident by some measures, the Chinese still have a long way to go before they can be considered the educationally elite on the world stage. One measure of educational achievement, the United Nations Development Programme, rated China as 54th of 139 countries rated on the human development scale with regard to adult literacy for those over age 15 with a raw score of 90.9 percent.[80]

Analysis and Assessment

It becomes clear there is tension developing within the Chinese system by studying Chinese cultural history and present-day progressive political and economic policies. On one hand, the long Chinese history would lead one to believe that very little will change in the next 25 years because of the rich and episodic nature of the country. In contrast, with tremendous economic growth and influence from Western culture, one could also conclude that China is on the verge of radical and evolutionary change that could make it the dominant player on the world stage. In-depth study reveals threads of continuity through China's tumultuous past that suggest that while China may advance or change in other areas, its culture will not alter remarkably between now and 2030.

The main reason for continuity is the role of the individual in the Chinese system. While the Middle Kingdom has seen numerous rebellions and leadership changes in the past several thousand years, the constant has been the leaning toward authoritarian rule, whether during the empire period or the most recent foray into democratic values and Communist rule. Even when China became a democratic republic in 1912, the democracy existed in name only because Chaing was forced to impose a one-party system to enforce order.[81] Never throughout its recorded history has China had a prolonged period of Western democratic practice. This may be attributed to underlying Confucian beliefs that continue to influence Chinese thought. Confucian thought relies on the order of society—understanding one's place and relationships to others. Because the Chinese people have a long history of thinking this way, even democratic principles are seen through this Chinese lens. Furthermore, Confucian beliefs promote the fact that individual rights are not inalienable as the United States sees them; they are provided by the state at its discretion.

One interesting dualism in the yin-yang school that plays into the interaction between the ruling class and the people is manifest in the "mandate of heaven" and the right to rebel. Since the Zhou Dynasty in the twelfth century BC, the Chinese have believed that the ruling family is given a mandate from heaven as its legitimate source of power. That right to rule was retained as long as the emperor continued to rule virtuously and effectively.[82] In a truly Chinese manner, the mandate is maintained with an opposing side holding

against it. Since the conditions for retaining the mandate require effective rule, perceived ineffective rule always provides a potential for overthrow by way of rebellion. Hence, the corollary to the mandate of heaven is the "right to rebel." Since misrule would result in losing the mandate, there is no immorality in initiating rebellion to overthrow an unjust or ineffective government. Unfortunately, this right is only seen as valid in retrospect. Therefore, if rebellion is thwarted, then the mandate of heaven is still obviously justified.[83]

The dualism between the right to rebel and the mandate of heaven seems to answer the question, how can a hierarchical Confucian society have a history filled with rebellion and civil wars? Simply, while the masses believe the ruling family is governing well, they behave well under authoritarian rule of the harmonious society. However, "obedience only ends when peace and prosperity are supplanted by war, bad harvests, and natural disasters, proving that Heaven's Mandate to the emperor to govern has been withdrawn."[84] Thus, the student demonstrations of the 1980s that escalated to the Tiananmen Crisis of 1989 were not a violation of Confucian hierarchical beliefs. Considering the cries of corruption and economic disparity following the 1978 economic reforms, the demonstrations were a manifestation of the right to rebel.[85]

Another aspect of Chinese history and culture that may prevent too much acceptance of foreign thought can be traced to the actual Chinese name *Zhonghua*, which translates to middle or central kingdom. The Chinese ruler was believed to be the legitimate ruler of the superior civilization and therefore not subject to the imposition of outside influence.[86] This was seen when Western imperialists began trade with China and were forced to pay tribute to the Son of Heaven that ruled the Middle Kingdom. China has always seen itself as the superior nation, and while now recovering from a century of humiliation, it will do so using the best of outside influence but in a Chinese way. Hence, it is likely that the democratic principles of the West will be accepted only in a way that makes China stronger under an authoritarian rule.

Democratization Potential

Inevitably, discussion of Chinese development tends to gravitate toward the discussion of Chinese democratization as the economy develops. The presumption is that as more wealth and influence from the West filters into the country and the disparity grows between the classes, the call for individual freedoms will be greater.[87] Those making this argument often point toward other Asian states with democratic leanings, such as Taiwan and the Republic of Korea. While it is true that Taiwan has adopted a liberal democracy, the circumstances facilitating that evolution were quite different from those facing the People's Republic of China.

In 1949, when the Nationalists fled the mainland humiliated by the Communists, their defeat made it impossible to exert the arrogant authority expected over the indigenous Taiwanese of a Confucian ideology. Rapid social and economic development continued to erode the influence of Confucianism, thus giving the prospect of individual rights a greater foothold. In comparison, the People's Republic of China has grown stronger under Communist authoritarian rule. While the current government does not promote Confucianism as a state religion or philosophy, traditional undertones of the philosophy actually complement the Communist system quite well.[88]

Another Asian culture often compared with China is the Republic of Korea (South Korea). Once again, a Confucian-based culture shed the authoritarian system of rule in favor of a liberal democracy during a time of economic development. While again there are similarities to China's current situation, distinct differences must be considered.

The first 20 years after the Korean War were quite tumultuous for war-ravaged South Korea. During this period, the country searched for an identity while regaining stability after a long period of embarrassing occupation by the Japanese and a devastating war with North Korea. The United States continued to provide tremendous financial and military support. Christianity's rapid growth began to slowly erode the influence of Confucianism, while the economy continued to improve.[89] Thus, two distinct differences are apparent when comparing China with the Republic of Korea: the rapid growth of Christianity and the direct support and influence of the United States.

One final comparison is with the Republic of Singapore. Though on the surface Singapore appears to be the model for China to follow toward democracy, that analysis may be misleading. First, by 1990 Singapore was the only high-income non-oil-producing nation that was not a democracy. Singapore is essentially a one-party state. While there are elections, the People's Action Party dominates to the point that the opposition parties claim that Singapore is merely a procedural democracy. As further evidence, Freedom House gives Singapore a political rights rating of five on a scale of one to seven, where a rating of one represents the highest level of freedom and a rating of seven means political rights are absent.[90] The heavy Confucian influence among Singaporean leadership keeps the authoritarian presence in power regardless of how the country and economy have flourished under that style of leadership. Consequently, Singapore may not be a model of democracy, but it may be the model for China to follow with regard to the democratization process. Both countries show tremendous economic growth with hints of democratization under authoritarian, Confucian-influenced regimes.[91] Furthermore, as David Shambaugh pointed out at the 12 April 2007 "Changes in China's Political Landscape"

symposium held in Washington, DC, the Chinese Communist Party has sent numerous delegations to Singapore since the early 1980s to understand how the People's Action Party maintains "its low key but total control." China clearly admires Singapore and its means of governance.[92]

Conclusion

Clearly a country with more than 4,000 years of recorded history has had ample opportunities for societal perturbations and culture-changing events. Therefore, it is remarkable there have been very few long-term changes to the social norms of the Chinese people. Their society continues to adhere to a hierarchical social structure based largely on the Confucian school of thought. The Middle Kingdom continues to be relatively consistent in its cultural dynamics despite numerous challenges: a turbulent century where the dynastic system was abandoned, numerous rebellions, pervasive external influence, the adoption of Communism, and a "cultural revolution" that sought to erase the connection to cultural threads of the past.

The combination of effects from culture and history will influence how the Chinese continue their recovery from the "bad century" and consequently gain status and a position of world or regional superiority over the next 25 years. Embedded in the nation's name is the reminder that the people of the Middle Kingdom believe they belong at the center of civilization, not on its periphery. Furthermore, their history with colonial powers and invading states continues to make them suspicious of outside influence. China's entry into the Korean War and successful conflict with the United States was a first step towards repositioning the nation in its rightful place. Increased economic and military development will most likely strengthen China's authoritarian rule based on Confucian values while slowly introducing individual rights in a way that has "Chinese attributes."

Considerable speculation exists with regard to how China will evolve in the coming years. It is almost universally believed that China is the emerging competitor to the United States that will potentially supplant it at the top of the world power structure. However, the real questions are these: What will China look like at that point? How will its culture adapt to its increased status on the world stage?

Considering that the Chinese people have endured many changes over their 4,000-year history with little true change in their culture, it is likely these same cultural norms will survive their ongoing renaissance. Remember that China has seen authoritarian dynasties come and go throughout its history. In almost every case, those regimes flourished when the economy was strong and then fell to invasion or rebellion when the economy faltered. In this

period of tremendous economic growth, one should expect stability and control by this current "dynasty." The most likely path for the next 25 years will be an incremental and incomplete transition to a one-party state emulating Singapore.

Notes

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3. It should be noted that the Great Wall of the Qin Dynasty was reconstructed in the Ming. The wall of the Qin Dynasty was simpler and was not the massive brick construction with which tourists are now familiar.
4. Judith A. Berling, "Confucianism," *Ask Asia*, 2007, http://www.askasia.org/teachers/essays/essay.php?no=38 (accessed 27 January 2009).
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16. Ibid., 160–71, 185.
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Chapter 3

正义与和谐社会
(Harmonious Society: Rise of the New Boxers)

Col Blaine D. Holt and Col John P. Geis II, PhD

China's president Hu Jintao calls his vision for leading China into the twenty-first century "harmonious society" (谐社会, xié shè huì). From the recent dynastic periods to today, China's long history of lost global prominence, subjugation to colonial/imperial powers, civil war, the closed communist era, and the opening of China in 1978 must be understood through the lens of contemporary Chinese politics. President Hu has cast himself as China's champion. His ideals of checking Western power and mitigating foreign influences in a rising China resonate within China today. The question becomes whether China's ambitions will remain regional or extend to surpassing the United States as the de facto superpower to meet these ends in the 2030 time frame.

Harmonious society is described by Hu as a "scientific development concept"[1] that shifts China's primary focus from a pure economic growth model to a more balanced, Confucian-style approach aimed at maintaining growth while addressing daunting social issues such as the wide gap between rich and poor, widespread environmental degradation, and government and corporate corruption.[2] Post–Mao Zedong China, beginning with Deng Xiaoping in 1978, remains authoritarian but has continued to build on policies promoting openness and integration with the international community. Harmonious society is designed to foster more democratic and financial opportunity for citizens, allowing for some participation in government while maintaining firm, centralized control. The plan seeks to harness China's economic affluence, using it to increase its influence on the world stage.

Deng Xiaoping, Jiang Zemin, and Hu Jintao—representing the second, third, and fourth generation of leaders after Mao Zedong in the Chinese Communist Party (CCP)—embarked on incremental reforms to maximize China's economic potential while retaining strict authoritarian control. Together these leaders, the Politburo Standing Committee, Politburo, and Central Committee represent modern Chinese politics. Their reforms have enabled China to experience explosive economic growth over the past 30 years, which in the eyes of many allows them to retain the mandate of heaven. Yet, as witnessed at Tiananmen Square in 1989, the leadership will react harshly to dissent from its people to retain that mandate.

As a result of the People's 17th Communist Party Congress (CPC) in late 2007, Hu's position is secure until 2012. He consolidated

power by garnering seats for his allies on key committees, to include the Politburo Standing Committee, while retiring older government officials with strong loyalties to previous generations. However, the new leaders placed in Politburo and Central Committee positions represent the rising fifth generation. This generation will be pivotal in executing Hu's strategy and in guiding China's path in the near and midterm. Issues such as the Taiwan question, corruption and rule of law, environmental protection, resource procurement, and internal dissent represent the challenges facing this rising class of leaders as underscored by President Hu's address at the 17th CPC.[3]

China is a rising power, and this must be considered as future policy is crafted. Although an unforeseen event such as a natural disaster or internal discord can slow China's rise, it is clear that its vibrant economic affluence will translate into regional and global influence in the future. It is reasonable to predict that China's globalization-fueled economic growth will continue, which in turn, will present future Chinese politicians with an array of options to move the country's strategic direction.[4]

If the rhetoric emanating from the 17th CPC is to be believed, China will translate its affluence into peaceful regional leadership; however, the ongoing construction of a globally capable military whose capabilities extend beyond those of national defense can lead to a different postulation about actual intent. If Chinese political intent is to match and eventually supplant the United States as the dominant global power, it will have the ability to do so. Hu's vision of a harmonious society is a modern plan whose outcome subordinates foreign interests to its own, making it the "kingdom with no boundaries," as was thought in the eighteenth-century Qing Dynasty. It is clear that the United States must place a high priority on its US–Sino strategy and be prepared for the challenge a rising China is sure to present.

Contemporary Politics in China

After Mao Zedong's death in 1976, Deng Xiaoping emerged as China's new leader and set out to craft a new Chinese strategy. Purged and forced to work in a labor camp during the Cultural Revolution before coming back into favor and rising as Mao's successor, Deng understood firsthand the failure of the revolution and its isolationist posture and set a course to open China to the global market system. He concluded that while foreign encroachment was at the root of the "Bad Century,"[5] it was essential to open China up to economic opportunity. This belief was a major departure from Mao's philosophy and set China on the path toward the political situation today.

Although credited with leading the resurgence of China's wealth in the modern era through his "socialism with Chinese character-

istics" strategy, Deng was also responsible for giving orders that would enable the People's Liberation Army (PLA) to crack down on political dissidents at the 1989 massacre in Tiananmen Square. Publicly Deng praised the PLA for responding to the crisis with decisiveness, but privately he reshuffled several key leadership positions, which ultimately established Jiang Zemin as his successor in 1992.[6] China's leaders demonstrated at Tiananmen that reforms which support China's meteoric economic growth remain official policy, but the power elite will, in all cases, attempt to retain central control.

In a discussion with a Japanese delegation, Deng explained China's Marxism and socialism in uniquely Chinese terms, making the linkage between the Bad Century and socialism with Chinese characteristics: "To adhere to Marxism and to integrate it with Chinese realities—in other words, to seek truth from facts, as advocated by comrade Mao Zedong—it is crucial for us to adhere to Marxism and socialism. For more than a century after the Opium War, China was subjected to aggression and humiliation. It is because the Chinese people embraced Marxism and kept to the road leading from new-democracy to socialism that their revolution was victorious."[7] Going forward, socialism with Chinese characteristics can thus be interpreted as firmly held power by the elite party members without the shackles of ideological definitions of Marxism and socialism. In this construct, challenges to the lack of congruency between China's open-market reforms and its failure to improve human rights and freedom are unsuccessful. Yet for the West, it is hard to label China as fully Communist, given its economic policies—this is where the moniker "with Chinese characteristics" becomes useful to China's leaders.

The party power structure solidified in the transition from Deng to Jiang. Deng ran the party and nation from position of chairman of the central military commission and paramount leader. The president was reestablished as the leader of both the party and the nation with Jiang's installation in 1993. The premier is the secondary leadership role. The three top governmental or party bodies are the Politburo Standing Committee, Politburo, and Central Committee. Their members are selected every five years at the CPC in a closed process, not visible outside of the party's elite.[8]

In the Jiang and Hu administrations, this process and the associated party structures have stabilized. It was common in Mao's and Deng's era for outgoing senior officials to be investigated and imprisoned to discredit criticism of incoming leaders. Constitutional reform's stabilizing government structures now allow for peaceful exits from government and logical successions with the party elite. For example, Hu gained 10 years of experience on the Politburo Standing Committee before rising to become president.[9]

Institutionalizing key positions and power structures enables party factions to compete in a stable system and supports long-

term planning, which has been a Chinese cultural characteristic. The most recent 17th CPC reaffirmed this stability. Although President Hu was able to meet his goal of placing younger protégés on the Politburo Standing Committee, he was not allowed to trim the number of positions on the committee from nine to seven (see fig. 4) for the purpose of retiring more members whose support came from Jiang, the previous president.[10] Although the resultant personnel changes seem to indicate that Hu will have power limited by those with close ties to Jiang Zemin, this failure to select Jiang Mianheng, son of Jiang Zemin, may well signal that Jiang's influence is rapidly dissipating, leaving Hu with a consolidated position.[11]

President Hu made pledges to increase democratic opportunities for citizens. He said, "People's democracy is the lifeblood of socialism."[12] In the coming years the CCP will work to offer "socialist democracy" where urban and rural areas can have a role in electing deputies to the people's congress.[13] The public will likely gain access to hearings that shape some facets of public policy.[14] Whether or not these reforms become reality remains to be seen, but the tenor of Hu's address is indicative that measured democratic participation will be allowed.

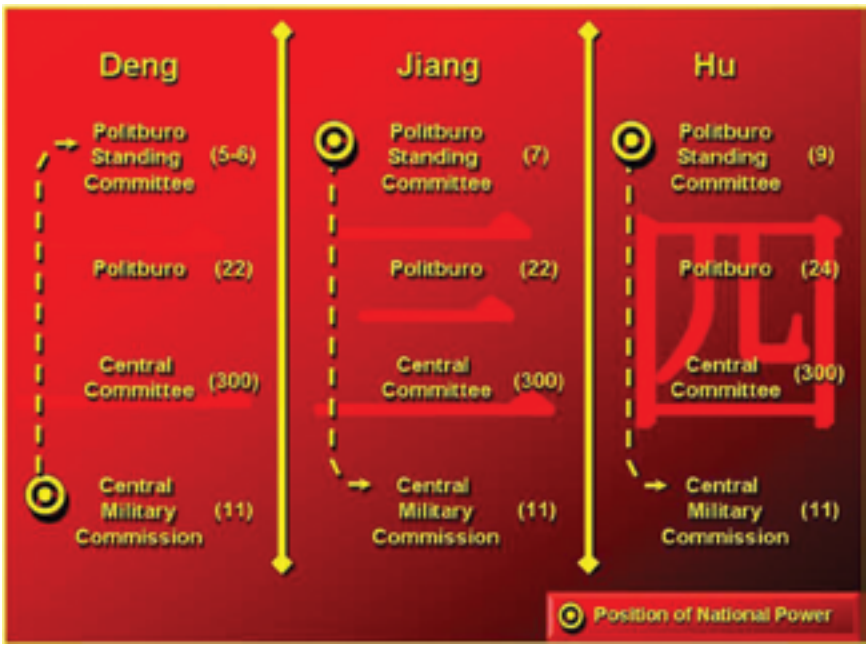

Figure 4. Organizational structure of China's government. (Chart created by author based on Dennis Wilder [senior director for East Asian Affairs, National Security Council, The White House], interview by author, 25 September 2007.) This figure indicates the numbers in each partition of the government, where the highest level of national power was centered. The "bull's eye" indicates from where the leader ran the government, with an arrow pointing to a dual-role chairmanship. In the case of Jiang, his presidency ended in 2002, but he remained chairman of the Central Military Commission until 2004.

Dr. David Shambaugh, professor of political science and international affairs at George Washington University, points out that the rationale for the CCP to expand participation may be found in the International Department of the CCP's analysis of Eastern European implosions and collapses.[15] This analysis concluded that these implosions were caused by:

- poorly developed economies, cut off from international markets and technologies;
- ruling parties that were divorced from their populaces—no grassroots level;
- collaboration between the Catholic Church and unions in the Polish case;
- external subversion by the United States and United Kingdom; and
- loss of control over security services which had overly repressive policies.[16]

According to Shambaugh, the Chinese also conducted in-depth analyses of the former Soviet Union, North Korea, Cuba, and Vietnam.[17] They attribute the demise of many authoritarian systems, such as those in Central Asia, to the influence of American nongovernmental organizations (NGO), concluding that they fomented revolution in these countries. The International Department of the CCP recognizes Singapore as a model worthy of close examination. The department admires how Singapore's ruling People's Action Party (PAP) has been able to remain low key but maintain total control. In Singapore, the ruling body never relinquishes power, but there exists the façade of a government that involves population participation, coupled with an open-market and prosperous economy.[18] It may be a model for "democracy with Chinese characteristics," but its track record on human rights and freedom is far more liberal than China's current model, and the gap between rich and poor is not so profound. It is clear that the Chinese are interested in learning lessons from other governmental systems and in finding replicable models for adaptation in China to support Hu's call for socialist democracy.

In the global political environment, Dr. Nancy Tucker, professor of history at Georgetown University's School of Foreign Service, sees China's increasing involvement in world institutions as a trend that will continue into the foreseeable future.[19] China's experience with regional organizations such as the Asian-Pacific Economic Cooperation (APEC) and the Association of Southeast Asian Nations (ASEAN) or on the global level at the United Nations (UN) and the UN Security Council is indicative of a strategy to influence regional and global issues. As China increases its engagement internationally, Dr. Tucker envisions an increase in conflicting pri-

orities with other nation-states, but China culturally would prefer not to have the top position in these organizations, but rather would prefer to be the "number two."[20] This is reinforced by a 3,000-year-old term that Deng Xiaoping brought back in guiding future Chinese leaders. It is *tao guang yang hui*, which translates to "hide brightness, nourish obscurity." Dr. Larry Wortzel, director of Asian Studies for the Heritage Foundation, explained the translation of Deng's meaning to congressional leaders as, "Put your brightness in your quiver behind your back, and then nourish your capabilities secretly."[21] Deng's intent was to bide time in bringing back China's prominence—create the impression of China's gradual awakening and opening, in essence a gradient of reform—a political strategy that is still intact today.

Deng, Jiang, and Hu: Gradual Reform

From 1978 to today, from Deng to Hu, China's strategic course has been additive, each leader's course building on the previous, each new evolution more ambitious. It reflects a gradient of incremental steps, beginning with the 24-Character Strategy set in motion by Deng.

The 24-Character Strategy refers to 24 Chinese characters:

"冷静观察，站稳脚跟，沉着应付，韬光养晦，善于守拙，绝不当头。"

"Observe calmly; secure our position; cope with affairs calmly; hide our capacities and bide our time; be good at maintaining a low profile; and never claim leadership."[22] It complements his call to hide brightness and nourish obscurity. Both ideas guide leaders to commit to the long-term outlook in charting China's course without invoking conflict among global actors.

Deng was responsible for the most significant deviation of the strategy to date: the massacre at Tiananmen Square. China came under the spotlight from the world community as well as the Chinese themselves who, to that point, had revered his leadership in the transition from Mao. *Xiaoping*, with different syllabic emphasis, translates in English as "small bottles." The protest, made globally visible by Mike Chinoy of CNN reporting from the square, involved thousands of Chinese smashing small bottles to the ground in solidarity with the victims—a practice which continued on college campuses for many anniversaries after the massacre.[23]

A major consequence of the massacre was altered political succession, with the reins of power being passed on to Jiang Zemin, mayor of Shanghai and party chief, rather than to the disgraced Zhao Ziyang, general secretary. Although Deng followed through by cracking down on the protests, he held the inner circle responsible for letting the situation get out of control. In a larger sense, the lesson from Tiananmen for Deng and those who came after him was

to articulate clearly to the populace not to confuse open markets with open (democratic) society.

President Jiang remained true to Deng's reforms and maxim "it is glorious to be rich" by introducing his vision called the Three Represents, which calls for advancement in economic and cultural development and political consensus. The drive to pursue national wealth aggressively continued while greatly increasing investment in the PLA and opening up very limited democratic opportunity at local levels to make the CCP attractive to more Chinese. Deng's vision was focused on the densely populated eastern coastal region. Although foreign investment soared, corruption and scandal followed, with the rural areas not benefiting as much from his strategy. The prosperity gap widened sharply. These were key challenges to be addressed when Pres. Hu Jintao took office in 2002.

Hu's "scientific development concept," also known as *Harmonious Society*, calls for economic prosperity as in Deng's and Jiang's visions. However, Hu seeks to control growth while focusing on the social issues that have grown since China's opening of its markets. His approach runs congruent with Confucian analects. Confucian philosophy emphasized personal and governmental morality, justice, and social correctness.[24] At the 17th CPC, Hu reiterated in his address that democratic opportunities would expand, wealth and prosperity would increase in the rural and western regions, the rule of law would be supported, environmental issues would be addressed, and corruption would be controlled.[25] History, philosophy, Deng's foundation, and the lessons learned at Tiananmen all serve as linkages for Hu and the new ruling elite to make these pronouncements about China's strategic direction.

What remains unchanged from Jiang's administration is defense spending, which increased in March 2007 by 17.8 percent, making it the largest defense budget China has ever had on a per capita basis.[26] Rather than face the "too little, too late" plight of its original opening to the West over a century ago, China is working to build a world-class military that will present its leaders with options not had since the Ming Dynasty. The gradient from Deng to Hu discernibly follows a definite trend or trajectory—a trajectory whose future path may be somewhat predictable.

What's Next for China?

China's trajectory is a steep curve. In exports, the key economic metric, China surpassed the United States in 2007, becoming the second largest exporter, and is forecast by the World Trade Organization (WTO) to pass Germany in the next few years.[27] China now ranks second behind the United States in oil consumption at seven million barrels per day.[28] The Congressional Research Service (CRS) references Global Insight's estimate that China's economy will overtake the US economy by 2013.[29] Global Insight predicts

that in 2025 the Chinese economy will be 59 percent larger than that of the United States.[30] Success in this area correlates with Chinese politics and the reform gradient established by Deng and expanded on by Jiang and Hu.

The senior director for East Asian affairs at the National Security Council, Dennis Wilder, plotted the trajectory and China's current position on the curve (see fig. 5).[31] Continuing on this trajectory to the "Rising China" quadrant entails meeting challenges that could knock China off this curve and move it in a different direction.[32] Internal discord, natural disasters, world recession/depression, or a crisis in Taiwan are examples of wildcard events that could alter the course. Chinese leaders are sure to have prepared contingency plans for the setbacks that can be foreseen, but unforeseen events will test them. Depending on which wildcard or combination thereof, the effect could be as benign as China's 2030 expectations taking many more years or as volatile as internal power disintegration or engagement in global conflict. In any case, to maintain its current Rising China trajectory, Chinese politicians will have to meet all of the challenges, wildcard or not. Moving into the Rising China quadrant by 2030 may yield more growth and freedom in China, but it does not necessarily mean that the United States and

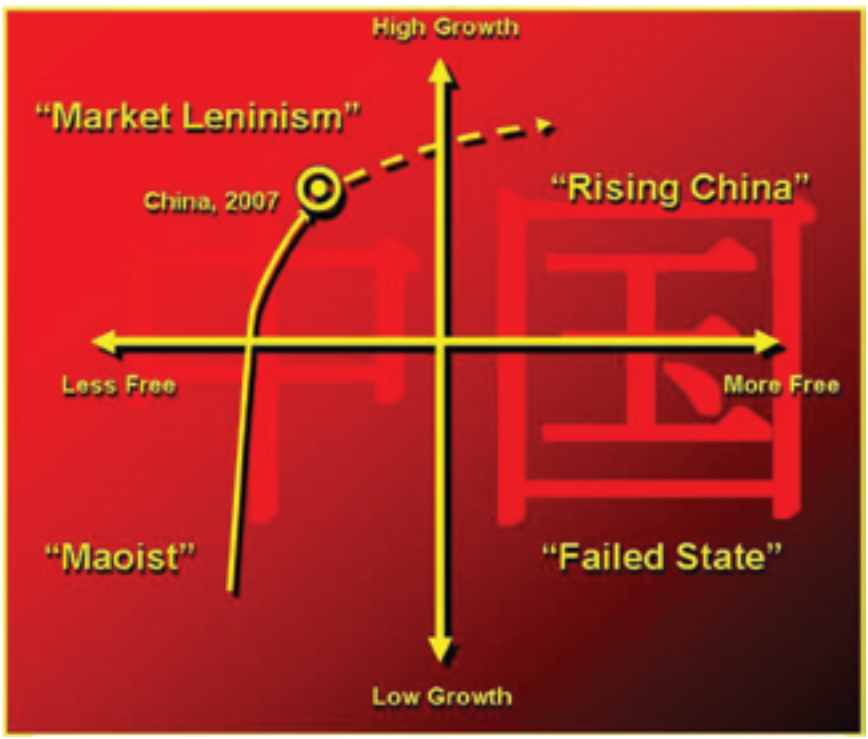

Figure 5. China's trajectory toward free-market democracy. (Chart created by author based on Dennis Wilder [senior director for East Asian Affairs, National Security Council, The White House], interview by author, 25 September 2007.)

other nations will not confront serious challenges in the Rising China environment in terms of commerce, defense, and global politics.

China's course also depends on the rising fifth generation of leaders continuing to advance Hu's harmonious society reforms. From the 17th CPC, the new selections to the Politburo Standing Committee include two potential successors to Hu in 2012. They are his protégés, Xi Jinping (Shanghai party chief) and Li Keqiang (Liaoning party chief).[33] Apart from successors, it is clear that many of the new fifth-generation leaders have risen under Hu's mentoring. The fifth generation is also called the "lost generation" because many did not have formal schooling opportunities during the Cultural Revolution; yet, most of those rising in the political ranks recaptured college educations and postgraduate degrees when China opened in 1978.[34] They meet another Hu criterion in selecting emerging leaders in that they are all in their late forties to early fifties—very young by Chinese standards. Age is a factor for top-tier leaders. The turnover rate for the Politburo Standing Committee, Politburo Central Committee, and the Central Military Commission will remain at 60 percent and higher, per Congress, for the foreseeable future.[35] Dr. Li Cheng of the Brookings Institution conducted an analysis of the 103 highest-ranking fifth-generation leaders. Common characteristics include the following:

- All had humble, hardship experiences during their formative years;
- A majority have postgraduate degrees (80 percent);
- Very few have technocratic governmental backgrounds (17 percent);[36]
- Many are lawyers with foreign study experience in social sciences; and
- Almost half are *tuanpai* (Communist Youth League) members (48.5 percent).[37]

Both potential successors, Xi and Li, were *tuanpai* members. Although Xi has emerged from the 17th CPC as the frontrunner, the performance of Xi and Li over the next five years will determine which will be selected at the 18th CPC as the new president. Dr. Li refers to this process as the new "inner-party democracy."[38] Promotion results from the 17th CPC make it clear that President Hu's influence and harmonious society or another parallel strategy will be China's path for at least the next two decades. The fifth generation of leaders from Hu's *tuanpai* students will form the leadership element in China for the foreseeable future.

The philosophy that these leaders will take forward is a broad form of the concept of harmonious society.[39] At the CPC, Hu took this harmonious society beyond the domestic and regional context in expanding the concept to "harmonious world" for the purpose of

shaping the world environment in which China will operate. Hu's overarching doctrine in foreign affairs is the 53-year-old *Five Principles of Peaceful Coexistence*, which was the initial framework to reach a peace accord with India following the Chinese occupation of Tibet.[40] Today the principles publicly stated to be China's universal approach to foreign relations are as follows:

- Mutual respect for each other's territorial integrity and sovereignty;
- Mutual nonaggression;
- Mutual noninterference with each other's internal affairs;
- Equality and mutual benefit; and
- Peaceful coexistence.[41]

Hu said, "We will pursue an independent foreign policy of peace and unswervingly follow the path of peaceful development and a win-win strategy of opening up. We will develop friendship and cooperation with all other countries on the basis of the *Five Principles of Peaceful Coexistence* and push for the building of a harmonious world of lasting peace and common prosperity."[42]

This platform is consistent with the current Chinese trajectory, the reforms of the past three generations of leaders, and Chinese culture. Taken at face value, the harmonious world concept is congruent with China's increasing interest in global institutions and politics. The principals of "peaceful coexistence" and "equality and mutual benefit" are welcome to the global community and tie to Deng's and Hu's strategies.

However, the unprecedented buildup of China's military and activism in forums like the UN Security Council or, most recently, the Six-Party Talks on North Korea and nuclear proliferation do not seem to correlate to the five principles, but these actions make sense culturally from Sun Tzu's writings and the pursuit of outcome through indirect means.[43] China is globally engaged today, and there are reasons to suspect that it is pursuing some of its national objectives via indirect means. Thus, as China continues on its current trajectory toward increased military and economic power, the expectation that it will be satisfied as a regional power or merely as a peer to the United States should not be depended on for planning.

The Road Ahead: Potential Disruptions to China's Current Path

What, then, is China's vector in a political sense for the future? The challenges on the horizon for China's leaders are complex and multifaceted. President Hu's and his successors' decisions in building harmonious society, and perhaps harmonious world, will influ-

ence how Chinese leadership structure, processes, and political systems will evolve, both domestically and internationally. External entities—not just foreign powers but also influential bodies such as multigovernmental organizations, NGOs, and multinational corporations (MNC)—will shape political activity and decisions and not always favorably to the party's power elite.

Chinese Leadership Structure and Processes

From the selections to the Politburo Standing Committee and other key posts filled during the 17th CPC, President Hu has consolidated a strong base. Hu not only selected his successors, he had a large hand in developing them as leaders through the *tuanpai* program as well. The top fifth-generation leaders, with Xi and Li leading the class, are the products of Hu's investment in the *tuanpai* many years ago. The likelihood that this generation will remain devoted to and build on harmonious society is strong.

However, Hu's remarks at the 17th CPC could become a source of potential instability. If, from these statements, there is a sincere initiative undertaken to allow a small number of regionally elected candidates to participate on national-level committees or at the CPC itself, it could be a very small reform that evolves in the coming decades into a major shift in the composition of top Chinese officials. Depending on the voice from nontraditional players in the government and how they are received or tolerated, the concepts of harmonious society could be revised in the decades that follow. Deng was not able to envision the resulting unrest and social dissidence resulting from market reforms and economic openness. Hu recognizes a need to allow for a measured amount of voice and participation among the population; however, doing so could result in outcomes that no one can foresee.

Domestic Politics

President Hu has discussed challenges, such as widening prosperity gaps, rule of law, and corruption mitigation openly at many public forums, including the 17th CPC. His government and those that follow will seek to champion these issues to keep domestic politics stable. The economy seems to be the clock they are working against. The rural areas have expectations of increased prosperity as envisioned in harmonious society, and the developed urban areas have expectations of more wealth. The current economic downturn, however, may threaten both.

In the first three months of 2009, China's growth rate has slipped to 6.1 percent.[44] Despite this decrease in growth and the concomitant dislocation of nearly 20 million workers, all indications are that unless the economy turns sharply worse, China will likely manage to muddle through.[45] Should the economy enter a sharper

downturn or the global crisis deepen into a depression, some level of disenfranchisement is to be expected. Further, during this period of relative economic stagnation, China will be more vulnerable to the effects of major natural disasters, pandemics, and environmental crises. Any of these, on top of the extant economic challenges, may alter the ruling elite's ability to stay the course.

International Politics

China is reinvesting a large part of its wealth into global influence, making international politics a priority. Its access in Africa now includes 44 of the continent's 53 states. The rationale for this may be driven by the need for resources, but the by-product from investing in African infrastructure, regardless of any ideological chasms, is improved global influence. Its efforts in establishing groups like the Shanghai Cooperation Organization (SCO) or participating in preexisting bodies such as the UN, APEC, or ASEAN will continue to be vehicles of choice for China to exert itself globally.

The United States is not the only variable for which China's politicians must plan. In addition to instability in Africa—a problem with which most imperial powers have contended at one time or another—Russia, India, and Japan are neighbors that fit more into the competitor rather than partner category. Historically, China had regrettable experiences with all these countries, and its leaders will likely remain suspicious in any bilateral or multilateral effort.

The Chinese ideals of *Five Principles of Peaceful Coexistence* would be tested if China decides Taiwan must be taken back with force or if it decides to garner natural resources by blocking other nations' access in areas such as the contested Spratly Islands. These are potential sources of conflict Chinese leaders will seek to avoid if they are to realize their global goals; however, short-term crises could evolve in ways that force the Chinese to temporarily abandon long-term strategy.

External Entities

An outgrowth of globalization and China's prosperity is the tremendous rise of per capita wealth and, therefore, the influence of external entities contributing to this success. To make their operating environments more stable and conducive to greater corporate success, multinational corporations have invested in social corporate responsibility (SCR) programs, boosting local communities' infrastructure, education, and environments in much the same way NGOs target their programs. NGOs operate similarly for their own objectives, but whether SCR or NGO money is being invested, the long-term effects are influences Chinese leaders will be cautious of due to the history of the "bad century." As stated, the Chinese conclusion was that the Central Asian states fell due to subtle influences from the NGOs. Future leaders in China will be cautious

as these efforts flourish but may find it impossible to reverse those that meet with widespread approval among the populace.

Guiding the harmonious society to 2030 will not be easy for Chinese leaders. The planning variable that will likely remain constant is that the ranking elite of the Communist Party will be in power well beyond the 2030 time frame. No other constants exist. They should be preparing today for how the Chinese political system will adjust to an environment that is certain to be dynamic and volatile. Instead of a smooth trajectory to the Rising China quadrant, these factors could alter the path to something more closely resembling figure 6.

Policy Implications

There is a wide range of thought from experts focused on studying China. However, given reform progress and economic trends experienced by China since Deng Xiaoping, there is broad consensus that at a minimum, China will rise to peer status in the international political system over the next 20 years.[46] Knowledge of Chinese culture, its history of foreign relations, and its rapid rise

Figure 6. One potential Chinese trajectory toward 2030. (Chart created by author based on Dennis Wilder [senior director for East Asian Affairs, National Security Council, The White House], interview by author, 25 September 2007.)

through the Deng, Jiang, and Hu eras is essential in designing a vision from which policies can be crafted. China's political power is centralized, but the political elite's activities traverse every element of Chinese society, whether diplomatic, informational, military, economic, or cultural. Early Chinese philosophy, still in practice today, espouses indirect action, meeting goals in quiet ways, and creating contradictions to confuse or deceive as methods in achieving objectives. In the political arena, US policy makers should consider the following strategies.

Invest in Regional Alliances and Access

Chinese leaders may seek to weaken US influence in Asia, and globally, by eroding the strength of our partnerships. Therefore, we need to increase resources to enable our country teams to increase investment in relationships with traditional regional allies in addition to making inroads with countries where we have not had robust relations. US relations with India, Nepal, Myanmar, Bangladesh, Laos, Cambodia, and Vietnam must improve between now and 2030. The United States would do well to strengthen its role and the roles of its allies in APEC and ASEAN. US engagement must be constructive and adaptive with regard to the wide range of cultural diversity perspectives in the region. It is also important to increase efforts in monitoring how China conducts diplomacy with the same actors, watching for opportunities that may arise.

Increase US-China Bilateral Opportunities

Before China ascends to peer status, the United States should pursue actions to partner with the Chinese wherever mutual interests converge. The Six-Party Talks on North Korea are an ongoing example of constructive collaboration with the Chinese. Shaping the opinions of the fifth generation of leaders and beyond will be important as China passes critical growth milestones.

China's major investments in Africa represent an opportunity for collaboration. Space programs may represent another area where relations could be enhanced or deepened. Shambaugh recommends a "Track II" approach, promoting unofficial contacts among nongovernmental actors aimed at advancing diplomatic efforts to enhance the policy dialogue between nations.[47] He also advocates for a reorganized China effort in the executive branch at the National Security Council and State Department to ensure China policy is not contradictory with other efforts in the region.[48]

Provide More Options through Military Investment

China's politicians are investing aggressively in disruptive technologies that have the potential to give it an asymmetric advantage if left unmatched. The space and cyber domains will become vul-

nerabilities in the near term, given recent demonstrations of an antisatellite (ASAT) and cyber-attack capability. The United States needs to pursue leadership in developing directed energy, nano, and robotic weapons and the countering technologies for our forces that may face them. Covert weapons programs should also be pursued to ensure the United States maintains its military advantage. This strategy strengthens US credibility with regional alliances and commitments and ensures decision makers' options are never limited, should conflict with China manifest itself. America should increase its engagement with China and regional partners and cultivate an understanding of China's culture and history but should always retain the capability to approach the relationship from a position of strength and leadership. Given that China's current and follow-on generations of political leaders are established and that Chinese policy with regard to these investments is unlikely to change, the United States must match the developmental timelines with acquiring the right weaponry.

Conclusions

China and its political leaders have been managing change at a voracious pace since Deng Xiaoping led the nation on its new course of economic growth and openness. Chinese leaders' inclinations to promote economic liberalization while retaining authoritarian control do not seem sustainable in the years ahead when accounting for information proliferation; a rising, expectant, middle class; and an increasing need for resources. Perhaps the political leadership's best acknowledgement of this can be found in the 17th CPC statements by President Hu. He openly embraces democracy with tractable plans to open up the government, targets the rule of law and corruption as areas for action, and commits to focus on rural areas to halt the growing income disparity. This alone establishes direction for the Chinese government that can be anticipated and for which the United States should plan.

US policy makers must weigh Chinese history, culture, and experience before assessing its intent with regard to regional or global politics. The United States has insufficient power to halt China's rise, nor should it necessarily seek to do so, but a comprehensive plan on how to pursue the US-Sino relationship must be designed, resourced, and executed with the China of 2030 in mind. The current leaders, ever mindful of China's history with foreigners and a perspective aligned with Confucius and Sun Tzu, have defined their path, and so we must now define our own.

Notes

1. Hu Jintao, "Scientific Outlook Development" (lecture, Yale University, New Haven, CT, 24 April 2006). Hu's definition is found in these quotes: "China will

pursue a scientific outlook on development that makes economic and social development people-oriented, comprehensive, balanced and sustainable. We will work to strike a proper balance between urban and rural development, development among regions, economic and social development, development of man and nature, and domestic development and opening wider to the *outside world*. It is also rooted in the *cultural heritages* of the Chinese nation."

2. Arthur Waley, trans. and ed., *Analects of Confucius* (New York, NY: Vintage Books, 1989). Because of the teachings of Confucius, the population will generally defer to the authorities unless the legitimacy of the regime is called into question. To call this legitimacy into question requires rulers to show that they are manifestly unjust or demonstrate that they cannot paternally lead the society. Should the government fail to lead justly or fail in its ability to lead its people, then the mandate of heaven is lost, and it becomes not only the right but also the duty of every Confucian to oppose the incumbent administration. The central government's actions in these matters are in keeping with this cultural backdrop. Addressing issues of corruption and the environment are in keeping with just rule.

3. Ibid.

4. International Monetary Fund (IMF), "World Economic Outlook Update: An Update of the Key WEO Projections," http://www.imf.org/external/pubs/ft/weo/2009/update/01/pdf/0109.pdf, January 2009 (accessed 6 April 2009). Even in the midst of the current economic downturn, China's gross domestic product is still growing at an impressive rate. In January 2009 the IMF projections suggested that despite the global recession, China's economy would still grow by 6.7 percent in 2009 and by 8.0 percent in 2010.

5. The "Bad Century" is the roughly 100-year period between the colonial victories in the Opium Wars and the beginnings of the Communist revolution in the 1940s. China still regards this period of being subjugated to the rule of the rest of the world as a period of humiliation. The contrast of this period with a prosperous "harmonious society" resonates within the Chinese people.

6. Note that the Confucian mandate of heaven remains intact should a government survive a rebellion. Deng Xiaoping's actions in this situation are consistent with the cultural underpinnings of Chinese government.

7. Deng Xiaoping, "Build Socialism with Chinese Characteristics" (speech, Sino-Japanese Relations Conference, Beijing, 30 June 1984).

8. Carlos Pascual, "What Should We Expect of the 17th Party Congress?" *Changes in China's Political Landscape: The 17th Party Congress and Beyond Symposium* (Washington, DC: Brookings Institution, John L. Thornton China Center, 12 April 2007), 6.

9. Ibid., 27, 35.

10. Joseph Kahn, "Politburo Reshuffle Is a Sign for China," *International Herald Tribune Asia-Pacific*, 22 October 2007.

11. In fact, three days after the close of the 17th Communist Party Congress, press reports circulated suggesting Jiang Mianheng had been arrested. For details, see BBC, "CCP's Highest Hierarchy Possesses Tape of Jiang Mianheng Leaking Secrets to Zhou Zhengyi," *BBC Monitoring Asia Pacific*, 24 October 2007, http://www.hkhkhk.com/engpro/messages/2346.html. These reports appear to have been exaggerated, and Jiang Mianheng remains a vice-president of the Chinese National Academy of Sciences. Nonetheless, his nonselection to the Politburo Standing Committee, as some had believed likely, suggests that Hu Jintao has sufficiently consolidated his grip on power that it can be said that he is truly in charge of the Chinese governmental apparatus.

12. Hu Jintao, *Hold High the Great Banner of Socialism with Chinese Characteristics and Strive for New Victories in Building a Moderately Prosperous Society in All*, Report to the Seventeenth National Congress of the Communist Party of China, Beijing, 15 October 2007, http://www.china.org.cn/english/congress/229611.htm.

13. Ibid.

14. Ibid.

15. Dr. David Shambaugh, "Chinese Discourse about Democracy," *Changes in China's Political Landscape* (Washington, DC: Brookings Institution, John L. Thornton China Center, 12 April 2007), 177–83.

16. Ibid. In each case, the Chinese conclusion is that the ruling body failed to take either direct or indirect action to counter the threat, whether that meant expanding economic opportunity, allowing limited democratic voices to counter subversion, or holding tight control on security services and their policies toward the populace.

17. Ibid.

18. Ibid., 183–84.

19. Dr. Nancy B. Tucker (professor, School of Foreign Service, Georgetown University, Washington DC), interview by author, 26 September 2007.

20. Ibid.

21. House, *China's Strategic Intentions and Goals: Hearings before the Committee on Armed Services*, 106th Cong., 2d sess., 2000, 13.

22. *Annual Report to Congress from the Office of the Secretary of Defense, Military Power of the People's Republic of China, 2007* (Washington, DC: Office of the Secretary of Defense, 2007), 6.

23. Mike Chinoy, *China Live, Two Decades in the Heart of the Dragon* (Atlanta, GA: Turner Publishing, 1997), 306.

24. John Pomfret, *Chinese Lessons: Five Classmates and the Story of the New China* (New York, NY: Henry Holt Publishing, 2006), 128.

25. Hu, *Hold High the Great Banner*.

26. *Annual Report to Congress*, 25.

27. China Development Gateway, "WTO: China Outpaces U.S. in Exports," *China Daily*, www.chinadaily.com.cn/chinagate/doc/2007-04/16/content_851758.htm, 16 April 2007. While the *China Daily* predicts China will pass Germany in 2008, the World Trade Organization's (WTO) 2008 report strongly suggests this didn't happen, as exports and imports in the European Union grew at nearly the same pace as China's. Nonetheless, the long-term trends still suggest China will pass Germany in the near future. WTO, *International Trade Statistics 2008* (Geneva, Switzerland: WTO, 2008).

28. Energy Bulletin, "A New Kind of Energy for China," www.energybulletin.net /22997.html, 27 November 2006.

29. Congressional Research Service (CRS), *Is China a Threat to the U.S. Economy?* (Washington, DC: CRS, 23 January 2007), 15. However, this prediction is among the earliest crossing points the authors could find. A survey of several other sources, including interviews with various brokerage houses as well as projections by the World Bank and the IMF, yielded a median projection of the crossing point between the Chinese and US economies in the early 2020s. Regardless, it appears China's economy will almost certainly pass the US economy in size within the next 20 years.

30. Ibid.

31. Dennis Wilder (senior director for East Asian Affairs, National Security Council, The White House, Washington, DC), interview by author, 25 September 2007.

32. Ibid.

33. Jayshree Bajoria, "Unveiling China's Political Future," *Council on Foreign Relations*, 22 October 2007, http://www.cfr.org/publication/14477/deciding_chinas _political_future.html.

34. Pascual, "What Should We Expect of the 17th Party Congress?" 15–21.

35. Ibid., 14.

36. Ibid. This attribute differs from the third and fourth generations, who are predominantly technocrats.

37. Ibid., 17. Hu was the head of this organization during their membership.

38. Ibid., 21.

39. Hu, *Hold High the Great Banner*.

40. Dr. Nancy B. Tucker, ed., *China Confidential* (West Sussex, NY: Columbia University Press, 2001), 225–26, 519.

41. Ibid.

42. Xinhua, "Hu Jintao, Top CPC Leaders Meet the Press," *China Daily*, 22 October 2007, http://www.chinadaily.com.cn/china/2007-10/22/content_6196354.htm.

43. Ralph Sawyer, *The Tao of Deception: Unorthodox Warfare in Historic and Modern China* (New York, NY: Basic Books, 2007), 323–31, 354–55.

44. Keith Bradsher, "China's Economic Growth Slows in First Quarter," *New York Times*, 16 April 2009, http://www.nytimes.com/2009/04/16/business/global/16yuan.html?hpw (accessed 16 April 2009). As this paper goes to press, recent estimates for second-quarter growth in China are hovering around 7.9 percent. See Joe McDonald, "China's Economic Growth Accelerates amid Stimulus," *Jakarta Post*, 19 August 2009, http://www.thejakartapost.com/news/2009/07/16/china039s-economic-growth-accelerates-amid-stimulus.html (accessed 19 August 2009). McDonald reports for the Associated Press, Beijing Office.

45. Christer Ljungwall, *Perspectives on Economic Growth and Stability in China* (Stockholm, Sweden: Swedish Institute for International Affairs, 2009).

46. Statement drawn from multiple interviews of a cross-section of China subject-matter experts, including senior representatives from the political, military, diplomatic, academic, corporate, nongovernmental organization, and think tank areas, Washington, DC, and Singapore City, Singapore, 20–27 September 2007 and 6–7 October 2007.

47. Dr. David Shambaugh, "Facing Reality in China Policy," *Foreign Affairs* 80, no. 1 (Winter 2001): 60–62.

48. Ibid., 63.

Chapter 4

The Peaceful Development Road

China's Economic Program

Col Edwin F. Donaldson

This chapter focuses on how Chinese grand strategic policies and decisions have influenced the macroeconomic features of the Chinese economy and how events have impacted the international economic community. The first section is a historical analysis of China's post–Mao Zedong macroeconomic policies; the second examines China's economic resurgence seen today; and the third identifies challenges that China must overcome to attain its economic goal of moving from a developing to a developed nation, eventually challenging the United States economically as a global peer.

Post-Mao Reform

The death of Mao allowed political ideology policies centered on class struggles and mass movements to give way to pragmatism and empirical experimentation as the foundation for economic reform.[1] After a brief political struggle, Deng Xiaoping surfaced as China's new leader with a clear vision to lead China's economic reform. Deng's policies were adopted by the Third Plenum of the 11th Party Central Committee in December 1978, thus beginning China's serious economic reform.[2]

New Course for Economic Growth

Under Deng Xiaoping, the CCP sought to reverse the economic direction set by Mao and correct the problems resulting from his policies.[3] According to Deng, "the problems consisted of low income and poor living standards, deficient incentives to labor and management, low quality of industrial products, inefficiency in resource distribution, declining productivity in both agriculture and industry, disproportionate rates between investment and consumption, and imbalances between heavy industry, agriculture and light industry."[4] Deng Xiaoping's reform policies addressed agriculture, industry, the pace of economic growth, and economic structural change, as the leadership chose to open China's economy to the world.[5] This open-door policy became the single greatest contributor to the post-Mao economic transformation of the Chinese economy.

Rural-Agriculture Reform

The poor agricultural output condition in the 1970s resulted from the Maoist policies that sanctioned investment inequalities and removal of market incentives, which slowed agricultural growth to an anemic 1.8 percent per year.[6] Mao's commune system reduced and destroyed any incentives for peasants to increase their farming production.[7]

Conversely, Deng's policy reforms sought to decentralize the agricultural decision making down to the production teams who were given control of the regulation of labor, funds, materials, and goals, as well as decisions on production methods and income distribution.[8] Free markets were introduced to provide market incentives, which provided additional income incentives for individual efforts outside and beyond the farming commune.[9] The results were spectacular, as annual agricultural output increased in value by an average of 6.4 percent per year from 1981 to 1990.[10]

Urban-Industrial Reform

The early economic policies of Mao led to a very imbalanced economy, emphasizing heavy industry at the expense of agriculture and light industry. The imbalances led to scarcity in consumer goods and low growth rates in other sectors.[11]

The Central Committee sought to introduce market forces while still maintaining a socialist culture. It believed that if the bulk of the economy was guided by planned production and was state or collectively owned, it would maintain its socialist nature, and a degree of private ownership would be compatible.[12] The committee transferred responsibility to enterprises and their managers and provided incentives to retain profits and receive bonuses.[13] The reform experiments began with six industrial enterprises in 1978,[14] and by 1981 that number had grown to 30,000.[15] Similar to the agricultural reforms, the industrial reforms gave rise to some unanticipated problems to include excessive capital investment, inflation, and a shortage of skilled manpower.

The most serious of all the new problems was corruption.[16] "Industrial reform has greatly increased the opportunities for corruption amongst low-level government officials, and many have interpreted the government's encouragement to get rich quick as a license to use their official positions and connections to do so."[17] The corruption problem led to a CCP ruling barring officials of the party and government from opening a business or forming partnerships.[18] The party realized that economic reform was not the root cause of the corruption, but the mixture of market mechanisms, individual profit-making opportunities, and dependence on bureaucratic decisions, shortages, and official allocations formed a fertile breeding ground for corruption.[19]

Open-Door Policy

The open-door policy was adopted as post-Mao economic reformists realized that foreign technology and investment were needed to fuel market-driven economic reforms.[20] The policy is the antithesis of the Maoist culture of self-reliance, which stressed the use of domestic resources for development and rejected the adaptation of foreign methods of development.[21]

A new constitution and the creation of special economic zones (SEZ) were two changes necessary to implement the open-door policy. In 1982, under the control of Deng Xiaoping, a new constitution was passed making foreign investments legal and creating SEZs to facilitate foreign investment and technology transfer.[22] Initially there were four SEZs: Shenzhen, Zhulai, Shantou (Guangdong Province), and Xiamen (Fujian Provence).[23] The SEZs enabled foreign investment, promoted competition within regions, and acted as experimental areas to test policy and economic reform measures in order to learn the rules of the market system.[24] Deng later characterized the SEZs as "windows" for new technology, knowledge, management expertise, and openness.[25]

The operation of an SEZ was outside of established state oversight procedures, and the SEZ was allowed to implement incentive policies:[26] "The local governments in the SEZs are allowed to provide preferential policies to attract foreign investors and to undertake their own infrastructure development and other investment as long as they can raise funds. The policies included lower tax rates; tax holidays lasting several years and exemption of import licenses and customs duties on imports of machinery as well as their export."[27]

Many Westerners have viewed the economic reforms as China's attempt to democratize; however, these reforms should be viewed as China preserving socialism while benefiting from the implementation of capitalist economic reform.[28] The SEZ establishment was a very deliberate experiment controlled by the CCP to cautiously introduce aspects of a free market into China's form of communism. A considerable amount of China's growth over the past 20 years can be attributed to this cautious experiment of opening the economic door.

Current Economic Indicators and Causes for Growth

For the past 30 years, China has experienced unprecedented growth resulting from the macroeconomic policy decisions beginning in 1978. During the last three decades, China has been ranked as the world's third largest economy based on GDP by both the IMF and the World Bank, behind the United States and Japan. The Central Intelligence Agency's *World Fact Book 2007* ranked China as the second largest economy in 2006, based on purchasing power parity (PPP). The *Economist Intelligence Unit* reported China's real GDP growth for 2007 as 11.5 percent. Equally impressive are China's exports, which have increased more than 650 percent over the past nine years (see fig. 7).[29]

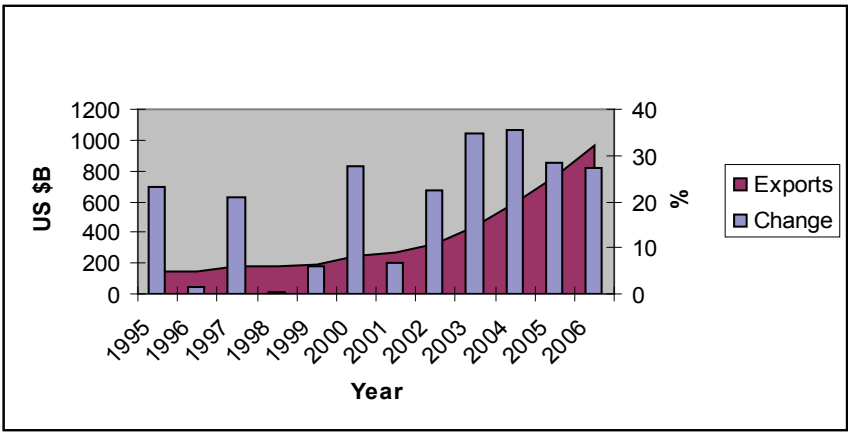

Figure 7. **China's trade with the world**. (Adapted from US-China Business Council, "China's Customs Statistics," and PRC [People's Republic of China] General Administration of Customs.)

Factors Underlying China's Growth

The early policy decision to invest heavily in the industrial sector set the stage for China's growth and greatly influenced the factors contributing to its sustained economic performance. Capital, labor, total factor productivity (TFP), and employment demographics are some of the causes behind the growth.[30] The following analyses on China's growth, while similar, offer some concerns regarding the effects of China's continued growth that need to be considered in examining its continued economic development.

Kujis and Wang identify sources and patterns of economic growth; they argue that the growth of investment in the industrial sector is the primary factor behind China's GDP and labor productivity growth.[31] Their study considers the relationship among capital, labor, and TFP and their respective contributions to the GDP increase between 1978 and 2004.[32] Specifically the study compares and contrasts the 1978–1993 and the 1993–2004 periods, using the Cobb-Douglass production function to support their findings.[33]

Between 1978 and 1993, labor productivity rose by 7 percent on average each year, and employment grew by 2.5 percent per annum. Slightly more than half of the increase in labor productivity stemmed from TFP growth, and the rest came from the rise in the capital labor ratio (see fig. 8).[34] During 1993–2004, when investment as a share of GDP increased significantly, labor productivity rose by 7.8 percent per year on average, whereas employment growth declined to just over 1 percent a year. In this period, the contribution of TFP growth to labor productivity growth declined, and the contribution of capital intensity rose to two-thirds.[35] These results underscore the increased importance of capital accumulation over the last decade.[36]

	1987–93	1993–2004
GDP growth	9.7	9.0
Employment growth	2.5	1.1
Urban employment growth	5.2	2.9
Labor productivity growth	7.0	7.8
From TFP growth	3.7	2.7
From increasing K/L ratio	3.2	5.1
Memorandum item (in percent)		
Investment/GDP ratio	30.2	36.8
At end-period		
Share of employment in agriculture	56.4	46.9

Figure 8. Sources and aspects of China's growth, 1978–2004. (Reprinted from Louis Kujis and Wang Tao, "China's Pattern of Growth: Moving to Sustainability and Reducing Inequality," *China and World Economy* 14, no. 1 [14 February 2006]: 14.)

Kujis and Wang also highlight the important role labor shifts between agriculture and industry have played in the sustained economic growth. In developing countries with large surplus labor pools available in low-productivity agriculture, rapid economic growth and industrialization result in a shift to the nonagricultural sector.[37] This economic edict holds true as the labor migration from agriculture to primarily industry and services was evident until the mid-1990s,when the service sector overtook the industry sector (see fig. 9).[38]

Kujis and Wang point out the flattening of the industry sector migration since the mid-1990s and show a migration tradeoff from the service sector. The employment share trend indicates a leveling of economic sector migration.

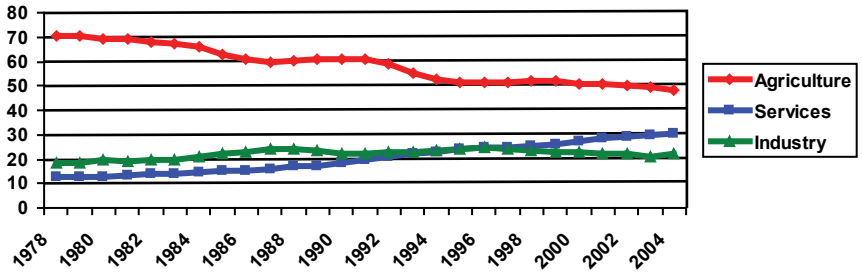

Figure 9. China's percent of workforce employed by sector. (Reprinted from Louis Kujis and Wang Tao, "China's Pattern of Growth: Moving to Sustainability and Reducing Inequality," *China and World Economy* 14, no. 1 [14 February 2006]: 14.)

The market factors' contribution to China's continued GDP growth can be seen by studying each sector's contribution to the percentage of value to the GDP. Figure 10 depicts the percentage of value added by economic sector between 1978 and 2002, as measured by the World Bank. Although we see a continued increase in the industry sector's contribution to percentage of value added to GDP (see fig. 10), this growth comes at a time when the employment share of industry remained fairly constant. The Kujis and Wang study highlighted this fact and attributed the explosive growth since the early 1990s to labor productivity growth rather than to employment growth, mainly due to large-scale labor investments and increased capital-to-labor ratio.[39]

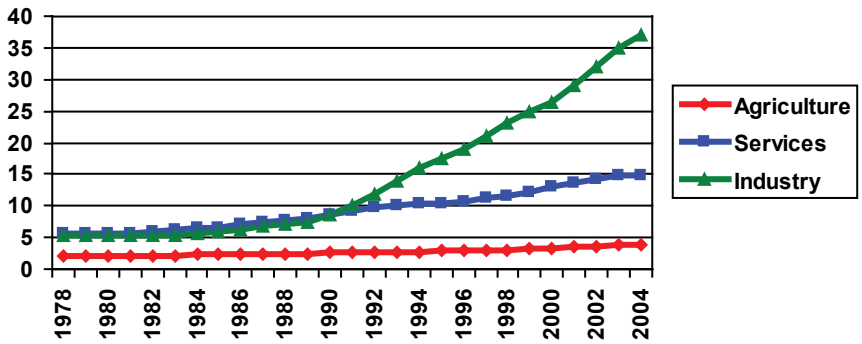

Figure 10. China's percentage of value added to GDP by sector. (Reprinted from Louis Kujis and Wang Tao, "China's Pattern of Growth: Moving to Sustainability and Reducing Inequality," *China and World Economy* 14, no. 1 [14 February 2006]: 14.)

In 2002 Cai Fang and Wang Meiyan published a second study analyzing China's economic growth in *China and World Economy*.[40] They argue first that China's enormous economic growth over the past few decades is real and will continue. They support that argument by comparing the percentage of economic growth over time of the last four developing economies and then by identifying and supporting five factors of previous growth that will continue to support future growth. Fang and Meiyan show that it took England 58 years to double its per capita GDP, the United States 47 years, Japan 34 years, and Korea 11 years, while China only took nine years to double its per capita GDP the first time between 1978 and 1987.[41] They also identify five factors supporting China's economic growth: 1) an increase of physical capital; 2) an increase in labor force employment; 3) an accumulation of human capital; 4) an acceleration in labor mobility from low- to high-productivity sectors; and 5) an increase in total factor productivity.[42]

A comparison of the two studies reveals increases in physical capital, labor mobility from low to high productivity, and total factor productivity as common factors. Not only have investments in physical capital been a major contributor to China's GDP growth,

Fang and Meiyan argue this will continue to be a source of growth in the future. Additionally, they suggest that China's prosperity may not be as dependent on foreign investment as many think based on the percentage of investment funding (see fig. 11).[43]

Additionally Fang and Meiyan suggest that the migration from the low-productivity sector into the high-productivity sector will continue to grow, and as the labor market matures through efficiencies, the rural-to-urban migration will intensify. Also, as the institutional barriers between the central, eastern, and western regions decay, simplifying migration, the economy will benefit from the resource flexibility of China's labor.[44]

Finally, continued future economic growth can be found by improving TFP efficiencies. Currently TFP only makes minor contributions to GDP. The needed technological efficiencies to increase TFP will be realized by the expansion of the nonstate sectors and competition between state-owned enterprises.[45]

The previous two studies have identified three common factors responsible for China's past and continued economic growth, which included capital investment, labor, and TFP. As the studies show, the removal of institutional barriers prohibiting labor migrations, the continued expansion of the nonstate sector, and continued state-owned enterprise competition are all necessary for China's continued economic growth. Not only is it important to understand the factors that will contribute to the rebalancing measures necessary to ensure sustained economic growth, it is also equally important to know and understand the economic policy that will guide China's future growth.

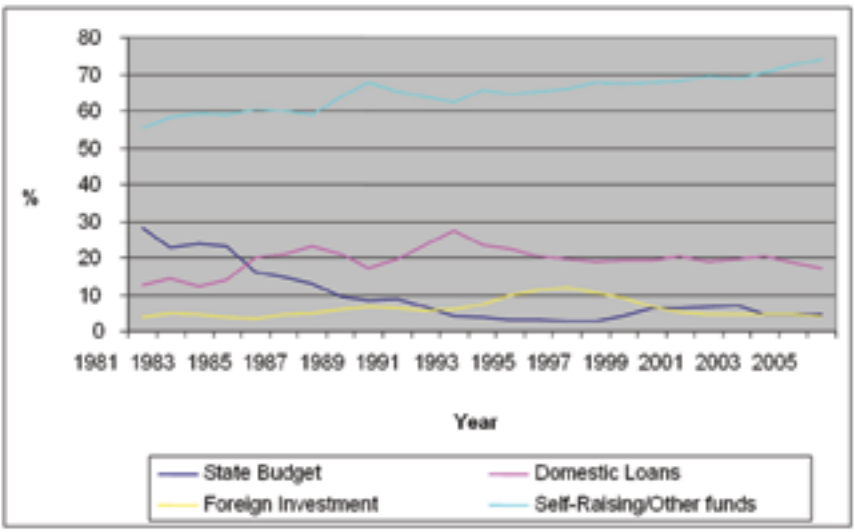

Figure 11. China's percentages of total investment in fixed assets. (Reprinted from National Bureau of Statistics of China, *China Statistical Yearbook—2006* [Beijing: China Statistics Press, September 2006], http://www.stats.gov.cn//tjsj/ndsj/2006/indexch.html.)

The Peaceful Development Road

The Peaceful Development Road outlines China's goals of a continued rise to power and internal development while pursuing these goals peacefully.[46] Specifically, the plan is built upon the Five Principles of Peaceful Coexistence:

1. Peaceful development is the inevitable way for China's modernization;
2. Promoting world peace and development with China's own growth;
3. Developing by relying on its own strength, reform, and innovation;
4. Seeking mutual benefit and common development with other countries; and
5. Building a harmonious world of sustained peace and common prosperity.[47]

In stating the need for peaceful development and calling for global cooperation, China realizes that an avoidance of open conflict is necessary to maintain its economic growth. In an attempt to quell the anxieties of the United States and its regional partners, China continuously reinforces its claim not to seek hegemony, either now or in the future, and wants other states to believe its development will never pose a threat to anyone. Instead, China wishes to be seen as bringing development opportunities and bigger markets to the rest of the world.[48] Through its peaceful development pledge, China aims to put the United States and the rest of the world at ease while it continues to pursue aggressive economic gains. The Five Principles of Peaceful Coexistence will likely act as a backdrop to China's economic growth over the next two decades.

Peaceful Development is the Inevitable Way for China's Modernization

Under the peaceful cloth of its latest policy, China is attempting to achieve the necessary growth as outlined in the fifth plenary session of the 16th Central Committee, which adopted China's latest five-year plan covering the period 2006–10. The goals of the plan are to double the 2000 per-capita GDP of $854 by 2010 through structure optimization,[49] increase economic returns, enhance resource utilization and, by 2010, reduce the 2005 per-unit GDP resource consumption by 20 percent.[50] Although the stated goals are ambitious, China recognizes that it can best achieve them with peaceful relations with other global powers.[51]

China has achieved enviable growth since the major economic reforms began in 1979 and realizes the challenges that lie ahead can best be achieved in a peaceful international environment.

Among its challenges are a large population, a weak economic foundation, and an unbalanced development. China's population demographics will present considerable challenges that must be overcome to sustain economic growth (see fig. 12).[52]

United Nations Population Projection, 1998 Revision, Medium Variant (million)					
	1950	1995	2010	2025	2050
Total	556.7	1,226.7	1,380.5	1,488.1	1,484.4
0 - 4	76.2	103.7	92.7	86.3	78.1
5 - 19	165.0	319.6	290.4	278.1	245.6
20 - 49	228.4	594.7	665.0	597.9	529.7
50 +	87.1	208.8	332.4	525.8	631.0

Figure12. China's population by age group, 1950–2050. (Reprinted from *World Population Prospects: The 1998 Edition*, New York, CR-ROM.)

Promoting World Peace and Development with China's Own Growth

China's second principle of peaceful coexistence is the need to promote a peaceful international community to maintain its developmental goals. At the same time, China's continued growth helps maintain a peaceful international community. China's State Council white paper highlights how its development in energy conservation and poverty reduction directly contributed to global development and international cooperation. For example, China cites that its energy consumption per unit of GDP has dropped by 45 percent since 1990, and the state has a goal of maintaining an energy savings rate of 3 percent per year through 2020.[53] Additionally, China's efforts to increase standards of living have lifted 220 million of its citizens out of poverty.[54] Thus, China seeks to be seen as a more responsible member of the international community by creating mutually benefiting relationships with other developing nations while maintaining a friendly relationship with its neighbors.

China recognizes its role as a developing regional power and is beginning to act as such on the international stage. It carries out this role by maintaining continued economic growth, increasing its trade with other countries, and actively participating in regional disaster relief efforts. For example, World Bank statistics credit China's internal economic growth for 13 percent of the world economic growth from 2000 to 2004.[55] China recognizes that it must continue to increase its consumer consumption levels and increase production capacity to grow its export revenues. China views this as a necessity for its own development and, at the same

time, realizes that it benefits the international community. In 2004 China's import and export figure doubled that of the three previous years, reaching $1.155 trillion; its import figure nearly doubled that of the three previous years, reaching $561.4 billion.[56]

China has grown considerably since the 1949 revolution, but as a developing country, it recognizes there is still much to be done in terms of continued growth, reducing the number of people still living in poverty, and reducing the disparity between coastal regions and the rest of China. Currently China has 26.1 million people living below poverty level; the World Bank ranks China as a lower-middle-income country. Continuing to lift the rural poor out of poverty remains a key goal of President Hu's administration.

Estimates of China's per capita GDP vary, however, as the local currency, the renminbi, is subject to artificial governmental exchange rate controls. On the low end, the Chinese government reports that its per capita GDP is approaching $3,000.[57] On the other end of the scale, the IMF puts China's current GDP, using PPP as a measure, at approximately $4,116 per person based on a total country output estimated for 2009 at $6.786 trillion divided by the 1.3 billion total population.[58] Even at existing exchange rates, the per capita GDP had crossed the $3,000 threshold as of early 2009.[59]

Developing by Relying on Its Own Strength, Reform, and Innovation

Although China remains committed to its open-door policy, it is determined to rely on itself to ensure continued growth. China expects to maintain this growth by increasing domestic demand, focusing on information technology (IT) to promote industrialization, becoming a country of innovation by promoting scientific and technological progress, building a resource-saving and environmentally friendly society, and fulfilling the promises made when admitted into the WTO.[60]

China has committed to incorporating IT into its industrialization reform efforts. Specifically, China plans to focus on its advanced manufacturing industry, high- and new-tech industries emphasizing IT and biological industries, and increasing the size of the service sector.[61] Additionally, through scientific and technological progress and the development of medium- and long-term plans, China seeks to increase its innovation.[62] To this end, China is moving toward increasing its scientific and technological research from 1.44 percent of GDP in 2004 to 2.5 percent in 2020.[63]

Guided by the third principle of peaceful coexistence, China is committed to creating an environmentally friendly, resource-saving nation and at the same time fulfilling its WTO obligations. China realizes that to maintain its continued growth, it must secure reliable energy sources. It currently meets 90 percent of its energy requirements through domestic resources, primarily coal.[64] As

China continues to grow, it will require more energy and will call for the international community to implement policies that facilitate energy availability for all.[65] For its part, China is seeking ways to conserve energy and become environmentally responsible.

The Chinese see their economic development benefiting the outside world as much as themselves and, therefore, believe it paramount that they fulfill their WTO admittance requirements. To become a responsible partner, China believes it is making strides in meeting WTO promises in the following areas:

1. Constantly improving the management system and policies concerning foreign businesses in China and creating a fair and predictable legal environment;
2. Improving the environment for investment and trade by opening its markets;
3. Improving the trade structure and enhancing freedom and convenience; and
4. Encouraging Chinese enterprises to invest overseas.[66]

The WTO recognized and gave China credit for the incredible amount of progress made to date in terms of economic reform. Its report cited continued trade liberalization along with declining tariff and export restrictions as examples of reform.[67]

In addition, the report cited legal reforms resulting in a 9 percent growth rate for almost 20 years, causing China to become the world's third largest trader and one of the largest recipients of foreign direct investment (FDI).[68] China considers these positive steps its commitment to peaceful development of the world. However, in light of these positive measures, the WTO had some concerns.

The WTO is still concerned about issues such as the growing income inequalities, the artificial exchange rate regime, import-restricting policies, indirect measures used to guide investments, and the lack of enforcement of intellectual property rights. The WTO is also concerned with a need to relax ownership and entry requirements and strengthen regulation in services. However, in light of these concerns, China is encouraged to remain committed to its economic reform policies and increase transparency. As China continues to rely on itself for successful economic reform, it realizes that it must be an active member of the global community.

Seeking Mutual Benefit and Common Development with Other Countries

The strength of China's future success lies in its implementation of the fourth principle of peaceful development. As China seeks mutual benefit and development with other countries, it secures its integration and guaranteed access to resources. For example,

China has become the world's third largest importer as imports have grown 16 percent a year since 1978.[69]

In 2004 China's direct investment in external markets amounted to $44.8 billion, spread among 149 regions and countries, with Asia receiving 75 percent of that amount.[70] China imported $500 billion of commodities per year from December 2001 through September 2005. China projects to exceed $1 trillion (US) by 2010, and this figure likely will grow in the future.[71] As we see the impact of mutual benefit and common development, a growing China still seeks to achieve its goals harmoniously.

Building a Harmonious World of Sustained Peace and Common Prosperity

The final principle speaks to the end state China seeks to help build for mankind. China articulates its desired end state as a harmonious world that is democratic, just, and tolerant.[72] However, the success of this principle lies in China's cultural and leadership characteristics, a full discussion of which lies outside the scope of this chapter. However, as Holt mentioned, democracy may mean a much more constrained view of public participation than is commonly held in the West. Thus, while China may be seeking a "harmonious" society, its definitions of democracy, justice, and tolerance may be as focused on how the world views China as they are on how China interacts with the world.

China's Growing Economy

To assess whether China will challenge the United States as a near peer by 2030, it is vital to understand what China's economy will look like in the future and what economic rebalancing China may have to conduct to achieve its projected growth. This section draws upon a series of economic indicator projections looking toward the 2030 time frame and discusses the policy rebalances that will be necessary.

The first projections are offered by Robert Lawrence Kuhn in his *China Economic Review* article titled "What Will China Look Like in 2035?" The article cites research accomplished at the official Chinese government think tank, the Institute of Quantitative and Technical Economics of the Chinese Academy of Social Sciences (CASS).[73] Prof. Wang Tongsan states that the forecasts assume a slowing of China's growth but warns that similar trends proved incorrect in the past.[74] The article cites the forecaster's projections, made in the 1960s, stating that the GDP would double between 1960 and 2000. However, time has revealed a much different picture; the GDP has increased almost 17 times in real growth terms.[75] It is important to begin with how the Chinese view themselves. This next section will provide the Chinese perspective and illustrate their forecasts for the 2030 time frame.

China's economic environment in 2030–35 is projected to include the following characteristics:

- GDP: Growing to $5.9 trillion in 2030 and $6.7 trillion in 2035.
- GDP per capita: Rising from $4,000 in 2030 to $4,500 in 2035.
- Service sector's percentage of contribution to GDP: Expanding from 40 percent in 2005 to 48–49 percent in 2030–35 time frame (Wang projects 55–60 percent).
- Income inequality: Moderating steadily from current inequality of .46 today as measured in Gini coefficient.
- Energy efficiency: Increasing fourfold, according to CASS researchers, based on technology advances.
- Oil imports: Going from 150 to 260 million tons today to 350 million tons by 2035.
- World-class companies: Expanding from 22 companies in the world's top 500 to 30 or 40 in the areas of telecommunications, petrochemicals, electric power, banking, autos, electronics, and computing.
- Automobiles: Escalating from 8.8 million to 46.7 million by 2030 and 53.4 million in 2035.[76]

Although these forecasts are highly conservative—in fact they posit virtually no growth in per capita income across the next three decades—it is important to understand how the Chinese view their own future economic growth potential because it will influence their decision matrix and risk-mitigation decisions. China's own internal economic view will impact how China acts in the military and political domains. As such, an understanding of China's own internal forecasts is important.

The Congressional Research Service (CRS) has examined China's future economic prospects in the July 2006 *China's Economic Conditions*. This report measures China's economic outlook through 2020 and its implications for the United States and identifies major long-term challenges that lie ahead. Unlike the Chinese, independent research firms are predicting much stronger economic growth between now and 2020. For instance, the economic firm Global Insight predicts average real GDP growth at 7.8 percent for the next 10 years, which means China could double the size of its economy before 2018.[77] The CRS report also cites the Economic Intelligence Unit's claim that China will become the world's largest exporter by 2010 and the world's largest economy by 2020.[78] To develop effective and comprehensive near-, mid-, and long-term strategies, it is useful to understand the implications of the forecasts that look to 2030 and beyond.

Although it is difficult to find useful and credible long-term forecasts, Goldman Sachs has issued two. In its first report, *Dreaming with BRICs: The Path to 2050*, Wilson and Purushathaman used capital accumulation and productivity growth models to forecast the GDP growth, income per capita, and currency movements for the economies of Brazil, Russia, India, and China (BRIC). According to the Goldman Sachs study, the following projections are provided for China's economic condition through 2050:

- China's economy could overtake Japan by 2015 and the United States by 2039–41;
- China's investment rate will gradually decline from its current levels of around 36 percent to 30 percent;
- China's GDP growth rate will fall to 5 percent in 2020;
- By the mid-2040s, GDP growth will slow to around 3.5 percent;
- China's currency could double in value in 10 years if growth continues and the exchange rate is allowed to float freely;[79] and
- China's per capita income in 2030 would be equivalent roughly to what South Korea's is today ($20,000).

In 2006 Goldman Sachs updated this study. In *BRICs and Beyond*, the brokerage house argues that while Chinese investments may stay high, the demographic trends caused by the one-child policy may stifle economic development. The report contains predictions for China in 2030 ranging from a low of $11,000 per capita GDP ($16 trillion total) to as much as $22,000 per capita (GDP of $32 trillion). Given that this report estimates the United States per capita GDP at $61,000, it implies that at any level above the low end of the forecast range China's economy would pass that of the United States before 2030.[80]

To visually depict how the 2050 market forecasts for the United States and China look, three forecast projections were plotted (see fig. 13). The red line, which is near the mean of the Goldman Sachs projections, is viewed by the authors as a most likely case, with China surpassing the United States in GDP in the mid 2020s. By 2030 China will almost certainly be the largest economic power on the planet. Even in the direst scenarios for China, it achieves parity or near parity with the United States in this time frame.[81] The top line is based on the 2009 official projection from the economists at the IMF.[82] In recent years, these economists have been uncannily accurate. If this trend continues, China's economy would follow the magenta line, dwarfing the United States economically by a factor of more than two by the 2030 time frame.[83]

It is important to validate the credibility of the forecast to ensure the projections of China's sustained economic growth are not dismissed. The Goldman Sachs study defends its claims through recent

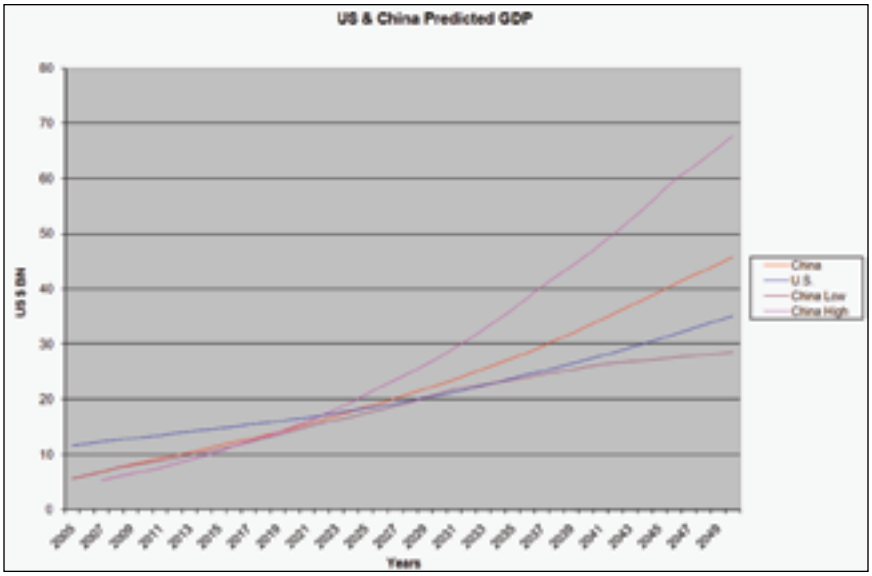

Figure 13. US and China projected GDP. (Chart created by author based on Dennis Trewin and Shaidi Badiee, *2005 International Comparison Program, Preliminary Results* [New York, NY: World Bank, 17 December 2007]).

examples of developing countries' GDP growth and cites a second set of 30-year real GDP growth numbers from another methodology for comparison purposes. To make the incredible future growth potential of China's economy possible, Goldman Sachs offers Japan's and Korea's recent economic growth for a means of perspective: "The study offers the following statistics documenting Japan's growth between 1955 and 1995. In Japan, between 1955 and 1985, real GDP increased nearly 8 times and real industrial production increased tenfold. Between 1975 and 1995, the yen appreciated 300 percent in normal terms against the US dollar. Also, Korea's GDP in between 1970 and 2000 increased nearly 9 times."[84]

The study also justifies its claims by applying an entirely different model to forecast real GDP growth numbers. The study took the Levine-Renelt Model and generated real GDP growth projections and compared those against their original numbers (see fig. 14).

Comparing Our Projections With the Levine-Renelt Model		
30 year average real GDP growth	Our Projections	Levine-Renelt Model
Brazil	3.7	3.3
Russia	3.9	3.5
India	5.8	5.3
China	5.6	5.8

Figure 14. Goldman Sachs's growth projections (the authors' projections), compared with the Levine-Renelt Model. (Adapted from Goldman Sachs, *BRICs and Beyond*, Goldman Sachs report [New York, NY: Goldman Sachs, February 2006].)

One can reasonably assume that around 2030 China will have economically surpassed the United States as the world's economic superpower. Despite the enormous potential energy for China's sustained economic growth, there are some obstacles that can slow down or derail China's economic rise.

Bumps in the Peaceful Development Road

The momentum China has gained through its economic reforms seems strong enough to ensure China's status as an economic superpower in the next two decades. However, some events could slow China's economic growth. Among those are a Taiwan conflict, human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), a pandemic influenza, increased business or governmental corruption, a failure to protect intellectual property rights, and China's aging population. Two issues that offer the greatest potential to derail China's continued growth are energy scarcity and an inability to control corruption.[85] There is a possibility that both could occur simultaneously, resulting in greater instability than either would generate alone.

Energy Scarcity

In spite of enthusiasm to make alternate fuel sources "mainstream," the reality is that fossil fuels will still reign supreme for at least the next decade and probably through 2030. The *World Energy Outlook (WEO) Report 2007* states that fossil fuels remain the dominant source of primary energy, accounting for 84 percent of the overall increase in demand between 2005 and 2030 (see fig. 15). The other consideration that must be made when projecting into the future is the impact the rise of India will have in the region. Although an analysis of India is not in the scope of this report, India's continued rapid growth will place significant resource demands upon the global system.

China's projected growth can only be attained by an increase in energy consumption. The IEA states that the world's energy needs will be over 50 percent higher in 2030 than today, with China and India accounting for 45 percent of the increase. Experts believe China will increase its energy consumption by about 150 percent.[86] Under the third principle of development which calls for relying on itself, as the demand for oil increases, it can be expected that China will use its vast coal deposits to meet its rising energy demands. However, as stated in the WEO report, 90 percent of China's coal lies within the interior, and the biggest increase for demand is expected to occur in the coastal regions. The WEO report also points out that this will stress the coal transport system, making imports of coal to the coastal regions more competitive. The WEO report projects that cumulative investment in China's energy-supply

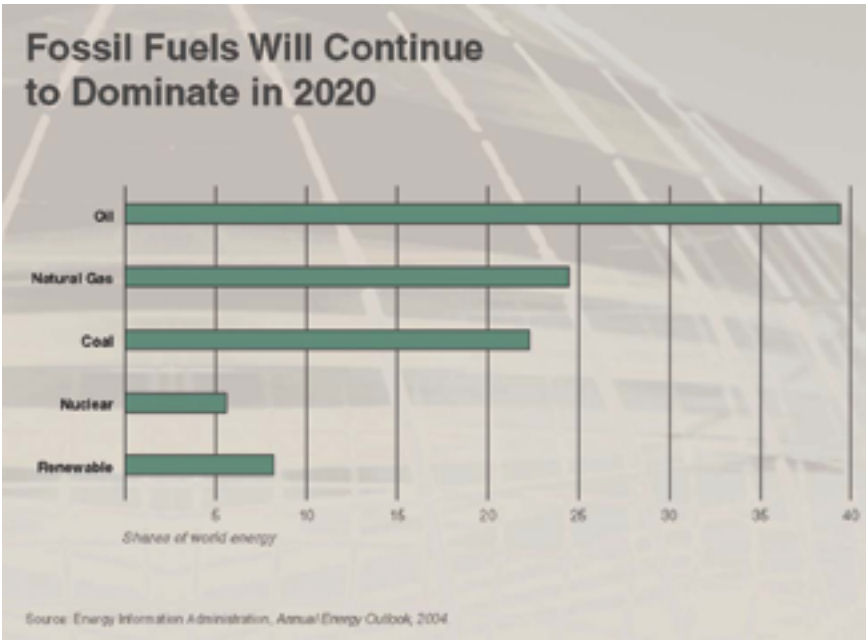

Figure 15. Energy source projections for 2020. (Chart created by author based on the International Energy Agency [IEA], *WEO Report 2007: China and India Insights* [Paris: IEA, 2007].)

infrastructure will total $3.7 trillion (in year 2006 dollars) from 2006 to 2030.

Finally, energy availability creates a huge challenge for the Chinese government between now and 2030. China needs to ensure a reliable and affordable source of energy to maintain growth. China's demand for energy to fuel its economic growth will greatly stress an already unstable market, much sourced through the Middle East, jeopardizing global energy security. To maintain economic growth, China will need to stay on the road for peaceful development in order to influence the world stage and meet the needs of its population.

Corruption

Corruption is not a uniquely Chinese phenomenon; rather, it is a human endeavor present in all levels of society. Corruption is very difficult to measure, but quantifying it is required in an attempt to identify forces that could negatively affect the continued growth of China's economy. Chinese scholars are beginning to suggest what was once heretical: that the country suffers from "systemic corruption."[87]

In 2002 an annual report on Chinese society, published by the CASS, gave warning that "unless the problem of corruption is gen-

uinely tackled as a systemic issue, it could become the main cause of social turmoil." The same report stated that 67.3 percent of respondents to a 2001 survey believed that political reform was urgently required.[88] To further quantify the level and characteristic of the Chinese corruption policy, the following quote from Carnegie Endowment for International Peace senior associate Minxin Pei shows the severity of the problem: "Corruption poses one of the most lethal threats to China's future economic development and political stability. Illicit activities such as bribery, kickbacks, theft, and misspending of public funds cost at least 3 percent of GDP."[89]

Transparency International's (TI) groundbreaking work has provided the forum to bring the corruption discussion to the forefront of international organizations. TI has been assessing the Corruption Perception Index (CPI) since 1995 and has consistently rated China's as no higher than 3.5 for the last 12 years (see fig. 16).[90] China's corruption problem has been validated from numerous sources both internal and external to China.

On the surface, one might be inclined to identify a single heavily state-governed party and nontransparent society as the causes of corruption. However, upon closer examination, these traits would be better identified as enablers rather than causes. Three related but distinct causes rise to the top. Endemic corruption in China originates from the country's partially reformed economy, lax enforcement efforts by the government, and the CCP's reluctance to adopt substantive political reforms.[91]

The Carnegie report highlights that the central government's direct control and influence with no checks or balances feed the corruption machine. Today, the state sector accounts for more than 35 percent of the GDP; controls the nation's largest corporations;

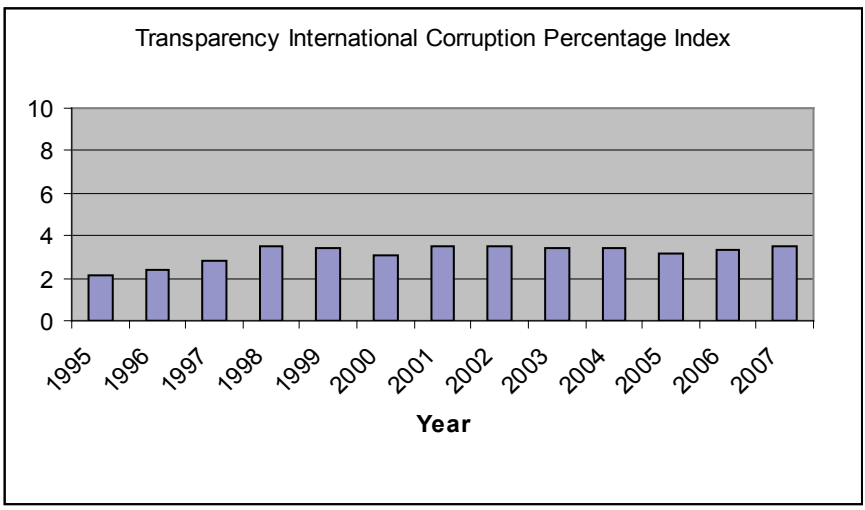

Figure 16. China's Corruption Percentage Index. (Chart created by author based on Transparency International, http://www.transparency.org).

monopolizes key industries such as banking, power generation, and natural resources; owns trillions of dollars in fixed assets; and makes hundreds of billions of dollars in new investments each year. In addition, the state controls key prices (most importantly the interest rate and land prices) and tightly regulates certain economic activities (real estate development and infrastructure).[92]

In a system with corruption as pervasive as China's, it is difficult to maintain good governance and effective rule of law. For example, many of the party officials' families are involved to some degree. The other problem impeding enforcement is corruption's enduring presence as a "way of life," making it difficult to break the chain. According to the TI Web site,

> Despite severe punishment against officials in high-profile cases, official enforcement data indicate that Beijing punishes only a very small proportion of party members and government officials tainted by corruption. For example, nearly 80 percent of the 130,000–190,000 CCP members disciplined and punished by the CCP annually since 1982 got at most a warning. Only 20 percent were expelled from the party. Less than 6 percent were criminally prosecuted. In recent years, half of those convicted of corruption received suspended sentences and served no jail time. Therefore, the odds of an average corrupt official going to jail are at most 3 out of 100, making corruption a high-return, low-risk activity.[93]

The impact of China's corruption can be measured directly by the cost of corruption against the GDP and indirectly by the people's eventual lack of confidence in government and its cancerous effect on the fabric of societal effectiveness. The TI Web site shows that "based on the conservative assumption that 10 percent of the land lease revenues, fixed investments, and government spending is stolen or misused, the *direct* costs of corruption in 2003 could be 3 percent of GDP, roughly $86 billion, an amount exceeding the government's entire spending on education in 2006."[94]

One indirect consequence of corruption deals with the effectiveness of government. As a result of China's economic reform decisions and principle of self-reliance, China has sown the seeds for potential discontent. First, through its effective use of the SEZs, China created a very wealthy, influential middle class who expect a functioning government to ensure its standard of living. Second, to carry out the principle of mutual benefit and common development to ensure the continued introduction of FDI, the government must demonstrate the effective rule of law to provide investors with confidence. Investors also require stability in the economic framework.

Another indirect consequence of corruption is its ability to infiltrate and weaken all functions of society. For example, "endemic corruption steadily increases a country's *systemic risks*. As a result, its financial system is fragile, its environment degraded and vulnerable, its law enforcement establishment tainted and ineffective, its infrastructure insecure, its public health system irresponsive, and its regulatory system creaky."[95]

Corruption, recognized both internally and externally as a problem, has been suggested as the most lethal threat to the continued success of China's economic growth. China has consistently received a very poor CPI from TI. While the direct cost today may be only 3 percent of the GDP, if the CCP doesn't get corruption under control, it may undermine the environment for the investment market, creating indirect costs to its economy far greater than the $86 billion estimated above.

Conclusion

The watershed event for China's economic transition was the Third Plenum of the 11th Party Central Committee in December 1978. Under Deng Xiaoping's leadership, China evolved through a five-stage economic reform plan beginning with rural agriculture reform and ending with the open-door policy. The catalyst for opening up China to the world was the need for foreign technology and investment capital. It was during this period that a constitution was signed and SEZs were created. The CCP would experiment with deliberate, controlled execution within these SEZs. After each initiative ran its course, its effectiveness, or lack thereof, was evaluated and lessons applied to the next evolution of reform. The result was a hybrid market-socialism set of practices that are the foundations and microcosms of a society implementing a new capitalistic reform policy. Aware of its potential destabilizing force, China seeks for its development to benefit the rest of the world as well. For China to succeed and transition from a developing to a developed country, there are some challenges that it must overcome.

Potential factors that can derail China's economic reforms exist. The longer the status quo remains, the more likely there will be a peaceful reunification, much like the Hong Kong model. It is very likely that China's gravitational attraction to its regional neighbors will influence the current balance of power. The issues of energy scarcity and uncontrolled corruption will be the two most important forces with which China must contend. The international community does have a mutual interest in China's success; however, it is a double-edged sword that threatens to redistribute the power equation balance. If China cannot assure access to resources peacefully—through the effective rule of law—and minimize the impact of corruption, its economic growth will decline, and with it, its Mandate of Heaven could be lost. As seen in earlier times, that could lead to a collapse from within.

Notes

1. Kuotsai Tom Liou, *Managing Economic Reforms in Post-Mao China* (Westport, CT: Praeger, 1998), 29.
2. Ibid.

3. As Col Blaine Holt points out in chapter 3 of this paper, Deng Xiaoping recognized that while foreign influences had often harmed China, especially during the "Bad Century," the lack of market openness was costing China economic growth. This political realization led to the economic policy changes being discussed here.

4. Liou, *Managing Economic Reforms*, 29.

5. Ibid., 30.

6. Kung-Chia Yeh, ed., "Economic Reform: An Overview," in *China's Economic Reform* (San Francisco, CA: The 1990 Institute, 1993), 19. This growth rate was well below the growth rate of the population, resulting in the people becoming gradually poorer in terms of available food stuffs.

7. Hui Wang, *The Gradual Revolution: China's Economic Reform Movement* (New Brunswick, NJ: Transaction Publishers, 1994), 67–69.

8. Ma Hong, *New Strategy for China's Economy* (Beijing: New World Press, 1983), 50; and Carl Riskin, *China's Political Economy: The Quest for Development since 1949* (Oxford: Oxford University Press, 1987).

9. Liou, *Managing Economic Reforms*, 32. In addition, the government sought to increase standards of living by raising the grain quota deliveries by 20 percent, and prices for deliveries above quota were raised 50 percent. See Karsten Grummitt, *China Economic Handbook* (London: Euromonitor Publications, 1986), 65.

10. Robert F. Ash, "The Agricultural Sector in China: Performance and Policy Dilemmas during the 1990s," *China Quarterly* 131 (September 1992), 545–76.

11. Dennis Woodward, "China's Industrial Reform Policy," *Australian Journal of Chinese Affairs* 14 (1985), 85–104.

12. Ibid., 91.

13. Ibid., 89.

14. Robert M. Field, "Changes in Chinese Industry since 1978," *China Quarterly* 100 (December 1984), 745.

15. Robert Delfs, "The Five-Year (Non) Plan—Blueprint for the Future," *Far Eastern Economic Review* 126, no. 50 (13 December 1984): 72.

16. Woodward, "China's Industrial Reform Policy," 85–104.

17. Mary Lee, "Corruption: The Dark Side of the Liberalism Coin," *Far Eastern Economic Review*, 21 March 1985; and Woodward, "China's Industrial Reform Policy," 98.

18. Woodward, "China's Industrial Reform Policy," 98.

19. Ibid.

20. Liou, *Managing Economic Reforms*, 41.

21. Ibid. The rationale for this decision was also explained in chapter 3.

22. James T. H. Tsao, *China's Development Strategies and Foreign Trade* (Lexington, MA: Lexington Books, 1987).

23. Liou, *Managing Economic Reforms*, 43.

24. Ibid.

25. Chung-Tong Wu, "China's Special Economic Zones: Five Years after an Introduction," *Asian Journal of Public Administration* 7, no. 2 (1985): 134.

26. Liou, *Managing Economic Reforms*, 43.

27. Ibid.

28. James Kun Kai-sing, "The Origins and Performance of China's Special Economic Zones," *Asian Journal of Public Administration* 7, no. 2 (December 1985): 201.

29. US–China Business Council, "China's Customs Statistics," PRC [People's Republic of China] General Administration of Customs.

30. Louis Kujis and Tao Wang, "China's Pattern of Growth: Moving to Sustainability and Reducing Inequality," *China and World Economy* 14, no. 1 (February 2006): 1, 14.

31. Ibid.

32. Total factor productivity (TFP) is a measure of those production increases that are not caused by increases in inputs (labor, materials, investment, etc.). For example, in the agricultural industries, weather can be a TFP variable, as good weather can cause increased crop yields, with no change in economic inputs such as farm equipment, number of seeds planted, or number of laborers.

33. The Cobb-Douglass function is a commonly used econometric tool for describing the relationship between output and labor input and capital input (capital investment). The most common form of the equation, written in matrix form, is: where Y is defined as total output, X2 is defined as labor input, X3 is defined as capital input, e is the base of the natural logarithm, and *u* is a stochastic disturbance term. The subscripts i represent time. β2 is the partial elasticity of output with respect to the labor input and is a one by i matrix. Likewise, β3 is the partial elasticity of output with respect to capital input holding the labor input constant. For more on the Cobb-Douglass economic models, see Damodar N. Gujarati, *Basic Econometrics* (Boston, MA: McGraw-Hill, 2003), 222–26. Slightly more advanced treatments can be found in Knut Sydsaeter and Peter J. Hammond, *Mathematics for Economic Analysis* (Singapore: Pearson Education, 1994), chap. 15; and William H. Greene, *Econometric Analysis* (Upper Saddle River, NJ: Prentice-Hall, 2000), 269, 283, 327–29, and 637.

34. Kujis and Wang, "China's Pattern of Growth," figure is table 1.

35. Paul Heytens and Harm Zebregs, "How Fast Can China Grow?" in *China: Competing in the Global Economy*, eds. Wanda Tseng and Markus Rodlauer (Washington, DC: International Monetary Fund [IMF], 2003). They assume varying TFP growth throughout the reform period and find some, but relatively modest, variation.

36. Kujis and Wang, "China's Pattern of Growth," 14.

37. W. Arthur Lewis, "Economic Development with Unlimited Supplies of Labor," *Manchester School of Economic and Social Studies* 22, no. 2 (1954): 19.

38. Kujis and Wang, "China's Pattern of Growth," 14.

39. Ibid.

40. Cai Fang and Wang Meiyan, "How Fast and How Far Can China's GDP Grow?" *China and World Economy* 5, no. 7 (2002).

41. Ibid.

42. Ibid.

43. National Bureau of Statistics of China, "China Statistical Yearbook–2006," http://www.stats.gov.cn/english/ (accessed 27 January 2009).

44. Fang and Meiyan, "How Fast and How Far Can China's GDP Grow?"

45. Ibid.

46. The Peaceful Development Road should be thought of as a subset of Hu Jintao's Harmonious Society. It is, in essence, the economic piece of what Holt discusses in chapter 3.

47. State Council Information Office of China, *China's Peaceful Development Road*, US–China Business Council White Paper, 3 June 2008, http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN023152.pdf, 1 (accessed 7 February 2009).

48. Ibid., 1.

49. This per capita gross domestic product (GDP) figure is obtained from Dominic Wilson and Roopa Purushathaman, *Dreaming with BRICs: The Path to 2050*, Global Economics Paper no. 99 (New York, NY: Goldman Sachs, 1 October 2003). Figures are measured in 2003 US dollars. As will be seen, this figure is a conservative measure of GDP.

50. State Council Information Office of China, *China's Peaceful Development Road*, 1.

51. Ibid. Indeed, since this plan was first drafted, all evidence is that China's GDP is advancing far faster than was planned. In fact, the Chinese News Agency announced the Chinese GDP exceeded $3,000 per person for the first time in late 2008. See Xinhua News Agency, "Chinese per Capita GDP Crosses 3000 USD Threshold," *Chinese Newswrap*, 7 March 2009, http://chinanewswrap.com/2009/03/07/chinese-per-capita-gdp-crosses-3000-usd-threshold (accessed 12 July 2009).

52. *World Population Prospects: The 1998 Edition*, CD-ROM. These estimates and projections include the population of mainland China and Hong Kong.

53. State Council Information Office of China, *China's Peaceful Development Road*, 4.

54. Ibid.

55. Ibid.

56. Ibid.

57. "Expert: China's per Capita GDP to Hit $3,000 by 2010," *China View*, http://news.xinhuanet.com/english/2008-01/04/content_734497.htm (accessed 5 March 2008). It should be noted, as Holt and Caine stated, that China is deliberately trying to conceal some of its development. Thus, discovering that the lowest estimates of current Chinese GDP emanate from China itself is not surprising. It is worth noting that the Xinhua News Agency on 3 March 2009 reported Chinese per capita GDP above the $3,000 threshold as of the end of 2008.

58. IMF, "World Economic Outlook Database," http://www.imf.org/external/pubs/ft/weo/2009/01/weodata/weoselgr.aspx (accessed 28 April 2009). These numbers have been adjusted for the current recession.

59. Ibid. China's per capita GDP as of April 2009 in US dollars is $3,622 per person per year.

60. State Council Information Office of China, *China's Peaceful Development Road*, 5–6.

61. Ibid., 6.

62. Ibid.

63. Ibid.

64. Ibid.

65. Ibid.

66. Ibid., 7.

67. World Trade Organization (WTO), *Annual Report 2007*, WTO Publications 132 (Geneva, Switzerland: WTO, 2007), 70.

68. Ibid.

69. State Council Information Office of China, *China's Peaceful Development Road*.

70. Ibid.

71. Ibid.

72. Ibid.

73. As Holt mentions, the Chinese strategy articulated by Deng Xiaoping and adhered to since is to "hide our capacities and bide our time." As such, the estimates that emanate from China tend to be very conservative projections. The reader should note this in comparing Chinese projections to those from other sources. The long-term projections here are well below those being made by the World Bank, the IMF, or brokerage houses like Goldman Sachs.

74. R. L. Kuhn, "What Will China Look Like in 2035?" *China Economic Review* 3 (2008).

75. Ibid.

76. Ibid.

77. "China: Interim Forecast Analysis: Economic Growth," *Global Insight*, December 2005.

78. Wayne M. Morrison, *China's Economic Conditions*, Congressional Research Service (CRS) Report for Congress (Washington, DC: CRS, 11 December 2009).

79. Wilson and Purushathaman, *Dreaming with BRICs*, http://www2.goldmansachs.com/ideas/brics/brics-dream.html (accessed 27 January 2009).

80. With the US population estimated to be around 350 million, its GDP in this time frame would be approximately $21.35 trillion. See *BRICs and Beyond* (New York, NY: Goldman Sachs, 2006), http://www2.goldmansachs.com/ideas/brics/BRICs-and-Beyond.html (accessed 5 March 2008). The Chinese economy in 2006 and 2007 grew at a rate more than 3 percent faster each year than Goldman Sachs upper estimate. This places China at already more than 6 percent above the report's upper forecast boundary.

81. Dennis Trewin and Shaidi Badiee, *2005 International Comparison Program, Preliminary Results* (New York, NY: World Bank, 17 December 2007).

82. IMF, "World Economic Outlook Databases," April 2009. The IMF revised its PPP calculations in 2008. The projections are based on IMF-estimated growth percentages based on its starting value in 2009 for China's GDP in PPP.

83. Jianwu He and Louis Kujis, "Rebalancing China's Economy—Modeling a Policy Package," World Bank China Research Paper no. 7 (New York, NY: World Bank, September 2007).

84. Wilson and Purushathaman, *Dreaming with BRICs*.

85. *BRICs and Beyond*, Goldman Sachs report. While the aging population issue will gradually slow China's growth, it is not expected to stop it.

86. National Intelligence Council (NIC), *Mapping the Global Future*, NIC Report no. 123 (Pittsburgh, PA: NIC, 2004), 62.

87. John Pomfret, "Systemic Corruption: Something Rotten in the State of China," *Economist*, 14 February 2002.

88. Ibid.

89. Minxin Pei, *Corruption Threatens China's Future*, Policy Brief 55 (Washington, DC: Carnegie Endowment for International Peace, 17 October 2007).

90. Transparency International (TI) Web site, http://www.transparency.org (accessed 24 January 2008). TI is a global network including more than 90 locally established national chapters and chapters in formation. The Corruption Perception Index (CPI) ranks 180 countries by their perceived levels of corruption. A country's or territory's CPI score indicates the degree of public-sector corruption as perceived by business people and country analysts and ranges between 10 (highly clean) and 0 (highly corrupt).

91. Ibid., 4.

92. Ibid.

93. Ibid.

94. Ibid.

95. Ibid., 6.

Chapter 5

China's Military Modernization

Lt Col Ralph A. Sandfry, PhD

Since Deng Xiaoping began opening China to the world in 1978, China has experienced an economic revolution that fueled a tremendous rise in national power. Due to its rapid economic growth, China has become more globally connected and integrated. This rising economic interdependence suggests that the potential for military conflict with China should be diminished.

Nevertheless, during recent years China has undertaken a prolonged military buildup and modernization program. China is improving antiaccess capabilities including maritime forces, air defense, and its ballistic and cruise missiles. Also, China is focusing considerable attention on disruptive technologies in areas such as cyberspace, counterspace, and the directed-energy weapons (DEW) fields. China's neighbors and the United States have raised concerns regarding this buildup and question the possible motives for these trends in an environment where international threats to China are diminishing. While some of the new military capability may be attributed to a potential Taiwan conflict, China's military long-term goals may reach much further.

As China's power rises and its national interests expand, it will seek to maintain its own "freedom of action" in controlling threats to Chinese sovereignty and its economic lines of communication. China's long-term military aims support its vision as a regional power. With a ring of influence in the western Pacific, China's military will have sufficient power to prevent outside efforts to intervene in its "internal" affairs. Taiwan will remain the most likely near-term source of a China-US conflict, but the probability of conflict over Taiwan may well diminish in the long term with the potential for peaceful accommodation or even reconciliation. However, as China's interests expand globally, protecting lines of commerce and access to natural resources may also prompt China to flex its newly developed military powers.

If current economic trends continue, Chinese national power may rival or even exceed that of the United States by 2030. The lack of Chinese transparency makes it difficult to precisely assess its current strength and ascertain future intentions. However, it is plausible that current economic trends will enable military growth to continue at a remarkable pace and that, at least regionally, China will be a formidable military peer to the United States within the next two decades.

As a military peer, China will create different challenges for the United States than any previous potential adversary. China's mili-

tary is a complex combination of old and new—with philosophies as ancient as Sun Tzu and technologies as new as cyberspace. The spoils of economic success have combined with a unique military culture to produce a military rapidly rising in capability with particular emphasis on antiaccess capabilities and the ability to generate asymmetric effects.

This chapter looks at China's past and how the military evolved into what it is today. It examines current Chinese military organization, discusses China's distinctive military strategy and culture, and then provides an overview of current Chinese military capabilities. It also analyzes China's military development by examining current trends and projecting them in the context of Chinese military strategies, leading to an outline of projected Chinese military capabilities for the years ahead.

Historical Perspective of China's Military

For most of the last 4,000 years, China has been the world's dominant economic power. From the first century AD to the nineteenth century, China was responsible for at least 25 percent of the world's GDP, with a maximum of 33 percent in 1820.[1] However, as discussed in chapter 3, the influence of Western colonial powers beginning around 1840 led to a dramatic decline. By 1950 China represented only 5 percent of the global GDP. This was a period of continuing shame for the Chinese, often referred to as a "century of humiliation," which lasted more than a hundred years.[2]

In 1931 Japan invaded Manchuria in pursuit of Chinese territory and resources. The Japanese conflict escalated into open war in 1937 and continued until the Japanese defeat in World War II. During this time, the Chinese people suffered greatly at the hands of the Japanese occupiers, strengthening anti-Japanese sentiments in China.[3]

Chinese anger was also directed at the Nationalist government. The Nationalist government of Chiang Kai-shek was more concerned with exterminating Chinese Communists than the advancing Japanese forces. Although the Nationalists and Communists reached an uneasy agreement to resist the Japanese in 1937, the fragile alliance did not last long. From 1938 until the end of World War II, the two parties fought often, even in Japanese controlled areas. When the war ended, the country was on the brink of civil war.[4]

Despite US assistance during the war, the Nationalist Army was so weakened by the long war with Japan and by internal disorder that it was no match for the People's Liberation Army (PLA) of Mao Zedong. The Communists established the People's Republic of China in October 1949, and Chiang Kai-shek fled to the island of Taiwan with a few hundred thousand Nationalist supporters. In March 1950 Chiang again declared himself the president of the Republic of China, refusing to concede defeat to the Communists.

The Nationalist government enjoyed much international support and continued to declare itself the rightful government of China, which set the stage for the continuing conflict between the government in Beijing and the Republic of China on Taiwan.[5]

The PLA was initially used as the primary means of domestic control before the CCP created more elaborate internal policing structures.[6] The PLA also engaged foreign forces on several occasions, to include intervening in Korea (1950–52) and border conflicts with India (1962), the Soviet Union (1969), and Vietnam (1979).[7] Throughout this period, the military remained a land-focused force. Out of necessity, China's strategic culture emphasized manpower instead of technology to defend the homeland from invasion by a more advanced enemy. China did not have the ability to develop both a technologically advanced conventional and nuclear force, so Mao chose the nuclear path. The advent of nuclear weapons forced modernization on the PLA, but the strategy merely adapted nuclear weapons into previous concepts, articulated as the "People's War under Modern Conditions."[8]

Recognizing the tremendous gap in capabilities with the United States, the PLA began a program of long-term transformation under Deng Xiaoping. The PLA began to evolve from a manpower-focused, technology-challenged force into a smaller, technologically advanced force. Planning shifted from fighting a major defensive war for the homeland to preparing to fight wars at or near China's borders.[9] Also, the PLA focused more on joint doctrine and conducted a number of joint exercises to develop these capabilities.[10]

Modernization continues today as the PLA pursues a revolution in military affairs (RMA) with Chinese characteristics,[11] striving to build an army capable of winning information warfare.[12] Technology plays a pivotal role as China stresses the need to "accelerate change in the generating mode of war-fighting capabilities by drawing on scientific and technological advances" and "strives to make major breakthroughs in some basic, pioneering, and technological fields of strategic importance."[13]

China's Military Today

The PLA, often referred to as the CCP's "Great Wall," is first and foremost an army of the party. Chinese army officers take no oath to a constitution or nation, but instead declare in their oath of office to "closely unite around the Party Center."[14] The organization, command structure, and strategic culture of the Chinese military reflect the party's tight control of the PLA. The party wields the power of the army for both domestic and international goals, but recent advances in capabilities have generated a force optimized for defending China's borders and influencing Taiwan.

Military Organization

China's military is divided into three separate organizations: active and reserve units of the PLA, the Chinese People's Armed Police Force, and the People's Militia. The PLA is primarily responsible for defending China against external threats, while the police and militia are domestic-focused paramilitary organizations. By law, the police and PLA are separate, but there is some cooperation and sharing of personnel between agencies. Significantly, the PLA can be tasked with domestic security in extreme circumstances.[15] Other aspects of China's domestic security apparatus include the ministry of public security for law enforcement and the ministry of state security for intelligence and counterespionage.

The PLA consists of the army, PLA navy, PLA air forces, and strategic missile forces (2nd Artillery). Command authority of the PLA rests with the Central Military Committee (CMC), which is currently headed by Communist party general secretary Hu Jintao and includes the most senior military leaders, all of whom are party members (see fig. 17).[16] In September 2004 Hu Jintao added service chiefs from the air force, navy, and 2nd Artillery to the CMC to improve joint military cooperation and effectiveness.[17] During peacetime, the CCP standing committee acts as the national command authority, but in wartime authority passes to the CMC.[18]

The bulk of PLA forces are organized into seven distinct military regions, each with its own commander, who report directly to the CMC. These separate military regions function as separate "theaters" in peacetime, but during conflict a cross-theater joint structure may be created.[19] All ground, air, and sea forces fall under the military region commanders' authority except the independent 2nd Artillery.[20]

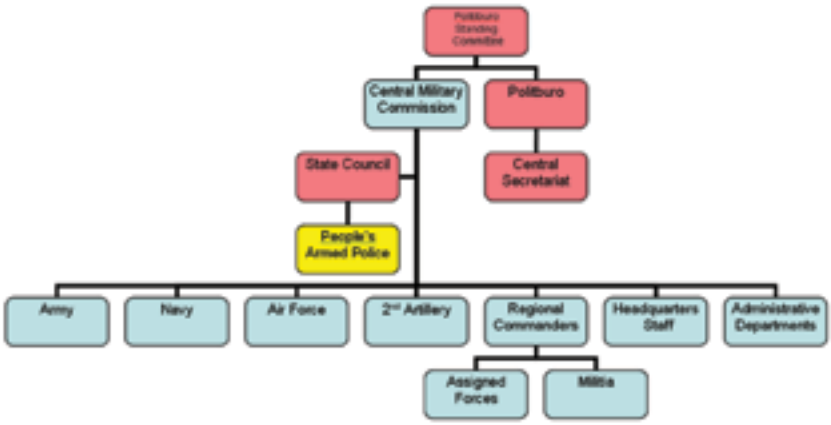

Figure 17. Chinese Communist Party and military command structure. (Reprinted from John W. Lewis and Litai Xue, *Imagined Enemies* [Stanford, CA: Stanford University Press, 2006], 26.)

The organizational "stovepipes" of the military regions help keep power from being concentrated in any one part of the military. This is consistent with the CCP's complex system of internal controls and monitoring of military leaders, epitomized by civilian leadership of the CMC. Also, the one-party system mutually benefits both the party and the PLA, making coup attempts by individual military leaders very difficult and unlikely to succeed.[21]

The Role of Unorthodox Forces in Chinese Military Strategy

Chinese military culture has thousands of years of history that continues to influence thinking today. Most famously, the teachings of the military philosopher and strategist Sun Tzu represent part of the cultural basis of Chinese military thinking.[22] Among his ideas, Tzu focused on the primacy of strategy, rather than brute strength, to manipulate the adversary, create opportunity, and obtain victory decisively. According to Tzu, the ultimate achievement in strategy is to defeat an enemy without using force.

In addition to valuing speed and surprise, a key element is the role of deception, made famous by Tzu's statement, "Warfare is the Way (Tao) of deception."[23] Of particular importance are Tzu's ideas regarding the role of "orthodox" (*cheng*) and "unorthodox" (*chi'i*) forces. Unorthodox tactics are characterized by employing forces in imaginative, innovative, and unexpected ways. Both are important, but "in battle one engages with the orthodox and gains victory through the unorthodox."[24] In fact, the original text always orders the forces as *chi'i*/*cheng* and unorthodox/orthodox, emphasizing the dominance of unorthodox before the orthodox.[25] This emphasis on indirect, unconventional methods of warfare takes on new significance when considering the implications of China's efforts to develop new technologies with potentially disruptive military effects, including capabilities for conflict in areas of directed energy (DE), space, and cyberspace.

When China goes to war, it will seek to paralyze first and then annihilate as quickly as possible. In attacking key, potentially paralyzing targets, Chinese doctrine calls for employment of *shashoujian* weapons, sometimes called "assassin's mace," as part of a doctrine called "the Inferior Defeats the Superior."[26] While not decisive alone, these advanced technology weapons include anything that produces both physically and psychologically asymmetric effects when targeted against enemy "acupuncture points."[27] China's short-range ballistic missiles (SRBM) are often cited as having an assassin's mace capability, as are the potential effects of cyber and electronic warfare (EW), DE, and space systems.[28] Reflecting Tzu's influence on China's military thinking, Chinese military modernization includes new conventional air, naval, and ground forces, but also

many more asymmetric or unorthodox capabilities that play major roles in Chinese military strategies.[29]

Current Military Capabilities

Through an aggressive program of foreign purchases, primarily Russian, and indigenous programs, China has developed significant capabilities for power projection, antiaccess, and area denial. For at least the next decade China's modernization program is focused on providing capabilities needed to prevent, if necessary, Taiwan independence.

Ballistic and Cruise Missiles

Currently, China has approximately 900 mobile SRBMs within range of Taiwan (see fig. 18).[30] This number is increasing by roughly 100 per year.[31] These include the DF-15 (CSS-6) and the DF-11 (CSS-7), both of which have a range of roughly 600 km, and both can carry high-explosive or nuclear warheads, as well as payloads designed to disrupt electronic systems and penetrate hardened targets.[32]

Figure 18. Chinese conventional short-range ballistic missile range. (Reprinted from US House of Representatives, *Chinese Military Modernization and Export Control Regimes: Hearings before the US-China Economic and Security Review Commission*, 109th Cong., 2nd sess., 29–30 March 2006, 23.)

The intercontinental ballistic missile (ICBM) force is also improving, including the road-mobile DF-31 and longer-range DF-31A, expected to be fielded within the year.[33] With an expected 11,270 kilometer (km) range, the DF-31A will be capable of targeting most of the world, including the continental United States, with a more flexible and survivable system than their 20 liquid-fueled, silo-based CSS-4 ICBMs.[34] China also has submarine-launched ballistic missiles (SLBM), including the JL-1 and soon the JL-2, both of which will provide very flexible capabilities to strike land and sea targets regionally and beyond.[35]

Another major focus of China's antiaccess capabilities is cruise missiles. They currently have a 200- to 300-km range land-attack cruise missile (LACM) and are working to develop more capable systems.[36] Reports from Taiwan indicate there may be more than 200 LACMs deployed and aimed at Taiwan.[37] The PLA navy also has several types of antiship cruise missiles (ASCM), including the new YJ-62[38] and the Russian-made Sunburn and Sizzler missiles[39] that are specifically designed to target aircraft carriers by defeating the Aegis antimissile system.[40]

Naval Power

Chinese naval forces are primarily designed for "green water" or littoral operations. The PLA navy includes 72 principal combatant ships, 58 attack submarines, and about 50 amphibious lift vehicles.[41] From Russia, China has procured a fleet of a dozen *Kilo*-class submarines with the Sizzler ASCM.[42] The navy's newest ship is the *Luzhou*-class guided missile destroyer with the Russian SA-20 surface-to-air missile (SAM) system.[43] The *Luzhou* complements the *Luyang II* destroyer and *Jiangkai II*-class frigate, which are also equipped with modern search and guidance radar and SAMs.[44] The navy also has emphasized the development of advanced mines to support its antiaccess strategy.[45] However, the Chinese navy has no aircraft carriers, nor is it near to deploying one.

Airpower

Air superiority over the Taiwan Strait is a very high priority for the PLA air force (PLAAF), so China has invested heavily in aircraft and air defense. More than 700 of the over 2,300 combat aircraft are capable of combat operations against Taiwan without refueling.[46] The Chinese air force has significant numbers of fourth-generation fighter aircraft, including over 300 Russian-built SU-27 and SU-30 fighters.[47] It also has licensed with Russia to coproduce its own variant of the SU-27, the J-11. In addition, China has developed and produced an indigenous fourth-generation fighter, the J-10.[48] These aircraft are equipped with modern air-to-air missiles, air-to-surface precision munitions, and cruise missiles.

China's air defenses feature Russian-purchased top-of-the-line systems, including the SA-10 and the SA-20, as well as indigenously produced HQ-9 and HQ-15 SAMs.[49] The range of these systems extends to the Taiwan coast (see fig. 19)[50] and presents considerable air superiority challenges for any Chinese adversary.[51] While the PLAAF has roughly 450 transport aircraft, aerial refueling capabilities are extremely limited. However, acquisition programs are under way to provide more refueling aircraft in the near future.[52]

Ground Forces

The PLA has 1.4 million active ground forces, of which 400,000 are located near the Taiwan Strait.[53] In general, ground forces have not received the same modernization resources as naval and air forces for the past 15 years, but lately they have received some attention. The PLA is fielding upgraded tanks, armored personnel carriers, and artillery. Of note is a new third-generation tank, the ZTZ-99, fielded in April 2006.[54] Also, the PLA has reportedly developed a new amphibious assault vehicle that, along with equipment upgrades and better training, has improved this capability considerably.[55]

Assassin's Mace Capabilities

There is much speculation and uncertainty regarding Chinese development and intentions for this class of technologies and systems. Certainly, China received tremendous attention when it demonstrated an ASAT ballistic system on 11 January 2007.[56] This

Figure 19. Chinese surface-to-air missile coverage over the Taiwan Strait. (Reprinted from DOD, *Military Power of the People's Republic of China 2009*, Annual Report to Congress [Washington, DC: DOD, 2009], 42.)

test represented not just a clear demonstration of space capability, but also spoke to the tremendous technical growth China achieved in recent years. Marine general James Cartwright, former commander of US Strategic Command (USSTRATCOM), testified that the successful test was "the third in a series. . . . the adjustments they made through those three tests to have a successful third test were good in terms of science, manufacturing and R&D [research and development] . . . They got there very quickly."[57]

However, China's ASAT test was just the most recent attempt to evaluate disruptive ASAT technologies. In September 2006 the Chinese used a high-powered laser to illuminate a US satellite—an action that can potentially "blind" or damage sensitive electronics and sensors.[58] China also has made notable strides in developing space-based capabilities. These include satellite systems for multispectral and synthetic-aperture radar imaging, navigation, and communications. Among the most impressive of its recent space achievements was China's second manned space mission in October 2005 and the launching of a lunar-orbiting satellite in November 2007.

China has also been perhaps the most notorious suspect in cyber attacks in recent years. US government computers were attacked in 2004 to collect information, and the attack was traced to China's Guangdong province.[59] General Cartwright recently testified that China is conducting "a substantial amount of reconnaissance" of US government and industry computer networks for information and identifying weaknesses.[60] China has been suspected of many other cyber attacks. Regardless of whether the attacks are state directed or not, there is a clear intention to further develop informational warfare capabilities including cyber attacks.

China's Military Modernization Path

China is in the midst of an organized modernization program that will transform the military into a formidable power. China's initial objective is to build the capability to influence and control affairs within the Taiwan Strait and the South China Sea. Within this limited geographical area, China will likely be a military peer to the United States not later than 2030.

In parallel, China is also building toward a longer-term goal—the ability to project power and protect its vital interests, particularly in the Western Pacific, the Middle East, and Africa. The US intelligence community estimated it would take until 2010 or later for China to be capable of defeating a moderate-sized modern force.[61]

The Path Ahead

China is managing international perceptions regarding its military growth, but Chinese intentions for this new power remain un-

certain. A feature of China's modernization is the desire to sustain military growth, yet grow slowly enough to inhibit anti-Chinese reactions. Hu Jintao's "peaceful rise" campaign is a concerted effort to characterize China's development as peaceful and calm regional fears of China's increasing military power.[62]

As mentioned in chapter 3, Deng Xiaoping's famous 24-Character Strategy stated that China should "observe calmly; secure our position; cope with affairs calmly; hide our capabilities and bide our time; be good at maintaining a low profile; never claim leadership."[63] This strategy led some to suggest that China is possibly a "patient hegemon."[64] Also, Lt Gen Mi Henyu, vice commandant of the Academy of Military Sciences, said that "for a relatively long time it will be absolutely necessary that we quietly nurse our sense of vengeance. . . . We must conceal our abilities and bide our time."[65]

For the next five to 10 years, China will continue focusing development on antiaccess capabilities, including "assassin's mace" weapons, to deter or counter any adversary near Chinese territory. Specific aims of the antiaccess strategy are to slow deployment of adversary forces and compel these forces to operate from distances farther than desired.[66] To achieve these aims, Chinese doctrinal writings propose a combination of conventional and asymmetric weapons. These include the use of ballistic and cruise missiles, aircraft, and covert operations to attack regional adversary bases. These same weapons, along with electronic jamming, ASAT weapons, electromagnetic pulse (EMP) weapons, and computer network attacks, are designed to degrade command and control and early-warning capabilities. Submarines, destroyers, aircraft, mines, cruise missiles, and conventional ballistic missiles may also be used to attack aircraft carriers, forcing them to operate up to 1,500 km away from China.[67]

Another trend in China's growing military power is the leveraging of foreign military purchases and technologies to obtain antiaccess capabilities. For at least the next 10 years, Chinese indigenous capabilities cannot meet their military goals. Foreign purchases will fill the gap while China leverages foreign aid to internally develop capabilities for much greater power projection beyond 2015.[68] The PLA is currently the world's largest buyer of foreign-made arms, including Russian aircraft, submarines, munitions, and satellite payloads.[69]

Not only do foreign purchases provide a leap in capability, China is also using these acquisitions to strengthen the Chinese industrial base and improve their ability to produce and innovate technology.[70] China has historically been weak in the advanced metallurgy required for fighter turbofan engines, but a long partnership with Rolls-Royce helped produce the QinLing engine for the JH-7A fighter-bomber.[71] Perhaps more significantly, this relationship may have enabled a Chinese breakthrough, as the WS-10A is China's first indigenous high-power fighter turbofan and may eventually

power China's fifth-generation fighters.[72] Chinese solid-propellant rocket motors also benefited when Martin Marietta helped improve a Chinese solid motor satellite perigee kick motor. The technical assistance reportedly helped China solve motor failures on the DF-21 ballistic missile.[73] China also partnered with Britain's Surrey Satellite Technology Ltd. to codevelop microsatellites, leading to speculation that Surrey's nanosatellite technology is at the core of Chinese small satellite development.[74]Relationships with Russian companies have also helped China in developing its own platforms, including Song submarines and the J-10 fourth-generation fighter.[75]

In parallel with producing antiaccess capabilities, China is also beginning to focus more resources on developing systems to project military power beyond the region.[76] New Chinese conventional theater ballistic missiles are capable of projecting power beyond Taiwan.[77] The PLA is also seeking to purchase or develop over-the-horizon sensors and space-based command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) assets to track distant naval targets.[78] The PLAAF will soon field its first-ever aerial refueling capability with the Russian Il-78 Midas and the indigenous B-6U, extending the range of strike and bomber aircraft beyond the Taiwan Strait.[79]Advanced destroyers and nuclear submarines, both Russian and Chinese made, will considerably advance China's naval power projection abilities.

The most visible sign of a blue water naval program is China's ongoing interest in deploying an aircraft carrier. In October 2006 Lt Gen Wang Zhiyuan, of the PLA's general armament department, stated the "Chinese army will study how to manufacture aircraft carriers so that we can develop our own. . . . [A]ircraft carriers are indispensable if we want to protect our interests in oceans."[80] Although China has expressed varying degrees of interest in carriers for more than 20 years, this most recent declaration comes at a time when it has a rapidly growing set of interests beyond its borders that may require protection and when its military has the resources to achieve this goal. Nevertheless, most analysts agree that Chinese efforts to deploy a carrier will likely not be successful much before 2015.[81] China might have multiple carriers by the early 2020s.[82]

Military Capabilities in 2030

China's military, fueled by economic growth and aided by foreign technology, will mature and represent a very modern, dangerous threat to any adversary by 2030. Much of China's ground and air forces will be regionally limited to the Taiwan Strait and the Yellow, East China, and South China Seas. However, China will be capable of projecting some aspect of military power beyond the region via aircraft carriers, submarines, conventional ballistic missiles, cyber-

space, and space platforms. China likely will not be an expeditionary force but will selectively use these projection options to ensure access to natural resources and commerce.

Conventional Military Forces

Naval forces will play a large part in China's future military plans. While an aircraft carrier may not be operational until 2015, China may have several carriers by 2030. Without these carriers, China will feel susceptible to US coercion regarding the flow of oil and commerce. Though a direct confrontation with a US carrier strike group is not likely, China is more likely to deploy these assets as a show of force near vital national interests. By deploying at least one carrier at all times, China will be able to patrol areas such as the Straits of Hormuz and Malacca to protect the flow of oil or off the coast of Africa as a show of force to influence any threats to Chinese interests there.

China will also have other necessary elements of an effective carrier strike group. Chinese-produced destroyers and submarines will complement their aircraft carriers, along with replenish-at-sea ships. China's shipyards already have the capability to produce ships for resupply of a blue water navy.[83] Chinese shipbuilders have made tremendous strides in quality, especially in key subsystems such as air defense, over the past 20 years.[84] Realistically, China will have all the elements necessary to deploy a carrier strike group in the next 10–20 years.

China is on track to field state-of-the-art ballistic missile and fast-attack nuclear-powered submarines, probably much sooner than 2030. China is currently building and testing a second-generation ballistic missile submarine, the *Jin*-class. The *Shang*-class attack submarine began sea trials in 2005.[85] If China succeeds in launching 10 new *Shang*-class submarines in the next few years, this would greatly strengthen and confirm China's commitment to a blue water navy.[86] Given these developments, China will plausibly develop a more advanced ballistic submarine capable of firing cruise or conventional ballistic missiles by 2030.

Ballistic and cruise missiles will continue to be a pillar of Chinese antiaccess strategy. China is expected to have hundreds of modern land-attack cruise missiles by 2030 and possibly several thousand SRBMs, if current trends persist.[87] Along with improved antiship cruise missiles, many of these systems are designed to penetrate carrier group defenses. The US Navy's sea basing concept, if employed, will provide attractive targets for Chinese SRBMs and cruise missiles. In addition, improved EMP warheads will specifically target naval electronic command and control systems. Supersonic, long-range, antiradar missiles, evolved from the Russian Kh-31, may also be used to target missile defense radars. Collectively, these systems will present a serious challenge for naval forces operating close to Chinese waters.

Technologically, Chinese air defense systems and aircraft are improving at a rapid pace. Modern SA-10/20 SAM systems, from both land and ships, provide coverage across the entire Taiwan Strait and make control of the air a serious challenge.[88] China is also developing one or possibly two fifth-generation fighters, which will likely be in the field by 2030. The J-12, manufactured by the Shenyang Aircraft Company, is similar in size and shape to the F-22. It is reportedly a twin-engine aircraft with stealth characteristics, an active, phased-array radar, internal weapons carriage, and thrust-vectored engines.[89] In parallel, Chengdu Aircraft is developing the J-10A, possibly based on the defunct Russian Mikoyan article 1.44 fighter. Perhaps with Russian assistance, Chinese engineers have designed this canard aircraft to be larger than the J-12 but with many of the same features. It possibly employs Russian plasma-stealth technology to provide stealth without significantly altering the fourth-generation fighter shape of the J-10.[90] Achieving air superiority will almost certainly be difficult and costly for any future Chinese adversary operating in the South China Sea.

Transport and refueling aircraft will also be vastly improved over current capabilities. Current efforts to buy more Russian Il-76 transport aircraft will improve the ability to deploy airborne troops.[91] Ukraine's Antonov aircraft company has sought Chinese investment to build a new version of the large AN-124 transport aircraft, capable of carrying 150 metric tons, far more than the 118 tons for a C-5B.[92] Also, in August 2007, China began assembling Airbus A320 aircraft in Tianjin. This is the most recent example of Airbus's commitment to industrial exchange and cooperation with the Chinese aviation industry. Through this relationship, China will likely have the ability to either procure or produce state-of-the-art transport and refueling aircraft in the next several years.

The PLA's 1.4 million ground forces did not receive the high-tech acquisitions of their navy and air force counterparts in the 1990s and 2000s, but modernization of the army is under way and will sustain them as a credible fighting force for the foreseeable future. Although the PLA will remain largely focused on domestic security, a growing number is dedicated to the Taiwan strategy. Increasingly, troops are conducting extensive joint operations and training in combined arms with air forces and navy in support of regional power projection.[93] One quarter of the PLA's current maneuver divisions and brigades focus on training for amphibious operations.[94]

China will soon deploy a new amphibious assault vehicle and is modernizing existing ones.[95] Over the next 20 years, Chinese shipbuilders will likely produce very large ferries that can carry hundreds of troops along with light armor, artillery, and supplies over distances of up to 1,000 nautical miles at speeds of around 60 knots. This will allow the PLA to quickly deploy large numbers of forces to the near abroad.[96] China also intends to imitate the US Army's Future Combat System capabilities and digitally inter-

connect sensors, platforms, and individual soldiers for greater speed and weapon system accuracy.[97] China's next-generation tanks, including the recently deployed ZTZ-99, are significant improvements over previous systems.[98] However, deploying heavy armor across the Taiwan Strait will rely on the success of China's antiaccess strategy to delay an adversary's naval forces.

Unconventional Military Forces

In addition to the conventional capabilities, China is also developing emerging, unconventional forms of military power including space and counterspace systems, DEWs, and information operations. Technological advances in these areas will generate new and improved capabilities that will challenge adversaries in any Chinese conflict.

Already a space power, China will continue to develop new means of force enhancement and application from space. According to USSTRATCOM commander General Cartwright, the Chinese are developing a "continuum of capability in space," fielding a "broad range of jamming ASAT-type capabilities, position navigation and timing, and also ISR-type [intelligence, surveillance, and reconnaissance] capabilities."[99]

The PLA is developing at least two new types of tracking and data-relay satellites to transmit real-time ISR and communications data, supporting control and targeting of cruise and ballistic missiles.[100] China already uses global positioning system (GPS) and the Russian global navigation satellite systems and is also investing in both the future European Galileo system and its own Beidou navigation system. The Beidou system has four satellites in geosynchronous orbit and provides 20-meter accuracy.[101] Although capabilities are limited, this developmental system is providing valuable technical experience and is thought to provide guidance for ICBMs.[102]

A new, independent, space-based navigation system named Compass is in development and may be operational sometime after 2020. To protect the new system, Chinese engineers plan to employ a navigational-signal frequency very close to the M-code on future GPS satellites. Any attempts by the United States to jam Compass signals would degrade or deny GPS users as well.[103]

Perhaps the area of greatest Chinese space interest is in countering the asymmetric advantages the United States enjoys via its space assets. Chinese analysis of recent US military operations have convinced China that the United States is dependent on its network of space-based assets, and the vulnerability of these assets creates a substantial weakness that may be exploited.[104] In the eyes of Chinese analysts, the US dependence on space represents "the U.S. military's 'soft ribs' and strategic weaknesses."[105]

In addition to the direct ascent ASAT attack, China is developing a family of ASAT options, including ground attack, co-orbital "killer" satellites, DEWs, and electronic attack.[106] Ground attack of stationary control segments and communication nodes with conventional forces, possibly ballistic or cruise missiles, is an increasing threat.[107] Direct ascent attacks, like the recent test, are currently capable of reaching satellites in low Earth orbit including valuable ISR assets. Soon a larger booster, such as the DF-31, may be used to threaten medium Earth orbit satellites such as GPS, or even geosynchronous communications and early warning systems.[108] However, the cost of using direct ascent to attack distant satellites, along with the difficulty of maintaining surprise, may make alternate methods more attractive.

China has an interest in producing very small "parasitic satellites" that can intercept and damage other satellites.[109] These agile killer satellites can deploy on small mobile boosters or as secondary payloads on larger "peaceful" missions, making them difficult to detect and track while preserving surprise. These satellites can remain dormant for years in relatively similar orbits to potential targets, and an attack can evolve slowly over hours or days as the satellite maneuvers to rendezvous with the target satellite.[110] Chinese strategists have openly and repeatedly called for development of such space weapons.[111] Given the level of interest and China's rapidly growing space experience, it seems reasonable to expect Chinese direct ascent and co-orbital satellite counterspace capabilities to threaten all US space assets by 2030.

Chinese literature describes extensive research and development on DE beam weapons.[112] US intelligence asserts that China could eventually field a laser capable of destroying, not just blinding, satellites.[113] Several ongoing research areas may produce a DEW, including a chemical oxygen iodine laser.[114] One of the most troublesome research areas is China's X-ray laser program. The preferred power source for such a laser is a small nuclear explosion, but China has been working on using high-powered lasers to produce X-ray lasing. Such a system has the potential to destroy electronics, trigger some types of munitions, or even set off nuclear weapons.[115]

Overt attack or destruction of space assets risks considerable consequences. China may prefer a more passive "denial of service" approach using EW to jam or disrupt satellite uplink and downlink signals.[116] Chinese military planners have written specifically on the means and benefits of EW attacks on satellite links, including using these methods to deny GPS to US users and systems.[117]

DE weapons will likely threaten ground, sea, and air assets and represent significant Chinese defensive and offensive firepower in the future. In addition to lasers, high-power microwave (HPM) weapons are also relatively mature and may be used for air defense, antiship, and ASAT missions. Chinese military planners believe HPM will be the "superstar" of DEWs in the twenty-first cen-

tury.[118] Similar in effects to an EMP, pulsed HPM weapons generate a sustained barrage of high-power electromagnetic energy that can disable or destroy electronic platforms.[119] The latest Western research suggests it may be possible to multiply the speed and power of HPM pulses without huge electrical generators.[120] This research lends credibility to Chinese efforts to develop small, weaponized HPM systems.

China has several programs to develop HPM assets, including warheads, beam weapons, and advanced sensors. Efforts to produce smaller, effective EMP warheads may be operational within 10 years.[121] HPM air defense systems—which could disrupt the electronics on precision-guided munitions or aircraft and air-launched HPM antisatellite weapons—may be operational after 2020.[122] This technology is also being developed into smaller, more powerful jammers, nonkinetic beam weapons for disabling cruise and antiship missiles, and stealth-detecting sensors. As a sensor, HPM technology could generate enough power for a fighter aircraft sensor to detect stealth objects at 100 miles with one-meter resolution.[123] While these concepts are at different stages of development, HPM weapons will play a significant role in Chinese military strategy by 2030.

Translated Chinese writings reveal clear intentions to develop and employ a very integrated information warfare (IW) strategy that will be used in concert with other forms of national power. China views Western information infrastructure, including command and control systems, as relatively weak and vulnerable to attack. They predict that key "trump cards" of future wars will include computer network attacks, viruses, and hackers, as well as EMP/HPM weapons and antisatellite capabilities.[124] These information attacks are intended to not only impact military forces but also disrupt financial, transportation, and other electronic systems to harm adversaries politically, economically, and psychologically.[125]

Inserting a virus into the enemy's command and control computer during peacetime and then rendering the computer unusable at the desired time is one proposed employment method.[126] Such "sleeper" code strategies raise concerns for commercial hardware made in China. Also, Chinese writers have proposed "virtual warfare" using virtual reality and computer imaging technology to produce false images on sensor displays, propaganda imagery, or even holographic religious icons to create confusion and hesitation.[127] Retired major general Dai Qingmin, former head of the IW directorate of the Chinese general staff, describes China's approach to IW as integrated network and electronic warfare. China's goal is to achieve "information supremacy," thereby increasing battlefield transparency for Chinese commanders while creating "fog" for their enemy.[128]

By 2030 China will use its well-developed asymmetric forces to confuse, weaken, and slow its adversaries. After several decades of sustained growth and modernization, China will be a military peer

of the United States, at least regionally, and a formidable rival with limited blue water naval capabilities.

Conclusion

Whether China sincerely seeks a "peaceful rise" or plans to maximize its global balance of power, the United States must pay close attention to growing Chinese military capabilities. At present, the United States' advantages in critical military technologies and conventional forces provide a valuable deterrent. Dennis Wilder, senior director for East Asian Affairs, National Security Council, explains that, for now, "the F-22 is ten feet tall in the eyes of the Chinese."[129] Some congressional leaders have expressed the need to strengthen the US military. The chairman of the House Defense Appropriations subcommittee recently said he now believes there could be a greater need for F-22 fighters than currently planned "because of what's happening in China."[130] But inevitably, China will close the technology gap with the United States in key areas by 2030.

On its current pace, China's economy will dominate Asia and much of the world by 2030, and militarily, China will be a near-peer to the United States. China will employ its military strength to defend its borders, maintain domestic control, and protect vital interests in Asia, Africa, and the Middle East. As China develops, it will rely heavily on asymmetric technologies to exploit vulnerabilities and give Chinese military forces an advantage.

China's strategy of military modernization and growth has produced varying degrees of concern internationally. China's future as a military power is fairly clear, but forecasting Chinese intentions for this power is much more difficult. Theories will persist regarding China's intentions, whether it will maintain the status quo or transform into a revisionist power, but the mere existence of that military power requires careful military and diplomatic planning by the United States.

Notes

1. Angus Maddison, *World Population, GDP and Per Capita GDP, 1-2003 AD* (Groningen, Netherlands: University of Groningen, 2007), http://www.ggdc.net/maddison (accessed 27 January 2008).

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3. As stated, Chinese casualties were in the tens of millions.

4. As discussed in chapters 2 and 3, a government that rules improperly loses the "Mandate of Heaven," from which uprising becomes legitimate. While communism is not a philosophy directly congruent with Confucianism, the actions by the rebels at the time are in concert with the prevailing culture.

5. Edwin E. Moise, *Modern China, A History* (London and New York, NY: Longman, 1986), 87–123.

6. Andrew Scobell, *China's Use of Military Force, Beyond the Great Wall and the Long March* (Cambridge, England: Cambridge University Press, 2003), 70.

7. Mark A. Ryan, David M. Finkelstein, and Michael A. McDevitt, *Chinese Warfighting, The PLA Experience since 1949* (Armonk, NY: M. E. Sharpe, 2003), 123–240.

8. Ibid., 12, 39–40.

9. David M. Finklestein, "China's National Military Strategy," in *The People's Liberation Army in the Information Age*, ed. James C. Mulvenon and Richard H. Yang (Santa Monica, CA: RAND, 1999), 135–38.

10. Office of the Secretary of Defense (OSD), *Military Power of the People's Republic of China 2007*, Annual Report to Congress (Washington, DC: OSD, 2007), 15. Note: The reader should be aware that this source is an annual report. At the time of the original reporting of this study, the 2007 version was current. Where the data has changed, this book has been updated with the most recent (2009) study, and this is annotated in the notes. Where the 2009 report is essentially unchanged from the original, the original 2007 citations have been left unaltered and as originally written by Dr. Sandfry.

11. "China's National Defense in 2004," *People's Daily* (Beijing), 3 January 2005.

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15. Blasko, *Chinese Army Today*, 18.

16. John W. Lewis and Litai Xue, *Imagined Enemies* (Stanford, CA: Stanford University Press, 2006), 26.

17. Blasko, *Chinese Army Today*, 27.

18. Lewis and Xue, *Imagined Enemies*, 114–15.

19. Ibid., 121–24.

20. Blasko, *Chinese Army Today*, 32.

21. Shiping Zheng, "The New Era in Chinese Elite Politics," *Issues and Studies* 41, no. 1 (March 2005): 198.

22. To say that Sun Tzu is the entire basis of Chinese thinking is overly simplistic. However, the writings of Sun Tzu do capture much of the Chinese military philosophies, and his is the one ancient Chinese text that is required reading at the military war colleges in the United States. Readers interested in delving further into ancient Chinese texts should consider *T'ai Kung's Six Secret Teachings*, *Methods of the Ssu-ma*, *Wu-tu*, *Wei Liao-tzu*, *Three Strategies of Huang Shih-Kung*, and *Questions and Replies between T'ang T'ai-tsung and Li Wei-kung* in Ralph D. Sawyer, *The Seven Military Classics of Ancient China* (Boulder, CO: Westview Press, 1993).

23. Sun Tzu, *Art of War*, trans. Ralph D. Sawyer (Boulder, CO: Westview Press, 1994), 136.

24. Ibid., 148.

25. Ibid., 147.

26. Michael Pillsbury, *China's Military Strategy toward the U.S.: A View from Open Sources* (Washington DC: US-China Economic and Security Review Commission, 2 November 2001), 8, http://www.uscc.gov/researchpapers/2000_2003/pdfs/strat.pdf (accessed 7 February 2009).

27. Ibid., 9.

28. Lewis and Xue, *Imagined Enemies*, 144.

29. There is also evidence of a rapidly increasing emphasis within China in the nanotechnology realm. Nanotechnology publications have increased nearly twentyfold in the past 10 years, and efforts to derive commercial benefits from this research have been notably lacking. See Li Liu and Jingjing Zhang, "Characterizing Nanotechnology Research in China," *Science, Technology, and Society* 12, no. 2 (July-December 2007): 201–16. While military implications of this research are sketchy at best, this has led some to suggest that China is working on a nanotechnology "Manhattan Project" and that a similar response is needed by the

United States. See Lev Navrosov, "Unrestricted Warfare Planned by China," *Newsmax*, 11 October 2007, http://www.newsmax.com/navrozov/china_war/2007/10/11/40121.html (accessed 27 January 2009).

30. US House of Representatives, *Chinese Military Modernization and Export Control Regimes: Hearings before the US-China Economic and Security Review Commission*, 109th Cong., 2nd sess., 29–30 March 2006, 23.

31. Liu and Zhang, "Characterizing Nanotechnology Research," 3.

32. *Jane's Sentinel Security Assessment—China and Northeast Asia* (Berkshire, UK: Jane's Information Group, Ltd., 17 October 2007), 12.

33. OSD, *Military Power of the People's Republic of China 2007*, 3.

34. Ibid., 18–19.

35. Ibid., 19.

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37. US House of Representatives, *Chinese Military Modernization*.

38. Jonathan Weng, "China's YJ-62 Anti-ship Missile Unveiled," *Military Technology* 30, no. 12 (2006): 117.

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40. House, *Chinese Military Modernization*, 3.

41. OSD, *Military Power of the People's Republic of China 2007*, 3.

42. House, *Chinese Military Modernization*, 3.

43. OSD, *Military Power of the People's Republic of China 2007*, 3.

44. House, *Chinese Military Modernization*, 4.

45. OSD, *Military Power of the People's Republic of China 2007*, 3.

46. Ibid., 38.

47. Joe Yoon, "Fighter Generations," http://www.aerospaceweb.org/question/history/q0182.shtml (accessed 2 February 2009). Fourth-generation fighters are roughly equivalent in technology to the US F-15, F-16, or F-18.

48. US House of Representatives, *China Military Modernization*, 4.

49. OSD, *Military Power of the People's Republic of China 2007*, 18.

50. Department of Defense (DOD), *Military Power of the People's Republic of China 2009*, Annual Report to Congress (Washington, DC: DOD, 2009), 42. This picture is captioned in the report as "This map depicts notional coverage based on the range of the Russian-designed SA-20 PMU2 surface-to-air missile system and the CSS-6 and CSS-7 short-range ballistic missiles. Actual coverage would be noncontiguous and dependent upon precise deployment sites. If deployed near the Taiwan Strait, the PMU2's extended range provides the People's Liberation Army's SAM force with an offensive capability against Taiwan aircraft."

51. Ibid., 31.

52. Ibid., 24.

53. DOD, *Military Power of the People's Republic of China 2009*, 36.

54. Ibid., 4.

55. Ibid., 4–5.

56. Robert F. Dorr, "Weaponry and Wake-up Calls," *Aerospace America*, June 2007, 7.

57. US House of Representatives, *China Military Modernization*, 69.

58. Warren Ferster and Colin Clark, "NRO Confirms Chinese Laser Test Illuminated U.S. Spacecraft," *Defense News*, 2 October 2006, 28.

59. Wendell Minnick, "Computer Attacks from China Leave Many Questions," *Defense News*, 13 August 2007, 14.

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62. Willy Wo-Lap Lam, *Chinese Politics in the Hu Jintao Era* (Armonk, NY: M. E. Sharpe, 2006), 166.

63. OSD, *Military Power of the People's Republic of China 2007*, 6.

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65. Ibid.

66. Roger Cliff et al., *Entering the Dragon's Lair, Chinese Antiaccess Strategies and Their Implications for the United States* (Santa Monica, CA: RAND Corp., 2007), 11.

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68. Richard D. Fisher Jr., *The Impact of Foreign Weapons and Technology on the Modernization of China's People's Liberation Army* (Washington, DC: US-China Economic and Security Review Commission, January 2004), 1, http://www.uscc.gov/researchpapers/2004/04fisher_report/04_01_01fisherreport.php (accessed 8 February 2009).

69. Ibid., 1.

70. Ibid., 6.

71. Ibid., 36.

72. Ibid.

73. Kenneth Timmerman, "Chinese Missiles in the New World Order," *Washington Times*, 24 May 2000, A19.

74. Fisher, *The Impact of Foreign Weapons and Technology*, 19.

75. Ibid., 25.

76. OSD, *Military Power of the People's Republic of China 2007*, 23.

77. Ibid.

78. Ibid., 16.

79. Ibid., 18.

80. Ibid., 24.

81. DOD, *Annual Report to Congress: Military Power of the People's Republic of China 2009*, http://www.defenselink.mil/pubs/pdfs/China_Military_Power_Report_2009.pdf (accessed 29 April 2009), 40. China has already commenced training pilots for carrier operations. Full deployment of a carrier will take time. Full training and experimentation to develop indigenous Chinese doctrine for how best to employ a carrier will likely take even more time. Nonetheless, China is likely to have naval aircraft carrier capabilities and the ability to project at least limited combat power from carriers within 10 years.

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83. US House of Representatives, *China Military Modernization*, 4.

84. Keith Crane et al., *Modernizing China's Military: Opportunities and Constraints* (Santa Monica, CA: RAND Corp., 2005), 180–83.

85. OSD, *Military Power of the People's Republic of China 2007*, 3.

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94. Ibid.

95. OSD, *Military Power of the People's Republic of China 2007*, 4.

96. Fisher, *Impact of Foreign Weapons*, 43.

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99. US House of Representatives, *China Military Modernization,* 70.

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101. OSD, *Military Power of the People's Republic of China 2007*, 21.

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103. Peter B. Selding, "Europeans Raise Red Flags over Chinese Satellite Navigation Plan," *Space News*, 12 June 2006, 1.

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112. Mark A. Stokes, *China's Strategic Modernization: Implications for the United States* (Carlisle, PA: Strategic Studies Institute, 1999), 195–206.

113. Robert Wall, "Chinese Advance in Electronic Attack," *Aviation Week & Space Technology* 157, no. 18 (28 October 2002): 70.

114. Stokes, *China's Strategic Modernization*, 199.

115. Ibid., 198.

116. Tellis, "China's Military Space Strategy," 58.

117. Dean Cheng, *PLA Views on Space: The Prerequisite for Information Dominance*, CME D0016978.A1 (Alexandria, VA: The CNA Corporation, October 2007), 9.

118. Stokes, *China's Strategic Modernization*, 201.

119. Edward P. Scannell, "Progress in Directed Energy Weapons, Part II: High Power Microwave Weapons," *WSTIAC Quarterly* 4, no. 3 (Fall 2003): 1–10.

120. David A. Fulghum, "HPM Gets Cheap: Light Boosts Destructive Power of Microwave Weapons, Sensors," *Aviation Week & Space Technology* 166, no. 4 (22 January 2007): 42.

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Chapter 6

Harmonious Discordance

China in 2030

Col John P. Geis II, PhD

The previous chapters present a detailed description of how China has risen to its present position. The authors also illuminated the policies and path China is currently following and the likely consequences these decisions will have in the immediate future. This chapter seeks to look specifically at the target year of 2030 and describe in very general terms the nature of China in that year as a fellow member of the international system.[1] This scenario contains no major surprises or wild cards. It is the simple and logical continuation of the policies and trends the Chinese government is currently following. What follows is based on their internal government plans as well as mainstream economic projections.

The authors conclude that in 2030 China will become a peer to the United States in the international system. Its culture will remain fairly constant; its political system will be in its sixth post-Mao generation; its economy will likely be ahead of the United States, though per capita income will still lag behind; and its military spending, while likely greater than that of the United States, will not yet have produced a military fully equal to our own.

The Culture and Demographics of China in 2030

Despite the numerous outward developments over the preceding 50 years, China in 2030 will likely continue to be influenced greatly by its historical cultural ideals. The influence of Confucianism will continue as the prevalent underlying basis for much of the Chinese approach to governance and behavior. While the growing population continues to struggle with the burden of developing into a "superpower," it does so in deference to the authoritarian regime that continues to monitor and control society.[2]

Aside from the basic underlying philosophy of Confucianism, some minor changes in religious affiliation among the populace are foreseen. China will likely continue its tradition as a nonreligious country with less than 40 percent of the population claiming religious affiliation. Buddhism will still dominate as the religion of choice for those who claim an affiliation. However, the CCP will continue to monitor and control Buddhism to ensure it does not compete for power with the ruling party. Islam may grow in popularity in western China but will

not significantly intrude into populated regions. Christianity will grow considerably. Evidence of some increase in tolerance of the Christian faith can be found in the recent Vatican appointment of a Chinese cardinal with the concurrence of Beijing.[3] Nonetheless, while on the rise, Christianity will still be a minor Chinese religion in 2030. As stated, the dominant ideology followed by the majority of Chinese in 2030 will continue to be Confucianism, which is officially promoted by the CCP as a means for improving the harmonious society.

Since the early twenty-first century, the CCP has taken a road of incremental democratization to allow the party to stay in power but has also increased the level of participation at the lowest levels. This path has been gradual in nature and has followed the Singapore model. There democratic reforms were made, but the freedoms that went with those reforms were controlled. Over time both the Singaporean and Chinese systems have relied on Confucian ideals and strong economic programs to keep the ruling party in power. As David Shambaugh advocated, incremental democracy encourages dynamic stability so that political reform is used to "keep social and political order." In essence, the CCP will likely allow demonstrations and carefully manage how it deals with them to ensure that public concerns are addressed but not in a way that calls into question the mandate for the party to rule the people.

Despite the prevalence of Confucian culture, some Western practices will become more ingrained in Chinese society. The education system will probably continue to evolve along the Western model. Large numbers of Chinese elites are being educated in Western universities today, and this will likely continue the trend of the "Westernization" of major universities in China itself. This trend, which occurred in the 1800s and again after the death of Mao Zedong, is expected to persist.[4]

This increased Westernization of education will also likely result in greater awareness of perspectives that lie outside China's boundaries. In areas from fashion to the Internet, the younger generation will probably adopt many aspects of the lifestyles of their Western counterparts though they may be somewhat behind.[5] As a result, the younger generation will behave in a less inhibited manner in their personal lives and, like their Western counterparts, will seek to explore their individuality and personal freedom. Thus, over time China is expected to be a freer, more educated, and more developed society, but with only sporadic and minor challenges to the CCP's authoritarian rule.

Chinese demographics pose a potential problem. After a period of rapid population expansion in the early days of the CCP, the "one child" policy and other social pressures will have effectively slowed population growth to one of the slowest rates in the world among developed nations. China's population will reach 1.46 billion (to include Taiwan and all administrative regions) with a projected peak around the year 2045 of below 1.6 billion (see fig. 20).[6]

Figure 20. China's population projected to 2050. (Reprinted from Goldman Sachs, *BRICs and Beyond* [New York, NY: Goldman Sachs, 2006], 47.)

While population control has been quite effective, the number of young people has been reduced, which will result in a substantial graying of Chinese society by 2030 (see fig. 21).[7] The increased number of elderly will eventually affect both societal norms and potentially the economic base. By 2030 over 500 million Chinese will be in the over-50 category, which at that time will account for 37 percent of the total population. This trend will likely worsen even further with time, meaning that the number of workers in their prime working years will be approximately equal to those over 50 years of age.[8] Social strains on the system or forcing workers into longer careers may take place.

While migration in and out of China has increased considerably, the apparent homogeneity of Chinese society should remain relatively unchanged. China in 2030 will still have approximately 91 percent of the population claiming Han-Chinese roots.

By 2030 the Chinese population will be aging rapidly. As a result the younger generation will probably become the most educated of any generation in Chinese history. With only 17 percent of the population in the 5–19 age group, the burden on the education system will have decreased. This, in turn, will increase the opportunity and, thus, the percentage of youth who completes primary and

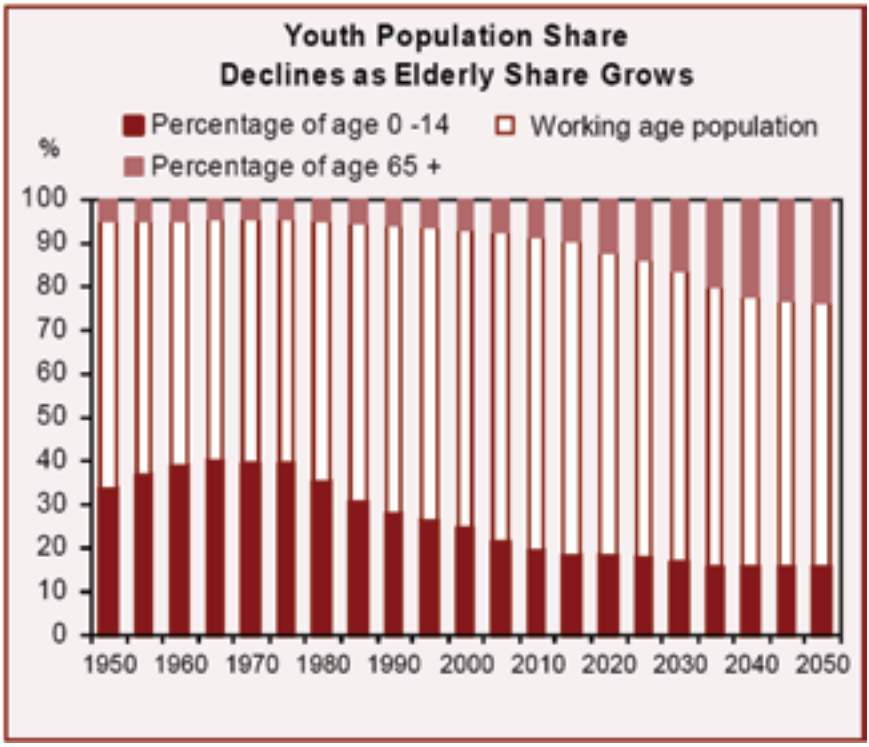

Figure 21. China's population distribution by age projected to 2050. (Reprinted from Goldman Sachs, *BRICs and Beyond* [New York, NY: Goldman Sachs, 2006], 47.)

secondary education. By 2030 these figures will likely be more than 90 percent. Attendance in primary and secondary school is expected to be on par with Western norms at over 99 and 95 percent, respectively. Furthermore, higher education will continue to benefit from the economic boom. Chinese policies to improve the university system result in many of China's universities (over 100) being considered equivalent to their Western counterparts.[9] In addition, given the smaller numbers of youth entering the workforce, a greater percentage of them should be able to find jobs commensurate with their degrees and expertise, as competition for these positions will be lessened. Overall, the improvement of China's education system will effectively improve its ability to compete intellectually on the world market and internally raise the literacy rate to over 95 percent, placing China in the top 15 nations of the world.

Finally, by 2030 China will have evolved into a modern nation where most of the population enjoys modern conveniences and ties to the global environment. Connection to the Internet will be commonplace and not a novelty in any region. China will be one of the leaders in technical expertise, and the majority of the 50-and-below generation will be technically literate and computer savvy. The government will have ceased trying to control the flow of information

and connectivity to the Internet. Younger generations will be fully connected with virtual identities and all of the resultant intellectual benefits and stimulus found throughout the West. Life in major Chinese cities will resemble those found anywhere on the globe.

Overall, the population will be content with the state of affairs in China, but there are issues that will cause growing concern in the coming years. The two biggest issues are the aging population and the environment. With an ever-decreasing workforce providing for an increasingly elderly population, serious economic questions must be addressed. High health care costs make these questions more difficult.[10] In addition, environmental concerns and worries over water scarcity will weigh heavily. These two issues together have the potential to create widespread discontent beyond the younger generation into the middle-aged generation. If these issues are not dealt with properly in the middle of the twenty-first century, a rising opposition, possibly under a democratic banner, could challenge the CCP.

Chinese Politics in 2030

China's ruling body in 2030 at first sight might look like an incremental product of its predecessors, but the "sixth generation" of leaders is likely to have a very different perspective based on the challenges they faced in coming to power in addition to the unrelenting geopolitical straits they now navigate.[11] The 50 years prior to 2030 were underscored by China's converting its resources, both human and natural, into affluence. Although China has been a regional power, by 2030 the CCP will be in a position to convert its affluence into influence, matching the United States in its status as a superpower. Linkage to the rhetoric of the harmonious society, scientific development concept, and the *Five Principles of Peaceful Coexistence* will endure; however, Chinese leaders will look to strategic options that challenge the United States' global position.

Sixth Generation—Veterans of Crisis

Whether successors to the top posts in China by 2030 are mentored and promoted by Xi Jinping or Li Keqiang, the leading fifth-generation members, they probably will have risen during a period of repeated crises that tested the core of the CCP's mandate to rule. In coming to power, they will have had considerable time to study the office of the president and closely observe the standing politburo committee. They will have handled China's reaction to economic turmoil, worked to enact stopgap reforms to answer public outrage about environmental issues, and confronted domestic terrorism from groups like the Eastern Turkestan Islamic Movement.[12] Also during this period, these leaders will have managed conflict, which affects China's new interests in Africa, and will have worked

to mitigate competition across every axis from India, all with the Taiwan scenario potentially left unresolved.[13] The only way the ruling elite has remained viable through this upheaval is the willingness to yield to the public in terms of major system reform. It seems the Chinese people will forego major political upheaval as long as CCP policies continue to morph to their benefit. The logical result is that China will reach 2030 with a well-tested group of leaders whose decisions may well be predictable based on their objective to sustain the mandate of the Chinese populace.

More Democracy?

The CCP will continue to roll out democratic reforms and experiments but at a very measured pace. Membership and an active role in the CCP will likely remain selective through 2030. However, by 2030 participation in the government will be possible from local to national levels through tightly controlled elective processes. Nonparty seats will be very small in number and have very limited voting rights. The result will be a vehicle that enables an accurate representation of public opinion to make it up through the system to the decision-making elite without challenging the power structure or party dominance. The "relief valve" sought and gained from this policy is a major decrease in the tens of thousands of protests occurring across the country each year. That being stated, the "door" to democracy could be opened, with new voices allowed into the Chinese political discourse.

The CCP is expected to continue its growth, reaching approximately 150 million by 2030, compared to its 74 million members in 2007. It will be reflective of all demographic groups in the nation. The trends shown in chapter 3 will continue, with membership no longer predicated on adherence to a specific ideology. Ascension into the higher echelons of power, position, and access will continue the existing trends of the elites composed mainly of "new wealth" barons. Forays into elective positions on the Central Committee will continue to be more of a symbolic gesture rather than power sharing. Democracy with Chinese characteristics will resemble something more analogous to a "China, Inc." model, made up of the capitalist and top strata as board members in the 2,500-member ruling body as opposed to reformed communists raised during the Cultural Revolution. As a result, China will remain a centrally controlled, authoritarian-ruled nation as it has been throughout its long history.

Power, but not Absolute

The sixth generation will preside over great power in terms of wealth, influence, and military might. By 2030 China's economic growth will have gradually slowed to a more modest 4–6 percent, rather than the explosive double-digit growth at the start of the

century. China will be fully integrated in the global political system holding memberships or partnerships in almost every union and treaty organization in the world to include the United Nations, ASEAN, APEC, the African Union, and the European Union. It will also enjoy the prestige of being the founding member of the SCO, covering most of central and southwest Asia.

As discussed in chapter 5, the PLA will become a formidable force. While Chinese politicians will likely hold fast to their rhetoric that China lacks capabilities and the world should not view its military as a threat, its military will be rapidly increasing in strength. The world will be concerned about China's military strength, and the Assassin's Mace–class (Sha Shou Jian, 沙守建) weaponry—a suite of nano, bio, genetic, and directed-energy weapons geared to achieve decisive asymmetric victory. This may give China's authoritarian leaders more options, but in reality, their power will be far from absolute.

China's 2030 population of 1.46 billion will have grown in parallel with its rising affluence. As public demonstrations increased in the 1990s and 2000s, the CCP was compelled to announce initiatives to address the environment, rule of law, corruption, and wealth disparity.[14] Over the next 20 years, these reforms will probably be effective, as a failure to achieve some level of success could be tantamount to relinquishing the Mandate of Heaven. However, this will almost certainly cause the people to understand that while China is a one-party authoritarian system, it is beholden at some level to its people. "China Inc.," where the people are stockholders and the CCP the board, may be the best metaphor to describe the evolving Chinese system. For the stockholders (population) in 2030, it is clear that stability and wealth will be more important national values than freedom and democracy. As their affluence grows, so too will their expectations of what their leadership should be able to provide. Whether or not the sixth generation succeeds depends in large part on its international policy and strategy.

The Global Politik

The world of 2030 will be complicated. The world will no longer be globalizing—it will be globalized. In 2030 the phenomena Tom Friedman aptly identified in *The World Is Flat* will be a postmortem case study. Alternative energies may rival or even surpass oil as the main driver of the world's economies—a development that could lead to almost as many geopolitical crises as when oil was scarce. China's interests in Africa may drive it to join in bilateral and multilateral partnerships to address new security issues in Africa and the Middle East that arise from the planet's oil-producing countries' decreasing incomes. The race among developed countries will now largely be for product market share.

China's focus on the United States as an adversary will lose ground to concerns over India by the middle of the century, as India is expected to grow into an economy surpassing the United States and rivaling China around this time frame.[15] While in 2030 China will still be the largest economy in Asia, India's economic output will be rapidly rising with an economy similar to China's in every way, except that India's system will continue to be based on democracy. Within Asia, China's claim to the Spratley Island group will be secure, and China's influence will be sufficient to have secured port agreements with most nations in the region, including Burma, Malaysia, and Pakistan.

Although relations with the United States should remain stable, the sixth generation of post-Mao leadership will resent continued US basing in the Pacific and will structure its rhetoric accordingly. It will routinely question US motives in maintaining an obsolete structure when China can and will be willing to guarantee the region's free trade and security. Japan, Korea, and Australia will likely seek a US presence to provide a counterbalance to China, but for political reasons they will need to be guarded about their public messages leaning too far in either direction. With China seeking to potentially adopt the Singapore model (much of Singapore's indigenous population is ethnic Chinese), close relations between these two countries seem almost certain. The United States may lose any chance for basing rights in Singapore in the event of a conflict with China. Because the Chinese may have both areas of agreement and disagreement with the United States simultaneously, a "compartmented diplomacy system" is a plausible outcome. Such an approach would be based on pragmatism, in which areas where Sino-US cooperation of mutual benefit are diplomatically separated from those areas of disagreement.

The Mandate

Throughout the dynastic periods and even today, the Chinese people have acquiesced to centralized power when ruled justly. The mandate of heaven tenant is an essential element held by those in power, and when lost, regime change may quickly follow. This concern may be a constant worry of China's leaders in 2030. It is the Chinese people in the year 2030 who hold that mandate, and even without voting rights, they will be cognizant of this fact. The Chinese leadership will have to make all policy decisions in that prism. This makes decisions predictable as long as Chinese public opinion can be anticipated. Predicting flashpoints within China is as important as being able to counter its diplomatic, cyber, military, or economic capabilities.

The concern is what happens if the economy or environment suddenly goes awry. Whether due to resources, the interconnectedness of the global economy, climate change, or other factors, if it

appears that China's political leaders are close to losing their mandate, the situation could become dangerous. Some heads of state are more inclined to use force when concerned about domestic public opinion.[16] As a result, the United States must be ready for some type of conflict should a dying regime do whatever it feels is necessary to save itself.

China's Economy in 2030

The future of China's economy will be the result of many internal and external forces that play out between now and 2030. By 2030 China, guided by the principles of "Harmonious Society," will have the world's largest economy and will surpass the United States in economic size. China will gain international recognition as a peer to the United States on the international stage and will secure its status as the preeminent regional power in Southeastern Asia. Although China's total economic output will surpass the economy of the United States, it will require further growth to fulfill the needs of its population. China's per capita GDP will still lag behind most of the West and will likely be around $18,000.[17]

To support needed growth, China's economy will successfully transition from one of reproduction to one of innovation. The foundation for the necessary shift was constructed by Hu Jintao's Harmonious Society address in 2007. Subsequent investment by the Chinese government in science and technology is leading to China's explosive technological advancements, which will enable it to achieve peer status with the United States in technological innovation. Another enabler to China's successful economic ascendance is the divestment of state-owned enterprises and its transition to a market-driven economy with "Chinese characteristics." By 2030 China will probably have found ways to overcome its internal migration issues, allowing its labor force to better react to market demands.

China's economic success as it transitions to a developed nation will bring with it the creation of a consuming middle class. For instance, China's overcrowded super highways will see at least 40 million additional automobiles beyond the numbers of 2007. Even with increases in efficiency, China's sustained growth will increase energy consumption by at least 150 percent over the next 22 years, and this assumes its energy efficiency efforts have cut in half the number of barrels of oil to produce a given level of economic output. China's demand on the world's energy resources, along with a resurgent Russian and developing Indian economy, will certainly place pressure on world fossil fuel markets and will drive global investment in alternative energies.

Despite China's efforts to increase energy efficiency and secure access to energy markets, it will likely rely heavily on its own coal resources, as they are available and reliable. This will be especially true between 2010 and 2020, which will result in high levels of

greenhouse gas emissions and pollution. As the calendar ticks toward 2030, China's growth rates will decline as it will encounter increased requirements to invest in research and development for alternative-energy technology, and the cost of energy will eventually take a toll. As a result China's GDP growth rate will fall into the range of 5–6 percent.

China's economic growth has been the source of much concern throughout the world as greenhouse emissions and pollution continue to rise. These problems became clear to the world as a result of China's preparations to host the 2008 Summer Olympics.[18] This was acknowledged in Hu Jintao's speech to the 17th CCP Congress. There the president advocated the development of laws and policies to reverse the trend of pollution and restore the environment.[19] However, corruption and its impact on the fledgling rule of law and establishment of internationally recognized governance practices with Chinese characteristics will likely slow implementation and enforcement of new environmental policies. Combined with continued inertia in using existing fossil fuel reserves, by 2030 China will be faced with significant challenges for future economic growth with a need for investment in renewable and environmentally friendly technologies to address these problems.

China is one of the nations most acutely affected by desertification today.[20] The slow onset of technology to facilitate environmentally friendly development will continue this process, resulting in further desertification and continued destruction of the ecosystem. This problem may be further exacerbated by climate change, which may be accelerated by Chinese developmental strategies.[21] The combination of this environmental degradation and China's culpability in its own environmental demise may cause humiliation and a social backlash that could risk the Mandate of Heaven claimed by the government. This could create an unstable international situation.

Economic integration between China and Taiwan combined with globalization will reduce the probability of armed conflict. Absent a full declaration of independence by Taiwan or other compelling causes, a Chinese-Taiwanese war will be increasingly unlikely in the future. In fact, should China continue to slowly open its markets and system, eventual mutual accommodation or even merger is possible.

China's economic growth will facilitate its becoming increasingly involved in regional and global humanitarian assistance efforts. China has capitalized on its abundant monetary reserves and production capacity to be the primary caretaker of the region and extend its assistance globally as well. China's use of its power for peaceful purposes will reassure regional neighbors of its harmonious intentions and secure its position as a responsible partner on the world stage.

Overall, China will be an economic superpower by 2030. Even using a conservative set of figures, its economy will likely be at

least 10 percent larger than that of the United States. Such a growth rate is rapid enough to produce a nation capable of projecting power yet slow enough to risk some internal instability. This scenario holds potentially significant challenges.[22]

China's Military in 2030

By the year 2030 China will have reaped the benefits of years of economic growth invested in a broad range of military capabilities. Aided by foreign technology to augment indigenous engineering, China will make the transition from a buyer to a developer of military systems. With a growing blue-water navy to complement a world-class air force and the world's largest army, China will grow to be a formidable military peer to the United States throughout the Southeast Asian region.

China's power projection capabilities, while rapidly growing, will still slightly lag behind the United States in this time frame. As a result, significant Chinese force projection beyond Southeast Asia will be difficult. Nonetheless, China's military will be sufficient to deter and even repel almost any attempt at preemptive action against its mainland or territories or in its immediate vicinity.

Beyond the Western Pacific, China will be a near-peer to the US military. China will be able to project some aspects of its military power beyond the region via aircraft carriers, submarines, conventional ballistic missiles, cyberspace, and space platforms. China is not likely to have an expeditionary force on par with the United States but may develop transport and tanker aircraft to extend the PLA's reach to areas where China has acquired vital interests such as the Middle East and Africa.

As China's military capabilities improve and its vital interests become more widely based, it is likely to use joint exercises to gain operational experience with potentially new partners in Asia and Africa as well as to update and test joint and combined doctrine. In addition, new tactics, techniques, and procedures will need to be developed for the assassin's mace capabilities it currently has under development.

In addition to combat operations, China may be faced with humanitarian, peacekeeping, and/or peacemaking challenges in diverse regions such as the Middle East and Africa. While building goodwill and bolstering China's international image as a growing power, the PLA will take advantage of these opportunities to rotate officers and troops through the operations to gain valuable experience, while ensuring stability for regions from which China derives economic benefits and resources. Conducting these operations will force additional innovation in force projection capabilities, as new transport capabilities and refueling aircraft will be necessary for China to logistically maintain forces forward deployed to these regions.

As China becomes wealthier, its military may morph into a higher-paid and more professional force. Coupled with a campaign to eliminate PLA-owned businesses, these changes will allow military officers to focus more on professional military education and developing their craft. Over time, these factors risk breeding a military culture of superiority, arrogance, and overconfidence in technology that increasingly advocates offensive or preemptive military strategies.

China's military capability will be greatest from the mainland out to the "second island chain"—the region extending south and east from Japan to Guam in the Western Pacific. As a regional air and naval power, China will routinely cruise these waters with its carrier strike groups, each of which will probably have a variant of the J-12 fifth-generation multirole fighters. Chinese-produced destroyers, submarines, and replenish-at-sea ships will be available to service these carriers in Chinese regional waters. By 2030 the Chinese navy will likely have at least three operational carriers. It will probably keep one in the Pacific at all times, one in port, and the other available for shows of force or exercises anywhere among the "string of pearls"—Hainan Island, through the Malacca Straits, to the Middle East, the Horn of Africa, or even the Gulf of Guinea on Africa's eastern coast. China will seek to assume the role of guarantor of the sea lines of communication in the region, including the strategic Straits of Malacca. They will also be capable of selectively impeding commerce if they choose.

As a regional military peer to the United States, the likelihood of Sino-US conflict over Taiwan will be diminished. Years of Chinese investment in antiaccess capabilities will make effective aggressive action by the United States or its allies in the Taiwan Strait extremely difficult and thus unlikely in all but the most extreme scenarios. Fifth-generation aircraft, DEWs, and world-class SAM systems will make the Taiwan Strait airspace difficult to penetrate. China's airborne and space-based ISR platforms will enable the PLA to track and target naval and air forces throughout the Western Pacific. Stand-off weapons, which include SRBM and cruise missiles—some with HPM warheads producing EMP-like effects—will be able to threaten any unhardened US forces (Army, Navy, or Air Force) operating within 1,000 km of China's shores.

China will have space warfare capability. Kinetic antisatellite weapons will be available, but the second-order effects will likely be too politically volatile to employ these weapons except in serious circumstances. China may not need to, however. Instead, it will have the ability to conduct EW denial-of-service attacks on US space systems through jamming of satellite uplinks and downlinks.

China will also have an enhanced cyberwarfare capability. China's ability to engage in computer network attacks is already well known. Over the coming years, better offensive and defensive cyber tools will probably be developed by China's military forces. This will

give the Chinese an offensive capability in cyberspace; what is not known is how willing they will be to use these capabilities. Many cyberwarfare tools (viruses, malware, etc.) are "one shot" weapons. Once used, an antivirus program can be developed to make future use of that weapon ineffective. Thus, many of these tools are prone to be saved for critical moments. Depending on what types of systems are targeted, second- and third-order effects can be hard to predict. Small effects in a power grid, for example, may have cascading consequences elsewhere. Nonetheless, despite these potential reasons to not use cyberwarfare, the Chinese will have the capability to engage in network attacks that could reasonably be expected to delay or reduce the efficiency with which the United States could deploy forces during hostilities.

By 2030 the mutual strength of the United States and China will mean that all-out hostilities would produce unacceptable economic and political consequences for both nations. Similarly, the current generation of Taiwanese leaders, while desiring to maintain some autonomy, has moved decidedly away from rhetoric regarding independence. While this may not necessarily mean a peaceful solution to the China-Taiwan issue is immediately in sight, it appears that the risk of a major China-Taiwan conflict is becoming less likely with time.

Beyond its backyard, China will grow in influence across the Indian Ocean, in the Middle East, and in Africa. The greatest threats to China's security, in the eyes of the CCP, are those that threaten access to natural resources. While China has avoided major economic disruption in its economic ascent, any disruption in the flow of still-vital oil, metals, and food would be of grave concern. China has long sought to become self-reliant in protecting its sea lines of communication and will gradually loosen the US monopoly on blue water naval forces in the Indian Ocean, off the Horn of Africa, and along Africa's west coast. In addition to patrolling the sea lanes, Chinese security forces will likely come to guard much of Africa's oil infrastructure, though probably not with formal PLA troops. These forces will not only seek to guarantee security for needed food and resources but also for the many, perhaps millions, of Chinese laborers who will own and run Chinese companies producing and mining the oil and minerals. These security needs may include Sudan and Nigeria. To protect these interests, China will likely seek opportunities for even greater control of the African security situation.

As a result of China's expanding military capabilities, there is a wider range of potential conflicts with China in the future than has been in the past. The Taiwan problem, a perennial favorite in war games, will no longer be the most likely possibility by 2030. While both the United States and China have a lot to lose in conflict with each other, conflicting resource interests in the Middle East, concerns over rare earth mineral rights in Africa, or tensions between

opposing groups in Africa are all potential sources of political discontent between the two major powers. As was stated previously, should China's leadership find itself in a deteriorating domestic situation, conflict designed to rally the citizenry around the flag could, with an expanded military, take on a myriad of forms. Further, if the cause of discontent is economic or resource based, China may have vital interests in the Middle East or Africa that could clash with similarly critical interests for the United States or its allies.

Notes

1. The reader should remember that this monograph is part of a larger study entitled *Blue Horizons*. *Blue Horizons* is, in part, a scenario-based study. The academic and strategic-planning value of using this methodology is described at length in Peter Schwartz, *The Art of the Long View* (New York, NY: Doubleday Publishers, 1991).

2. Robert E. Gamer, *Understanding Contemporary China* (Boulder, CO: Lynne Rienner Publishers, Inc., 2003), 347–48. These "burdens" will likely manifest themselves in population displacement/migration due to increased urbanization and transitions toward a manufacturing/service economy and in terms of environmental degradation that accompanies the very rapid growth that China is and will continue experiencing. Nonetheless, as shown in chapter 2, Confucianism has withstood numerous major periods of rebellion and turmoil in China from the Qin Dynasty in 221 BC to the Communist Revolution of 1949. It remains the prevalent philosophy today. Thus, it is likely to remain so over the next 30 years.

3. This recognition occurred in 2006 with the agreed-upon promotion of Cardinal Zen Ze-Kiun, bishop of Hong Kong, by Pope Benedict XVI. The Chinese government concurred with the Pope's appointment. Additional information is available from the official governmental pages of the Vatican at http://www.vatican.va/news_services/press/documentazione/documents/cardinali_biografie/cardinali_bio_zen-se-kiun_j_en.html (accessed 8 February 2009).

4. Xin-Ran Duan, "Chinese Education Enters a New Era," Academe Online, s.v., http://www.aaup.org/AAUP/pubsres/academe/2003/ND/Feat/duan.htm (accessed 27 April 2009).

5. Given the lag in per capita income, the younger generation in China in 2030 may be constrained. This may result in the masses being two to three decades behind their Western counterparts in some of these areas, though in the wealthier cities, parity is possible.

6. Goldman Sachs, *BRICs and Beyond* (New York, NY: Goldman Sachs, 2006), 47.

7. Ibid.

8. China Population Information and Research Center, "Total Population of China," http://www.cpirc.org.cn/en/totpope.htm (accessed 27 January 2009).

9. Duan, "Chinese Education Enters a New Era." This would be consistent with Hu Jintao's stated desires to improve the quality of university education in China.

10. One of the key questions for China is whether its population may need to remain employed well past the retirement ages seen in other countries. What is clear is that a socialist retirement system enabling early retirement is not compatible with China's demographic profile.

11. The fifth generation will be those who succeed Hu Jintao in 2012. As stated, this is very likely to be either Xi Jinping or Li Kiquang, two individuals who have been mentored by Hu Jintao for most of their careers. This fifth generation will control China until the early 2020s. The generation mentored by Jinping or Kiquang will be in power as China enters the year 2030—the sixth generation of leaders after Mao Zedong.

12. That these leaders will witness these events is guaranteed, as they are all under way now. The bursting of the "housing bubble" in the United States is affecting American demand for Chinese goods as this monograph is being written. Pres. Hu Jintao has already advocated environmental reforms, and the Chinese government's need to suspend manufacturing in the Beijing region during the Olympic games is tantamount to state recognition of the severity of the problem. The Eastern Turkestan Islamic Movement is a significant terrorist organization whose vicious attacks have been condemned by the US Department of State. For more on this latter issue, see http://www.state.gov/r/pa/prs/ps/2002/13403.htm (accessed 6 March 2008).

13. Goldman Sachs, *BRICs and Beyond*. India is likely to be the principal economic competitor to China in the middle of the twenty-first century. Eventually both states are expected to surpass the United States, mainly due to the size of their populations.

14. Congressional Executive Committee on China, "Senior Chinese Officials Acknowledge Rising Social Unrest, But Rule Out Political Liberalization," http://www.cecc.gov/pages/virtualAcad/index.phpd?showsingle=17209 (accessed 27 January 2009).

15. Goldman Sachs, *BRICs and Beyond*.

16. Charles W. Ostrom and Brian L. Job, "The President and the Political Use of Force," *American Political Science Review* 80, no. 2 (1986): 541–66.

17. Goldman Sachs, *BRICs and Beyond*. Goldman Sachs believes the likely range is between $11,000 and $22,000 per capita.

18. Christopher Bodeen, "Beijing in Anti-Olympic Pollution Steps," *Business Week*, 7 March 2008, http://www.businessweek.com/globalbiz/content/aug2008/gb2008081_625649.htm (accessed 27 January 2008).

19. "Hu Jintao Advocates 'Conservation Culture' for first time in Keynote Political Document," *People's Daily On-Line*, 15 October 2007, http://english.peopledaily.com.cn/90002/92169/92187/6283133.html (accessed 27 January 2009).

20. Yang Youlin, *China National Report on the Implementation of United Nations Convention to Combat Desertification and National Action Programme to Combat Desertification*, United Nations Convention to Combat Desertification, May 2000, http://www.unccd.int/cop/reports/asia/national/2000/china-summary-eng.pdf (accessed 7 March 2008).

21. Lenny Bernstein et al., *Intergovernmental Panel on Climate Change Fourth Assessment Report: Summary for Policymakers*, Intergovernmental Panel on Climate Change, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf (accessed 7 March 2008). This report clearly states that not only is China a key contributor to the problems of global warming, it is also likely to be among the regions of the world most severely affected, with temperature changes approaching one degree Fahrenheit per decade over the upcoming century.

22. The reader should note that this monograph is based on some reasonably conservative economic projections. The World Bank has a much more robust estimate of China's future growth—the China high economic line in figure 13. If this growth curve were to hold over the next 22 years, China's economy would dwarf the US economy by a margin of roughly three to one. Before discounting this possibility entirely, in two years since the World Bank made this projection, China's growth has *exceeded* that curve by nearly 7 percent. Were China to maintain this pattern of growth, it would present an entirely different set of challenges to the United States—challenges potentially on a scale where it would be very difficult for the United States to even contemplate a response.

Chapter 7

Conclusion

US Capabilities Needed to Respond to Potential Chinese Challenges

When one has finished building one's house, one suddenly realizes that in the process one has learned something that one needed to know in the worst way—before one began.

—Friedrich Nietzsche

The US military in 2030 is already largely built. Many of its most valuable systems that will be flying two decades from now are either already in the inventory or will be procured in the next few years. In all cases, they are on the drawing boards now. This chapter explores the capabilities the United States will require to compete successfully with China in 2030. The conclusions were formed via a formalized Delphi process, drawing upon 19 of the US military's foremost experts—the top 12 percent of the military's colonels and lieutenant colonels who were in the top 10 percent of their senior service school class. After analyzing all the data and using a scenario-based war game, this study has concluded that Nietzsche was right. We have learned things we needed to know in the worst way, before we began to build the military of 2030—a military already partially constructed.

The War-Game Delphi Process

The authors presented the economic, political, and cultural data to the assembled team of experts. These experts were broken into four groups; each spent time analyzing the implications of a 2030 China for the United States. The groups reconvened after finalizing their conclusions and made a report to the entire study team. After this report, multiple additional rounds of discussion and debate ensued. The results in this chapter are the outcome of this process.

There are some limitations to this process. No perfect clairvoyance of the future is possible or should be assumed. While this is the result of the combined intellect and experience of a group of highly talented and experienced senior military leaders, some concepts and capabilities described require further analysis. This team contained a broad range of expertise, but detailed knowledge of every science that lies behind every system or concept was not available. Thus, while the reader can be assured the conclusions are well grounded, further analysis on system design and concepts of operations are

appropriate for many of the recommended future concepts. This paper successfully lays the ground work for these studies.

Potential Sources of Future Conflict

The current leadership of China has made it clear that it does not seek conflict with the West either in the short or long term. Hu Jintao's repeated calls for a Harmonious Society appear to ring true. China is now tied closely to the international economy; continued economic growth seems to be a necessary (though not necessarily a sufficient) condition for internal stability, and thus China has no vested interest in creating conditions that would slow its economic growth. In fact, these ties suggest China has a strong interest in maintaining international stability. In contrast to hegemonic transition theory's usual conclusion, there does not seem to be a compelling reason to believe that China and the United States are destined to become mortal adversaries as China rises to peer status.

However, potential sources of instability in China could cause problems resulting in external conflict. One possible path would be consistent with the lateral pressure theory. First proffered by Robert C. North, Ole R. Holsti, and Nazli Choucri, the theory suggests that an increasing population and demand for resources may generate "lateral pressure" for access to resources outside the political control of the state.[1] This pressure may result in wars of expansion, though in the case of China, it would seem more likely to result in tension or conflict in a location geographically removed from either China or the US mainland. Among the resources China is expected to require in increasing quantities in the future are fossil fuels and foodstuffs. The need for food or oil could cause China, in search of its vital interests, to have these interests conflict with those of either the United States or one of its allies. In such a case, a potential cause for conflict might be present.

A potential source of conflict is problems of internal stability. China already faces tens of thousands of demonstrations against the Communist Party every year. While the CCP has been willing to expand democratic processes at low levels (e.g., municipalities), it has consistently been understood that there is but one party in China, and the CCP is always in charge.

Environmental crises and any extended periods of slow economic growth could potentially destabilize China, challenging the legitimacy of the government, its Mandate of Heaven.[2] Potentially exacerbating this problem is that in recent years China has been successful in raising the standard of living for its rural poor. Through television, radio, and travel, China's rural population has become increasingly aware of the increased wealth of China's coastal zones. Any event that constrains China's growth (whether environmental or economic) could halt China's efforts to improve the lives of its rural population, thus increasing internal stability.

Of concern is that internal instability has historically been linked to international conflict. States sometimes create conflicts for the risky purpose of uniting their people.[3] Such conflicts appear even more likely in regions where ethnic and state boundaries do not coincide. There are areas in Southeast Asia that are largely ethnic Chinese but are not part of China.

In short, the analysis suggests that without a catastrophic error in US foreign policy regarding Taiwan, any conflict with China is likely to be a proxy war in a territory off the mainland of both superpowers. Indeed, the "Taiwan Scenario," often played out in military war games, was not viewed as particularly likely in 2030 due to its capacity for escalation in ways detrimental to the interests of both major powers. Nonetheless, even in a proxy-war situation, conflict with an opponent as powerful as a 2030 China is not a trivial matter. The United States needs to bolster its capabilities to be ready for such a possibility.

Challenges Identified

Should the United States engage China in some form of hostility, China will have capabilities far beyond those of any opponent the United States has met in battle. Key areas in which Chinese technology might successfully challenge US capabilities include issues of access (deploying our forces into the region), space (both defending our assets and, if necessary, attacking theirs), cyberspace (defending both the military and civilian networked infrastructures), and in areas of newly emerging technologies such as micro- and nanoscale fibers and machines.

The first of these challenges will be China's ever-improving antiaccess capabilities. By 2030 China will probably have very long range SAMs, both surface- and ship-based, as well as DE weaponry that could make it difficult for existing mobility platforms to get to or get inside the second island chain (a line from the Marianas Islands, including Guam, across northern Australia, to the southern tip of the Malaysian peninsula). Improved naval antiaccess capability in the form of quiet submarines, hypersonic surface and ship-attack missiles, and China's own carrier battle groups would make penetrating this line difficult for the US Navy as well. Cruise and theater ballistic missiles will be able to threaten any air, sea, or ground force across this entire region. The fundamental problem is that the development cycle for these antiaccess defenses can be as little as 5–10 years, yet the timeline to develop major offensive capabilities is often as much as 20 years. If these cycles persist, antiaccess capabilities will prove more robust than the capabilities to penetrate them.[4]

China is also investing in and will likely develop an effective counterspace capability. Its recent test of an air-to-space missile is but one example. China's DE research program appears on

track to give it the ability to attack space assets with ground-based lasers before 2030, with the potential to kill satellites at least as far as medium Earth (to include Molniya) orbit and affect satellites in geosynchronous orbit. With the US doctrine requiring communications and information dominance, the prospect of having to rely on a potentially vulnerable space fleet in such a conflict was viewed as unsettling.[5]

China also seems to be developing a significant capability in the remaining Air Force domain—cyberspace. Recent attacks on US network infrastructure have been traced to China. Further, it is not only the military infrastructure that is vulnerable. As a recent Cable News Network (CNN) report showed, attacks made through the Internet can disable key infrastructure, leave the United States without a functioning utility systems, and cause permanent destruction to electric generating stations.[6] As much of the communications and transportation infrastructure of the United States is run by systems similar to those in the CNN report, the United States' ability to achieve information dominance in a conflict with China, without major advances, is doubtful. Further, the potential for cyber attacks from a well-armed cyber opponent causing lasting damage to basic US infrastructure, such as the power grid, is a major concern.

China is also heavily researching nanoscale and microscale technologies, an effort referred to as China's "Manhattan Project." This is an area where a National Science Foundation–funded study concluded that Chinese innovation has surpassed that of the United States.[7] Chinese use of microfibers and/or swarms of small vehicles to either "short out" or otherwise incapacitate electrically powered systems, including computers, weapon systems, and power grids, is a threat where there is currently no adequate defense. Certainly, use of nanoscale fibers, which are small enough to pass through existing air filters, would pose a risk to any force that attempted to deploy using anything other than overpressured, filtered facilities. An attack using larger autonomous vehicles, whether nanoscale or microscale, would require types of detection and defense mechanisms not yet devised.

What does seem certain is that even in a proxy-war setting, warfare against China would stress the military and the nation in ways not seen in recent times. Air, space, and cyberspace dominance would be called into question, and the ability to fully deploy into the region could be thwarted. US troops would have to fight their way into the area of responsibility (AOR) in a way not encountered since the island-hopping campaigns of World War II. Such a conflict would be expensive for both sides, which is why only an unusual set of circumstances, such as the need for a vital resource or the last gasp of a dying regime, would precipitate it. Yet such circumstances are possible, and for that reason, the United States needs to be prepared to respond.

Needed Capabilities for the United States to Respond

In response to these challenges, the study team compiled a list of important capabilities in which the United States should invest to attempt to maintain its dominance in the air, space, and cyberspace domains. These new capabilities include a need for responsive strategic and survivable tactical lift, the ability to roll back the Chinese integrated antiaccess systems, the ability to survive in all three domains, and the ability to go on the offensive in spite of the vast distances that span the Pacific AOR.

Lift

A survivable basing concept is the first form of responsive strategic lift that will be necessary. The Air Force will need to leverage the use of bases (whether sea or land) that can be quickly relocated to get closer to the fight. While the execution may be different, the basic concept parallels the historic example of island hopping during the World War II Pacific campaign. China's antiaccess strategies will likely initially keep US forces at arm's length—possibly as far (or farther) than Guam or northern Australia. As this antiaccess capability is rolled back, there will be a need to quickly move the basing forward to maintain offensive momentum. Some floating air base concepts, or "lily pads," may prove valuable in such a conflict if made sufficiently damage tolerant to survive attacks from missiles as well as EMP weaponry.

The second capability needed is related to the first—namely large and very fast lift capacity. Across the vast distances of the Pacific, and with China being close to many potential targets, this type of conflict may well be a race to see which side can get its forces to the battle area first. There may not be time to move forces and supplies by sea. Two concepts that appear in the operations analysis and executive summary (Walrus and Pelican) offer air-transport capabilities in the millions of pounds at speeds much higher than the fastest sealift. The ability to move whole brigades of troops or air wings in a single flight may provide a needed level of responsiveness against a powerful adversary. It may also change forever the military's lift paradigm.

Base Defense

Once lift is in place, protection of these assets and troops from what will likely be a large arsenal of advanced weapons will be required. DE and/or kinetic-kill systems are needed to disable incoming missiles and aircraft at long ranges. China will probably have missiles flying at either high supersonic or hypersonic speeds. Detection and engagement systems sufficient to kill these weapons before they strike our forces will be required.

Southeast Asia and the South Pacific are populated with many ethnic Chinese who maintain ties to their ancestral homeland. China is likely to have sympathetic individuals on the ground in and near US-occupied bases in the AOR. These individuals may be equipped with a variety of concealable weapons, including portable EMP generators as well as kinetic-attack capabilities. The ability to detect and neutralize these threats will be an essential element of base defense.

Space

The next capability required appears to be in the area of responsive space. China's recent demonstration of an antisatellite capability suggests a future need to reconstitute US space capabilities. Merely having a launch capability to space may not be sufficient. Destruction of satellites in space, depending on how it is done, can make launching new satellites into space problematic. Space debris or high-altitude radiation may need to be mitigated before new satellites can be safely launched into orbit.

Space debris can be a major survivability problem for satellites and other spacecraft. China's ASAT test left as many as 35,000 pieces of debris greater than 1 centimeter floating in space, which possibly will have long lives. These items of debris are floating at altitudes ranging from 125 miles to over 2,290 miles above the earth's surface.[8] The debris pieces are capable of doing great damage. For example, a paint fleck hit the *Challenger*, pitting the window on Sally Ride's historic mission. Had it been a little larger, it could have catastrophically ended the mission.

A marble-sized piece of debris at orbital speeds could hit a spacecraft with the equivalent force of a 1-ton safe dropped from a five-story building. The 35,000 pieces of debris from the Chinese test are larger than marble sized and have the potential to catastrophically damage satellites in their orbits.[9] As a result, if an attack on US satellites results in a debris cloud, it may be necessary to deorbit this debris or clear a launch path prior to sending up replacement satellites. This conclusion mirrors the one first presented in the 1995 *New World Vistas* study by the Air Force Scientific Advisory Board.[10] However, progress in this area over the past 13 years appears to have been slow.

If an attack on space comes from a nuclear EMP event, the residual radiation in the Van Allen belts would greatly shorten the life of any satellite launched into orbit until the high-altitude radiation was returned to normal levels. The capability to reduce high-altitude radiation may be needed should an adversary use a massive EMP attack in space, rendering large numbers of satellites unusable. The Air Force Research Laboratory (AFRL) now has a research program in the high-altitude nuclear radiation mitigation field.

Should an attack on space occur, and once the space environment is properly prepared for reconstitution of space assets, the remaining need identified is a rapid ability to repopulate space with assets providing needed capabilities. Here, satellites that can be built using a common architecture may have great value. Building a responsive system and using a common bus, in much the same way that personal computers use the same basic structure, could enable rapid manufacture of satellites to quickly restore lost capabilities. While AFRL has such a program, the estimated lifespan of these satellites is only six to 12 months. Although this time is sufficient to rapidly restore capabilities in the short term, it leaves the nation with the need for a rapid, longer-term solution. Increasing the life span of these responsively assembled satellites would be a useful area for investment, particularly in a protracted struggle with a peer competitor.

Getting the satellites to orbit is the only remaining piece of the problem. Building a satellite quickly is of value only if it can be launched quickly. To reconstitute space, responsive lift is also required. The study team believes that including reusable space launch via two-stage–to–orbit hypersonic vehicles and/or a more responsive single-stage–to–low-Earth-orbit concept is worthy of additional research and development.

The United States must also pursue increasing the survivability of space assets to attack in addition to replenishment of space assets. Newer, better methods to harden and defend space-based systems are needed. Improving in these areas, in parallel with increased replenishment capabilities, will provide a more robust space-power capability for the Air Force and the nation.

Cyberspace

In the area of cyberspace, the United States will need more robust capabilities to deal with a peer China than it has today. This study group believes the United States requires a greater ability to defend against cyber attacks and needs a robust toolkit of offensive capabilities to deter and, if necessary, defeat a well-armed adversary in cyberspace.

For the US government and the Air Force, two points must be made. First, the risk that a peer competitor might attack critical infrastructure to delay national response was seen as possible, even likely. The lack of protection of most of the US critical infrastructure, due to its private nature and the newness of the Department of Homeland Security, is worrisome. Without robust defenses against attacks for both private and governmental systems, the United States faces key vulnerabilities in cyberspace that risk not only a loss of information dominance but also the loss of the state's basic ability to provide for its citizens' needs. The Air Force's claim of the cyberspace domain means that, for better or worse, the

blame will fall upon the Air Force if such an attack upon our infrastructure succeeds.

This dual vulnerability, both military and civilian, is a key challenge. The CNN report showed that attacking power grids and other national infrastructure is possible, with potentially long-lasting effects. While deliberate attempts to permanently destroy all US electrical infrastructure are unlikely, in great part because such an attack would generate a massive US response, small perturbations in the energy infrastructure can have cascading effects. For example, a single power line sagging into trees eventually cascaded into a blackout that affected the northeast United States and southern Canada, leaving 50 million people without power in August 2003. Thus, attempts to degrade US infrastructure to delay or prevent forward deployment of forces via cyber attacks could inadvertently result in disproportionate or unintended effects. The United States needs to prevent such attacks and be able to recover quickly should they occur.

Secondly, with regard to military systems, there is a need to ensure that even if the systems are attacked, they can degrade gracefully. Networks that have numerous nodes offer multiple spare paths for information to flow when paths are interrupted. Information systems that route communications through a limited number of nodes are less robust to failure and more easily shut down. Incorporating the ability for the network to sustain attacks and continue functioning must be a priority in network upgrades and future design.

Anecdotal information suggests that the Air Force has been centralizing communications in an effort to create fewer nodes that can be more easily defended. The author concludes that this is a dangerous path to tread against a peer competitor. By reducing nodes, one simplifies the adversary's attack problem at the expense of losing flexibility. Recent attempts to protect the network by cutting the Air Force's access to it are nothing more than an attempt to achieve victory in cyberspace via the strategy of unilateral disarmament. This is not a viable long-term strategy; the Air Force must be free to harness the potential of the entire network in the future. Future networks need to be robust, flexible, adaptable, and gracefully degradable.

One challenging area that repeatedly appeared in the analysis is the need for greater cyber situational awareness. Just like the fog and friction of the physical battlefield, knowing who is where and doing what within this new domain is vital. A similar emphasis on situational awareness is under way for the space domain, and the need is no less great for the cyber domain. Attribution for actions within the domain is one of the most fundamental requirements for action. Without the ability to attribute cyber attacks, those responsible will remain hidden, slowing or even paralyzing the response.

From an offensive standpoint, the study team concluded that the United States requires an effective deterrent capability. Just as an opposing cyber force could attack US critical infrastructure, the United States needs to hold the infrastructure of its potential opponents at risk. Should the conflict proceed to cybernetic warfare, an offensive capability will be crucial. However, given the potential consequences of this type of warfare (loss of the entire electrical grid, telephone system, water supplies, etc.), it would be better if such a conflict can be deterred. This requires the creation of offensive cyber weaponry, as well as ensuring one's opponent is aware of the weapons' existence.[11]

To handle the challenges posed by a peer competitor in cyberspace, the United States needs to develop a suite of offensive and defensive cyber warfare capabilities. Further, the defensive suite needs to extend an umbrella to cover critical civilian architectures and infrastructures as well. While legal and cultural impediments to this expansion of the military role in the United States are not trivial, maintaining the government's ability to protect its citizens from attack in the information age will require the creation and institutionalization of these capabilities.

Attack

The United States must invest in offensive capabilities that can survive an extensive Chinese antiaccess strategy and its associated systems. For creating effects in the air and on the ground, the United States will need to field capabilities that are effective against defenses three to five generations newer and more capable than the most advanced adversary threat systems fielded to date.

China will have fifth- and sixth-generation fighters as capable as the F-22 and F-35 by 2030 and, possibly, small numbers of even more advanced weapon systems. To maintain air superiority, the US Air Force will need to field a fleet of fighter aircraft capable of engaging Chinese systems beyond line of sight. Given that these generations of fighters will likely incorporate low-observability characteristics, this implies the need for longer-range detection systems (whether on board the aircraft or via the network) with weapons capable of engaging opposing fighters. Because the development cycle for air-to-air missile systems has historically been much smaller than for major weapons platforms, improvements in better air-to-air missiles may pay better dividends than major purchases of a new generation of fighters beyond the F-35.

To conduct surface attack against Chinese-protected areas will require some new systems. China has a highly robust directed DE weapons program, and four years ago China was believed to have a defense laser with an over-100-kilometer range.[12] With more than 3,000 engineers working in its DEW program, it is likely this capability will be very advanced by the 2030 time frame.

It is expected that the range of China's defense systems by 2030 may exceed the unrefueled range of modern short-range fighters, risking air-refueling platforms in the early stages of a potential campaign. As a result of these factors, the study team believes that attack systems used in the first days of a 2030 conflict will need to be of markedly longer range than those of 2008 and must be able to withstand laser and microwave attacks. These systems must effectively penetrate the threat radius and directly attack the soon-to-be-fielded S-500 SAMs as well as surface-to-air threats that lie two to three generations beyond. To achieve these effects, the study team believes that long-range hypersonic missiles and/or inserted special operations forces (SOF) may be the optimum and most survivable methods of destroying or disabling these systems.

The SOF insertion requires a survivable tactical lift capability that can reasonably evade or survive in this high-threat environment. This generates a need for a new concept, and perhaps a new paradigm, in tactical lift. The participants in this study are highly skeptical of plans for a new lift platform based on the CV-22 to handle this mission set, as the radar signature of propeller-driven planes makes them unsuitable for high-threat missions. Research into how to make a vertical lift platform survivable and of low signature needs to be done.

Once China's defense network is disabled, less-capable and less-expensive systems could attack a larger target set. The initial attack systems need to be of much greater range than those presently in the field, as China's antiaccess systems will reach far enough to engage the tanker fleet at distances beyond what today's short-range fighters require. However, as with the air-to-air challenge, new weapons may be a more cost-competitive strategy than new platforms to address many of these challenges.

Areas for Further Research

The potential specter of being challenged by a peer competitor in 20 years suggests that several areas are ripe for further research. In general these include issues surrounding the technology areas of nanotechnology, DE, offensive and defensive cyber attack, and space. In addition there are some potential "wildcards," or what Peter Schwartz might call "inevitable surprises," that need to be examined. These include more strategic issues as to how the world changes if alternative energy sources become price competitive with oil or what happens if climates do change significantly. These issues may directly bear on Sino-US relations and/or conflict over the next 20–25 years.

Richard Feynman, in his famous lecture, said there was plenty of room left at the bottom. Indeed, there is much buzz on Wall Street and in various laboratories on the meaning of designer atoms. It is also known that China has a remarkable research program in

nanotechnology. Regarding this new technology, a variety of questions need to be addressed. Research on what types of nano systems will actually constitute a threat and what kinds of threats they pose is needed. Only when the threat is fully understood can one propose a research agenda or program for systems to properly address it. Much is unknown about nanotechnology's potential, in both civilian and military applications. This lack of understanding needs to be addressed.

The realm of DE continues to advance. Laser and microwave devices are increasing in power output, and research into the effects of short-pulsed lasers and microwaves is uncovering a variety of new effects. Of particular note are recent advances in solid-state lasing technology that may make miniaturized laser weaponry possible and new pulsed power sources that may make generating computer-disabling EMP easier. As with nanotechnology, further research into what threat these developments constitute is necessary. If computer systems become more vulnerable, research into how one degrades a command and control system in the absence of (or with minimal) communication capability may be required. Present doctrine assumes we will have information dominance in the future. What should doctrine look like if we do not?

The area of cyberspace may be the most poorly understood of all. The Tofflers warned us in *War and Anti-War* that societies make war in the manner in which they create wealth. Today, wealth is created from information. If the Tofflers are right, tomorrow's wars may be waged in great part with information. We now know that cyber attacks can cause physical destruction of systems. What we do not know is how vulnerable an information-based society is to these attacks. Electrical generators, like those seen destroyed by a computer hacker in the CNN report, are custom-manufactured components. They can take years to replace. The loss of enough of these would destroy the entire US power grid, sending America technologically back to the mid-1800s in the blink of an eye.

Is this threat real? Is it this massive? If so, how must our laws and working relationships change between the government and private industry to protect critical national infrastructure? What is the right way to defend the United States, and which "defense" department is responsible? These questions need answers, and in a world of increasing network interconnectivity, they need answers quickly.

Even if those questions are answered about the threat and how to structure the US government to address it, additional research is required on the specifics of how to develop appropriate cyberspace capabilities. How best does one defend from these attacks? How ought a state respond? Would destruction of a nation's power grid, banking system, water utilities, and so forth be equivalent to the use of weapons of mass destruction? What is a "proportionate response," as defined under the Geneva and Hague conventions, to

an attack that kills only systems? Our doctrine and thinking are only beginning to grapple with these issues.

Space may be the final frontier, but it can be a nasty environment. Not only is research needed in detecting, tracking, and removing space debris, fundamental questions remain regarding when and why space is the right medium for future missions. Is space more cost effective for sensing if one can distribute microsensors across a battlefield? In a world where fiber-optic cable is inexpensive, do we need space communication, or are radios and cables sufficient? As space becomes more vulnerable, is the best way to reconstitute by launching more satellites, or is it via more terrestrial methods? To answer these questions, we need to better understand the threats we face and wrestle with how easy it might be to defend against them.

The issues raised are systems centric. They ignore two major international questions that may bear on the US strategic situation more profoundly than the condition of our weapons. What happens if oil becomes obsolete? This entire monograph was written with the premise that a rapid transition away from fossil fuels would not occur in the next 22 years. Recently, oil settled at a bit less than its record price of over $145 per barrel. While prices will likely remain suppressed during the current recession, once the global economy recovers, the fundamentals of supply and demand will recreate the conditions that drove prices to these levels in 2008. If sustained high oil prices result in sudden improvements in alternative energy sources and supplies and oil cease to be cost competitive, the entire geopolitical landscape could change. What would this landscape look like? How would it affect Sino-US relations? How would it affect the Middle East and, by extension, the surrounding areas such as India and China?

The other issue is one of climate change. China is rapidly losing arable land due to desertification, as soil moisture is decreasing in areas bordering the Tibetan Plateau. If this change accelerates, what are the implications for China? Can it find the foodstuffs to feed its people, and if so, at what cost? As China transitions to become a net food importer, what are the global implications for this rising demand in foodstuffs?

These issues could easily form several new books. For now, they remain largely unresolved. They are worth exploring, and CSAT will attempt to analyze some of these in the years to come.

Summary

Nietzsche was right. When we look at the range of challenges China presents, we learn, in the worst way, several things we needed to know before our modern Air Force was built. Our current combat capabilities are relatively short range; yet, we may face an opponent with long reach. Our lift capabilities are small; yet, we

may have to quickly transit the widest and most vast ocean on Earth. Our legal framework makes it difficult for the DOD to do what its name implies—defend the civilian infrastructure from attack—in this case, from cyberspace. Our networks are being centralized when they may need to become more dispersed.

Yet this is not a world of all bad news. China does not appear to be a power that will seek war with the United States. War may happen due to the Chinese leadership's inability to handle internal stresses; however, war does not seem to be the leadership's preferred course of action. Knowing this, the United States can use diplomatic and economic tools to prevent an unnecessary onset of hostilities. However, history tells us that not all wars are preventable, and that vigilance is the price of freedom.

As we seek to build an Air Force to handle challenges in this world, increased lift, increased attack range and speed, and increased capabilities in the cyber and space domains all become precious commodities. The United States will need several capabilities to protect its interests in the world of 2030, as we must be prepared for all possible relations with China, from those of discord to those of a harmonious world.

Notes

1. Jack Levy, "The Causes of War: A Review of Theory and Evidence," in *Behavior, Society and Nuclear War*, vol. 1, edited by Philip E. Tetlock, Jo L. Husbands, Robert Jervis, Paul C. Stern, and Charles Tilly (Oxford: Oxford University Press, 1989), 258–60. Levy quotes from several 1975–76 studies by Nazli Choucri, Rovert C. North, and Ole R. Holsti wherein their findings suggest this has been a significant cause of interstate conflict.

2. Agricultural output may have already peaked, as desertification is spreading from the Mongolian Steppes and the Tibetan Plateau toward the south and east. Pollution in water and the air is continuing to rise, and while the Chinese national government has begun to take steps to address these concerns, some doubt exists as to whether the lower-level officials outside Beijing will act quickly enough to stave off a major crisis. For a full description of the range of China's environmental problems, see Elizabeth Economy, *The River Runs Black: The Environmental Challenge to China's Future* (Ithaca, NY: Cornell University Press, 2004).

3. Levy, "Causes of War," 270–72.

4. When this report was prepared, a similar study in the UK reached similar conclusions. Alex Neill, head of Asian Studies, Royal United Services Institute, indicated that China's antiaccess focus has resulted in rapid transformation of their navy and that China's military focus is to deny access into the South Asian region. Neill also argues that a nationalist takeover of military policy is a possibility and that such a takeover could result in conflict with the West. For more, see Thomas Harding, "Chinese Nuclear Submarines Prompt New 'Cold War' Warning," *London Daily Telegraph*, 3 May 2008, http://www.telegraph.co.uk/news/newstopics/uselection2008/1920917/Chinese-nuclear-submarines-prompt-%27new-Cold-War%27-warning.html (accessed 27 January 2009).

5. The surface-based communication infrastructure is no less vulnerable. The snapping of three underwater cables on 1 February 2008 by an abandoned sea anchor in the Persian Gulf cut off all Internet access to much of the Middle East. A determined opponent could cut the cables just as easily, isolating forces away from

communications. Absent cables and satellites, information dominance and command and control both become elusive concepts.

6. Jeanne Meserve, "Sources: Staged Cyber Attack Reveals Vulnerability of Power Grid," *CNN*, 26 September 2007, http://www.cnn.com/2007/US/09/26/power.at.risk/index.html.

7. Specifically, the report states that in a comparison of 33 countries, "China has replaced the U.S. at the top on Technological Standing." See Alan L. Porter, Nils C. Newman, Xiao-Yin Xin, David M. Johnson, and J. David Roessner, *High Tech Indicators: Technology-Based Competitiveness of 33 Nations 2007 Report* (Atlanta, GA: Georgia Institute of Technology, 22 January 2008), http://www.tpac.gatech.edu/hti2007/HTI2007TradReport2008mar4-wdisclaimer.pdf (accessed 27 January 2009).

8. Leonard David, "China's Anti-Satellite Test: Worrisome Debris Cloud Orbits the Earth," 2 February 2007, http://www.space.com/news/070202_china_spacedebris.html (accessed 27 January 2009).

9. "Space Debris," *Center for Defense Information*, 12 August 2005, http://www.cdi.org/program/document.cfm?DocumentID=3106 (accessed 27 January 2009).

10. Michael I. Yarymovych et al., *New World Vistas: Air and Space Power for the 21st Century Space. Applications Volume* (Washington, DC: Air Force Scientific Advisory Board, 1995).

11. In rational choices, an adversary can only take into account what he or she knows or suspects. Thus, it does no good to create a weapon for deterrence if one keeps it a total secret. For more on this form of rational choice calculus, see Martin J. Osborne, *An Introduction to Game Theory* (Oxford: Oxford University Press, 2004), 4–7. The challenge with cyber weapons is that if too much is known about a particular offensive weapon (virus, malware, etc.), defenses can be built to stop it.

12. Brian Hsu, "Defense Sector Warns of Chinese Laser Cannon Threat," *Taipei Times*, 22 December 2003, 2.

Abbreviations

AFIT	Air Force Institute of Technology
AFRL	Air Force Research Laboratory
AOR	area of responsibility
APEC	Asian-Pacific Economic Cooperation
ASAT	antisatellite
ASCM	antiship cruise missiles
ASEAN	Association of Southeast Asian Nations
AU	Air University
AWC	Air War College
BRIC	Brazil, Russia, India, and China
C4ISR	command, control, communications, computers, intelligence, surveillance, and reconnaissance
CASS	Chinese Academy of Social Sciences
CCP	Chinese Communist Party
CMC	Central Military Committee
CPC	Communist Party Congress
CPI	Corruption Perception Index
CRS	Congressional Research Service
CSAT	Center for Strategy and Technology
DE	directed energy
DEW	directed-energy weapons
DOD	Department of Defense
EMP	electromagnetic pulse
EW	electronic warfare
FDI	foreign direct investment
GDP	gross domestic product
GPS	global positioning system
HPM	high-power microwave
ICBM	intercontinental ballistic missile
IEA	International Energy Association
IMF	International Money Fund
ISR	intelligence, surveillance, and reconnaissance
IT	information technology
IW	information warfare
km	kilometer
LACM	land-attack cruise missile
MNC	multinational corporations
NGO	nongovernmental organizations
PAP	People's Action Party
PLA	People's Liberation Army
PLAAF	PLA air force
PRC	People's Republic of China
R&D	research and develoment
RMA	revolution in military affairs

ROTC	Reserve Officer Training Corps
SAASS	School of Advanced Air and Space Studies
SAM	surface-to-air missile
SCO	Shanghai Cooperation Organization
SCR	Social Corporate Responsibility
SEZ	special economic zones
SLBM	submarine-launched ballistic missile
SOF	special operations forces
SRBM	short-range ballistic missiles
tao guang yang hui	hide brightness, nourish obscurity
TFP	total factor productivity
TI	Transparency International
tuanpai	Communist Youth League
USSTRATCOM	US Strategic Command
WEO	World Energy Outlook
WTO	World Trade Organization
xiaoping	small bottles

United States Air Force
Center for Strategy and Technology

The United States Air Force (USAF) Center for Strategy and Technology (CSAT) was established at the Air War College in 1996. Its purpose is to engage in long-term strategic thinking about technology and its implications for US national security.

The center focuses on education, research, and publications that support the integration of technology into national strategy and policy. Its charter is to support faculty and student research; publish research through books, articles, and occasional papers; fund a regular program of guest speakers; and engage with collaborative research with United States and international academic institutions. As an outside funded activity, the center enjoys the support of institutions in the strategic, scientific, and technological communities.

An essential part of this program is to establish relationships with organizations in the Air Force, as well as other Department of Defense agencies and identify potential topics for research projects. Research conducted under the auspices of the center is published as Occasional Papers and disseminated to senior military and political officials, think tanks, educational institutions, and other interested parties. Through these publications, the center hopes to promote the integration of technology and strategy in support of US national security objectives.

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