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Editors

China, Engineering, and Ethics: A Sketch of the Landscape

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Dedicated to the memory of Heinz Luegenbiehl (1949–2020), at the forefront of global engineering—a teacher, mentor, and friend—and Carl Mitcham, who taught us the value of intellectual humility to a scholar and the moral obligations of being a teacher.

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Introduction

Ethics and politics are closely related. Sometimes ethical judgments oppose political actions, as when moral pacifists criticize states for waging war. Other times ethical commitments endorse or even generate political actions, as when environmental ethicists propose laws regulating pollution. One cannot escape this relationship. In the case of engineering, engineers have been known to criticize the adequacy of legal regulations (the purview of politics) in the name of professional codes (the purview of ethics). At the same time, these ethical codes are—to some degree—made possible through politics, because the state deems the kind of professional autonomy that allows for the development of codes of ethics beneficial to the public.

According to Aristotle, ethics seeks to reflect on what it means to be human, identifying ways of life that are most coordinate with human flourishing. Political philosophy considers the kinds of political order that best promotes and protects those ways of life. Similarly, according to Alasdair MacIntyre, a contemporary follower of Aristotle, any vision of human flourishing emerges within and reflects some political-philosophical tradition (MacIntyre, 1988). Ethical practices and theories are embedded in political practices and theories. Given the relationship between ethics and politics, it can be quite useful, when considering ethical practices, to have an appreciation for their political contexts.

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Political Ontologies: Individualist Versus Socialist

In the case of American engineers who want to follow professional ethical obligations in China, having knowledge of and an appreciation for the distinctive historical, cultural, and political context of China is important. Otherwise, they risk misunderstandings, which can lead to ineffective collaborations and lost opportunities.

More sensitive to this reality than Americans, French entrepreneurs and engineers have been known to seek the advice of sinologists when endeavoring to work in China. French sinologist François Jullien, for example, has served as an adviser to French business delegations in China, helping them to appreciate Chinese approaches to negotiations. He claims that "Democracy rests on one thing alone: persuasion. Whereas in China this is not the problem: there one manipulates" (quoted in De Boever, 2020, p. 70).

From its founding, the American democratic regime has privileged propositional belonging and individualism to a unique degree. The *Declaration of Independence* proclaims, "We *hold* these truths to be *self-evident*, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.—That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed" (emphasis added).

In other words, Americans are Americans because they affirm certain beliefs; these beliefs are initially *asserted* rather than argued. Americans "hold" them, in a holding that constitutes what it means to be American. It is like a profession of faith that makes an adherent a member of a religious community. Over time, Americans have tried to convince others of the truth of their faith, sometimes even to impose it on them. Initially, however, they simply asserted it as "self-evident"—although they did not apply this belief to their Black slaves or the indigenous peoples they called "Indians."

Americans also assert that individuals are more fundamental than societies or government. The basic constituents of social reality are individuals with pre-political rights; societies and government are secondary phenomena, created contractually by individuals to assure their ability to exercise those rights. As secondary phenomena, societies and governments are less respected than individuals. From their earliest days, Americans railed against governmental overreach: They resisted paying taxes and obeying laws, and they have insisted on a right to say whatever they want, unmoderated by truth-value or respect for authority—as well as a right to carry guns, to create local militias as substitutes for police forces and standing armies, to defend themselves against attacks from indigenous populations and slave rebellions.

As observers of American life such as Alexis de Tocqueville (1835/1840) have argued, Americans hold an exceptionally—and often blinkered—individualist political ontology. Cultural anthropologists such as Louis Dumont (1986) have argued that the same applies to most people in the West.

It is thus often difficult for Americans—including American engineers—to recognize and appreciate the uniqueness of their individualist political ontology. It is from this perspective of radical individualism that Americans often imagine themselves as "self-made" and "freedom loving," and are critical of any social order that could be construed as collectivist or, even worse, "socialist." In contrast to individualist political ontologies—ones that privilege individual freedom over social order—stand "socialist" political ontologies—perhaps unfortunately named, given widespread prejudices.

Expressing preferences for socialist political ontologies can strike many Americans as endorsing socialism, communism, authoritarianism, or even totalitarianism. However, there is at least one way in which a socialist political ontology is more realistic than that of an individualist political ontology. That is language. The languages people learn to speak and write exist prior to those who learn to speak and write them: The former exist prior to the latter, even while language depends for its enactment on speakers and writers.

Socialist political ontologies view human beings as parts of larger social realities, as becoming who they are as a result of the influences of the societies into which they are born and raised—just as human beings become speakers of English or French or Chinese by being born to and/or raised among those who speak English, French, or Chinese. From the perspective of social ontologies, Robinson Crusoe and the American cowboy—even the heroic engineer, inventor, and entrepreneur—are ideological myths. In reality, these radically individualist myths are created by individualists, rather than the other way around. Doing effective engineering work in China requires at least a minimal appreciation for the value Chinese place on the group and social order over and above the individual and personal freedoms.

Social Norms and Engineering Ethics

Engineering ethics in the US is supported by an individualist political ontology and its associated norms, norms that emphasize thinking in individualist terms: Acting ethically is an individualist matter.

Consider the institutional development of engineering ethics: The formation of American professional engineering societies in the mid-1800s faced resistance from individual engineers, some of whom where self-educated and had designated themselves "engineers." They did not see the need for professional organization. When engineers eventually did established professional societies, they did not much perceive the need for professional codes of ethical conduct. When codes of conduct were eventually formulated, they stressed individual and personal responsibility over common and group responsibility, and they largely abdicated any form of enforcement. Only since the 1980s have there been modest efforts to think in terms of collective professional responsibility, initially just by introducing engineering ethics into engineering curricula (Mitcham, 1987). However,

any discussion of collective responsibility runs into the headwinds of American libertarianism—except when considering how engineers should behave within corporations, where adherence to the corporate good is paramount; ironically, these corporations are often controlled by persons who imagine themselves to be rugged individualists.

The socio-political context in China—and, indeed, in most countries, including those of Europe—is different. Consequently, when working across cultural and national lines, American engineers must be cautious about assuming the individualist norms to which they are accustomed.

To begin, China is not a propositional state. One is born Chinese in a way that Americans are not. Chinese tend to recognize themselves as part of a millennial long culture and history. This affects national, political, and ethnic identities. In the US, one could be called "unamerican" based on political beliefs. In China, this makes less sense: Being "anti-communist" (*fangong*, 反共) is different from being un-Chinese (*fei huayu,* 非华语). One could cease to be American—or at least Americans think they can cease to be American—in a way that Chinese could not imagine ceasing to be Chinese.

Chinese tend to assume a more socialist political ontology—which is different from a socialist government, although it can be a basis for that—than do Americans. In a socialist political ontology society is the fundamental reality and individuals exist as members of social orders. As a result, social responsibility and respect for authority are more salient in China than the US. Although this framework has been expressed in Marxist ideological terms since the mid-twentieth century, it has existed in some form for thousands of years.

Consequently, Chinese engineering practices should be conceived in more collectivist terms. Chinese engineers often argue that the term *gongcheng* (工程), which is commonly translated as "engineering," would be better rendered as "engineering project," and that technical engineers are just part of a team that includes entrepreneurs, investors, managers, the government, and even workers and users of technology (see Li Bocong, 2021). (See Chap. 6 of this volume for an additional consideration of that term.) Traditionally, Chinese engineering was also more closely associated with civilian projects, like agricultural irrigation systems and transport canals. (See Chap. 7 of this volume for a fuller consideration and explanation of this point.) In the West, the term "engineers" originally applied to soldiers; civil engineering included "civil" to distinguish it from military activity.

The Importance of Chinese History

In a social order based on a socialist political ontology, history looms larger than in an order based on an individualist political ontology. Radical individuals don't have a history; they just have their own particular bodies and desires.

Given China's socialist political ontology, it would be well for American engineers wishing to engage with China and Chinese engineers to have an appreciation for Chinese

history, that of a civilization stretching back at least three thousand years, with a continuity uncharacteristic of the West. In the West, history is broken apart into ancient, medieval, and modern, with radical ruptures in continuity. American history is wholly modern, spanning a period just over 200 years, the time period of short Chinese dynasties. But there were many Chinese dynasties, some of them twice as long.

China's history has breaks too, as dynasties rise and fall, but the creation of a new dynasty always re-establishes some continuity with its predecessors. There is a continuity to Chinese culture across its history that is lacking in the West. Even though Chinese dynasties fall, the falling and rising of dynasties are viewed as natural processes. "The empire long divided, must unite; long united, it must divide. Thus it has ever been," is the opening of the *Romance of the Three Kingdoms*, a fourteenth century Chinese novel about 3rd-century historical events.

Although a full history of China is well beyond the scope of this chapter, a skeletal account of modern Chinese history—the period in which engineering in the modern Western sense comes to play an increasingly prominent and powerful role—can be helpful.

Modern Chinese history can conveniently be charted from the imperial encroachment of Western powers beginning with the Opium Wars of the 1840s. When China objected to the British demand to import and market opium, Great Britain deployed its military and navel engineering might to attack, forcing China to cede Hong Kong as a trading port. The following "century of humiliation" was marked by repeated attacks by Western powers, including Portugal, France, Germany, the US—and eventually Japan—leading to the collapse of the Qing Dynasty (1644–1911) and proclamation of the Republic of China (ROC, the first leaders of which are called the "Nationalists").

From 1912 to 1937, humiliation continued in the form of further interference in Chinese affairs by various Western commercial and political interests, as well as internal struggles between various warlord factions. In 1937, after first establishing a puppet state in northeastern China in 1931, Japan launched a full-scale invasion. From 1937 to 1945, China was the central site for the Asian theater of World War II. Just as the Soviet Union bore the brunt of the German *Wehrmacht*, so China bore the brunt of the Japanese Imperial Army.

When World War II ended, civil war broke out between Communists, led by Mao Zedong and backed by the Soviet Union, and Nationalists, led by Jiang Kai-shek and backed by the US. When it became clear that the Nationalists were going to lose the civil war, the US intervened to help establish a rump government on the island of Taiwan, with the aim of eventually returning to conquer the mainland. For the next thirty years, it tried to isolate the People's Republic of China (PRC), the government established by Mao Zedong and the communists in mainland China.

In 1949, when Mao proclaimed the success of the Communist Revolution, he famously declared, "The Chinese people have stood up." But the next thirty years was a period of continued suffering and hardship. During the Great Leap Foreword (1958–1962) and

Cultural Revolution (1966–1976) tens of millions of Chinese died because of internal strife.

The China watcher Elizabeth Economy (2021) parses the history of the PRC into three regimes, each characterized by substantial internal shifts in orientation, which she also styles "revolutions": that of Mao (1949–1976), Deng Xiaoping (1978–2012), and now Xi Jinping (2013-present). Deng was the paramount leader who greatly stimulated the rise of China as an engineering behemoth. At the height of the Deng regime, American visitors could be forgiven for feeling like they had stepped back into the post-Civil War era of industrialization. Another China watcher, David Schambaugh (2021) has identified more subtle changes during the Deng era, from the economic pragmatism of Deng himself through the two Deng-selected leaders: the bureaucratic manipulator Jiang Zemin and the technocratic Hu Jintao. Xi Jinping is the first post-Deng leader, that is, a General Secretary of the Communist Party of China (CPC) who was not selected or approved by Deng.

Again, Elizabeth Economy describes Xi as bringing about a "third revolution" in contemporary Chinese political culture, what Xi has called the "Chinese Dream" (*Zhongguo meng,* 中国梦). Xi has been "careful to distinguish the Chinese Dream, rooted in collective values, from the more individualistic American Dream, noting that the great rejuvenation of the Chinese nation 'is a dream of the whole nation, as well as of every individual,' and that 'only when the country does well, and the nation does well, can every person do well'" (Economy, 2021, p. 4).

Salient characteristics of the Xi revolution, which reflect a traditional Chinese political ontology, include: a "dramatic centralization of authority under his personal leadership; the intensified penetration of society by the state; the creation of a virtual wall of regulations and restrictions that more tightly controls the flow of ideas, culture, and capital into and out of the country; and the significant projection of Chinese power" (Economy, 2021, p. 10). Xi has further sponsored what Fudan University philosophy professor Wu Xiaoming (2021) calls a "self-assertion of Chinese academia and Marxist philosophy."

Any efforts at bridging Chinese and American theory and practice in engineering ethics would benefit from an awareness of the substantial differences underlying their respective political ontologies.

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