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FROM COLLABORATION TO CONTROVERSY:

The Origins of the 1979 U.S.-PRC Science & Technology Cooperation Agreement

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The 1979 Science & Technology Cooperation Agreement (STA) was the first major agreement between the United States and the People's Republic of China. Signed during Deng Xiaoping's January visit to the U.S. to establish diplomatic relations, it was a general framework agreement for conducting technical and scientific exchange. The framework agreement was renewed every five years, with interruptions in 2016–2018 during the negotiation of an intellectual property annex and again in 2023 when it received two six-month extensions. As of this writing, its renewal remains uncertain, as it formally expired in August 2024. Recent commentary indicates that a renewal is likely, perhaps after the presidential election, and in a more limited format that includes areas like climate research and public health but excludes sensitive topics like artificial intelligence (AI) or quantum computing.[1]

How did a bilateral agreement that was embraced by both sides, was widely believed to be mutually beneficial and has weathered the ups and downs of the relationship for over four decades suddenly find itself in limbo? What has changed in both sides' perception of the STA that has led to the current situation? Should the U.S. seek to renew the STA or abandon it for something else? In this paper, we return to the origins of the STA in hopes of finding some answers to these questions.

For most of the 45 years of its existence, the STA was widely recognized as a beneficial element of the Sino-U.S. relationship, though some U.S. policymakers have always expressed concerns about certain aspects of it. Today, it is the subject of widespread criticism in the U.S. Concerns range from military applications of scientific research, to the lack of transparency in the Chinese system of science, to the rights and protections of U.S. researchers working in China. In fact, all these issues have weighed on policymakers' minds since the agreement's inception, but the two sides found ways to negotiate their differences. As a result, the world's largest science and technology (S&T) relationship has flourished over the last half-century. American political leaders may have expressed *concerns* about the STA in the early decades of its existence, but they did not think that the agreement itself was *controversial* — that is, those same leaders did not suggest that the U.S. should not renew the agreement. They always saw benefits for the U.S., even though those benefits changed over time.

The three sections of this paper offer three historical insights into today's STA controversy. **1) The Path to Sino-U.S. Science Collaboration**: The STA was the first major agreement between the U.S. and PRC because science collaboration was politically safe at a time when the relationship was fragile. In today's fraught relationship, it can serve the same function it served then, helping the two sides consolidate ties and understand each other. A more limited scope might even allow it to better fill this function by avoiding sensitive topics. **2) U.S. Interest in Sino-American Science Exchange**: The U.S. derived a changing set of benefits from the STA, from strategic security advantages to technology sales. Still, from the beginning, U.S. officials recognized that China had much to contribute to global science. Today, U.S. scientists have even more to learn from Chinese scientists, but collaboration has declined since the COVID-19 pandemic. Renewing the STA would demonstrate U.S. investment in building the relationship. **3) Concerns and Limitations**: There have always been concerns and limitations around U.S.-PRC science collaboration, but the STA itself has never been the source of those problems, and changing it will not eliminate them. For example, export restrictions on sensitive technologies changed as the U.S. became comfortable sharing certain dual-use or advanced technologies with China. These changes impacted what was possible under the auspices of the STA, though the agreement itself did not change. Similarly, targeted legislation and regulation in areas like AI or quantum computing can establish

1 Natasha Gilbert and Smriti Mallapaty, "U.S. and China Inch towards Renewing Science-Cooperation Pact — despite Tensions," *Nature* 633, no. 8030 (September 10, 2024): 499–500.

boundaries that shape how the STA and its sub-agreements are implemented.

1) The Path to Sino-U.S. Science Collaboration

***Overview*:** *The STA was created at a time when U.S.-PRC connections were fragile and the PRC was seeking greater integration into the U.S.-led global economy. The STA was one of several S&T agreements China signed with western countries around the same time, and one theme running through these agreements was China's desire for autonomy and consistency in its international relations.*

In the 1970s, scientists and researchers in China and the U.S. played a prominent role in the bilateral relationship prior to normalization of diplomatic relations for the simple reason that the governments could not.[2] Historian Kazushi Minami has noted that Washington policymakers may have been the "architects" of the Sino-American rapprochement, but "they were not the carpenters."[3] Richard Nixon and Zhou Enlai cleared the biggest hurdle for greater U.S.-PRC interaction when they signed the Shanghai Communiqué in 1972. After that, small, informal scholarly exchanges expanded as a safe and neutral way to build mutual understanding. Then, as today, different groups in the U.S. had varying reasons for wanting science collaboration with China. These included members of the U.S. government as well as individual researchers and university leadership. In China, dramatic shifts in domestic politics had set the stage for a new emphasis on science internally. The Cultural Revolution (1966–1976) had ravaged Chinese science and higher education, and years of infighting among Chinese Communist Party (CCP) leadership convulsed the nation as science was politicized in factional struggles. Leftists condemned meritocratic education and labeled as traitors those who sought contact with foreigners. After the death of Mao Zedong in 1976, Hua Guofeng's premiership brought tentative shifts, but it was Deng Xiaoping's growing influence in the late 1970s that finally opened the door for significant contacts.[4] Science and technology featured prominently in Deng's vision for economic revitalization, and S&T agreements with more scientifically advanced nations were a crucial tool for realizing his aims.

In the U.S., Richard Nixon's 1973 impeachment delayed the progress of the Sino-American rapprochement, but by the spring of 1978 the two sides were moving rapidly toward normalizing their relations. Within Jimmy Carter's administration (1977–1981), National Security Advisor Zbigniew Brzezinski pushed to strengthen U.S. ties with China as part of a geopolitical strategy to weaken the Soviet Union.[5] The administration saw China's scientific and technological advancement as geopolitically beneficial to the U.S.: a technologically strong and modern China presented a

2 Small-scale exchanges in the 1970s have been the subject of a number of scholarly works. Important contributions include: Kathlin Smith, "The Role of Scientists in Normalizing U.S.-China Relations: 1965–1979," *Annals of the New York Academy of Sciences* 866, no. 1 (December 1998): 114–36; Pete Millwood, *Improbable Diplomats: How Ping-Pong Players, Musicians, and Scientists Remade U.S.-China Relations* (Cambridge: Cambridge University Press, 2022); Minami, *People's Diplomacy*.

3 Kazushi Minami, *People's Diplomacy: How Americans and Chinese Transformed U.S.-China Relations during the Cold War* (Ithaca: Cornell University Press, 2024), 3.

4 Li Jie, "China's Domestic Politics and the Normalization of Sino-U.S. Relations, 1969-1979" in William C. Kirby, Robert S. Ross, and Li Gong, eds., *Normalization of U.S.-China Relations: An International History* (Cambridge: Harvard University Asia Center, 2005), 56–89; Ezra F. Vogel, *Deng Xiaoping and the Transformation of China* (Cambridge: Harvard University Press, 2011), 217–373.

5 John Dumbrell, *American Foreign Policy: Carter to Clinton* (New York: St. Martin's Press, 1997), 45–46; James Mann, *About Face: A History of America's Curious Relationship with China, from Nixon to Clinton* (New York: Alfred Knopf, 1999), 96–114; Patrick Tyler, *A Great Wall: Six Presidents and China: An Investigative History* (New York: PublicAffairs, 2000), 227–86; Daniel Sargent, *A Superpower Transformed: The Remaking of American Foreign Relations in the 1970s* (Oxford: Oxford University Press, 2015), 270–72.

more effective bulwark to the USSR.[6]

The Carter administration thus placed extraordinary significance on science and technology relations with China. In May 1978, Brzezinski traveled to Beijing, a turning point on the path to normalization.[7] As a next step, Carter's science advisor, Frank Press, led a delegation to visit Beijing in July. The delegation discussed possible areas of S&T collaboration, laying the first foundations of the STA.[8] Carter had increased his science advisor's political importance; the position had been abolished under Nixon and restored only in the waning days of the Ford administration.[9] The Press delegation was the highest-ranking U.S. delegation to visit the PRC under Carter thus far. The Chinese also attached great importance to the visit by the U.S. science delegation. Han Xu, first deputy chief of the Chinese Liaison Office in Washington, D.C., considered the Press delegation to be the second most important he had ever arranged, ranking only behind the Brzezinski trip.[10]

The Press delegation embodied the variety of interests that drove the S&T collaboration forward. Geopolitics might have launched the new relationship with PRC at the highest level, but explicit geopolitical considerations were certainly not the primary interest of most members of the first science delegation. It included the heads of scientific organizations such as NASA, the National Science Foundation and the National Institutes of Health, as well as the assistant secretaries of agriculture and commerce. Richard Atkinson, head of the National Science Foundation, took part in the delegation and would later sign the first sub-agreement on education exchange.[11] For him, neither anti-Soviet geopolitical maneuvering nor economic competition were on his mind as a pioneer of Sino-U.S. science exchange: "We really believed that international science cooperation was just a good thing."[12]

In the fall of 1978, representatives of the Carter administration, alongside their Chinese counterparts, negotiated the frameworks of what would become the STA's first sub-agreements. The U.S. and the Chinese government differed over the timeline for expanding S&T collaboration. While the U.S. side viewed science as an uncontroversial tool for strengthening ties, CCP leadership, in contrast, viewed science collaboration as something that could only flourish after normalization. Their surprising reluctance can be attributed to their desire to secure American concessions on Taiwan. Furthermore, scientific assistance and technologies were available from other Western countries with whom they had already established diplomatic

6 Michael Armacost to Brzezinski, 1 Mar 1978, Armacost Evening and Weekly Reports File, 3-4/78, NSA, Staff Material – Far East – Armacost, Evening and Weekly Reports File/Chron File, Box 1, Jimmy Carter Library (JCL). The historian of science Zuoyue Wang and the political scientist Richard Suttmeier have written prolifically about the Sino-U.S. science relationship. Relevant to this report, see especially: Zuoyue Wang, "U.S.-China Scientific Exchange: A Case Study of State-Sponsored Scientific Internationalism during the Cold War and Beyond," *Historical Studies in the Physical and Biological Sciences* 30, no. 1 (1999): 249–77; Richard Suttmeier, "Scientific Cooperation and Conflict Management in U.S.–China Relations from 1978 to the Present," *Annals of the New York Academy of Sciences* 866, no. 1 (December 1998): 137–64; For a good Chinese overview of the politics of science and technology cooperation in the Carter administration, see: 熊晨曦 Xiong Chenxi, "一九七〇年代末期美国政府对华科技合作政策的形成 The Development of U.S. Science and Technology Cooperation Policy with China in the Late 1970s," 党史研究与教学, no. 1 (2021): 76–86.

7 Zbigniew Brzezinski, *Power and Principle: Memoirs of the National Security Adviser, 1977-1981* (New York: Farrar, Straus, Giroux, 1983), 209–33.

8 Millwood, *Improbable Diplomats*, 267–311.

9 Eliot Marshall, "Frank Press and Congress," *Science* 204, no. 4388 (April 6, 1979): 37–41.

10 阮虹 Ruan Hong, 韩叙传 *Biography of Han Xu* (Beijing: Shijie zhishi Chubanshe, 2004), 201.

11 Richard Atkinson, "Recollections of Events Leading to the First Exchange of Students, Scholars and Scientists between the United States and the People's Republic of China," 2006.

12 Interview with Richard Atkinson, San Diego, 15 January 2024.

relations.[13] It is thus one of the ironies of the Sino-U.S. relationship that the PRC, which had more to gain from S&T collaboration at that time, made it conditional on normalization of diplomatic relations, while the U.S. did not.

The U.S.-PRC STA was one of many science and technology agreements that the PRC signed with countries around the world as part of its modernization drive at the time. In fact, the one signed with the U.S. was modeled on the PRC's other agreements.[14] The first such agreement with a Western nation was signed with France in January 1978. Its text was drafted by the PRC, its first agreement with a Western nation to be written by the Chinese side.[15] A similar West German agreement was signed in October 1978.[16] On January 1, 1979, the Chinese sent their U.S. counterparts a draft that closely resembled the French and West German agreements.[17] On January 3 the U.S. side sent its counter-draft, which incorporated much of the Chinese original while expanding in several places. The Americans specified seven areas of collaboration: agriculture, energy, space, health, environment, earth sciences and engineering. The Chinese resisted U.S. insertions about intellectual property, which they correctly pointed out had no basis in Chinese law at the time, and they also questioned guidelines about who should pay for exchanges.[18]

In exchanges with West Germany and the U.S., the Chinese negotiators expressed their desire for the agreement to be similar to the ones they had signed with other nations, saying that their draft "represents consistent Chinese practice."[19] This insistence on consistency in its science agreements likely reflected the CCP's desire to maintain its independence by not relying too much on any one nation as well as a certain rigidity and anxiety that accompanied its opening to the world. It also meant that agreements tended to be shaped by Chinese customs and preferences, not those of their partners. This may explain why the 1979 U.S.-China agreement differs from the typical language of the U.S.'s other science and technology agreements, which tend to more narrowly cover government-to-government exchange.[20] The Chinese emphasis on consistency across its international science agreements and the uncertainty of the new

13 Telegram PEKING 00044, U.S. Liaison Office Beijing to Secretary of State, Jan. 5, 1978, General Records of the Department of State, Central Foreign Policy Files (hereafter CPFP), 1973-1979/ Electronic Telegrams, Record Group (hereafter RG) 59, National Archives (Hereafter USNA), (accessed May 2, 2024 at http://www.archives.gov). On the history of negotiations around the Taiwan issue, see: Robert S. Ross, *Negotiating Cooperation: The United States and China, 1969-1989* (Stanford: Stanford University press, 1995).

14 The STA is so closely associated with Sino-U.S. normalization that it is basically discussed as a byproduct of it. But the PRC had had diplomatic relations with France since 1964 and West Germany since 1972, yet it only signed STAs with both in 1978. In other words, diplomatic relations were a necessary but not a sufficient cause for an STA. The true impetus was China's Reform and Opening.

15 "Regierungsabkommen…hier: Ressortbesprechung," Bundesministerium für Forschung und Technologie, 25 Apr. 1978, B 196/12202, German Federal Archives Koblenz (Hereafter: BArch).

16 FRG Beijing Embassy to Foreign Ministry, "Deutscher Gegenentwurf…hier: Chinesische Stellungnahme," Aug. 24, 1978, B 196/12202, BArch.

17 Telegram Peking 00002, U.S. Liaison Office Beijing to Secretary of State, 1 Jan. 1979, CPFP, 1973–1979/ Electronic Telegrams, RG 59, USNA, (accessed May 2, 2024 at http://www.archives.gov).

18 Telegram Peking 00122, U.S. Liaison Office Beijing to Secretary of State, 8 Jan. 1979, CPFP, 1973–1979/ Electronic Telegrams, RG 59, USNA, (accessed May 3, 2024 at http://www.archives.gov).

19 FRG Beijing embassy to Foreign Ministry, "Deutscher Gegenentwurf…hier: Chinesische Stellungnahme," Aug. 24, 1978, B 196/12202, BArch; Telegram Peking 00093, U.S.L.O. Beijing to Secretary of State, Jan 8, 1979, CPFP, 1973–1979/ Electronic Telegrams, RG 59, USNA, (accessed May 3, 2024 at http://www.archives.gov).

20 For example, Thailand's 2013 S&T agreement specifies that it covers "major government-sponsored or government-supported programs." "Scientific Cooperation Agreement Between the United States of America and Thailand," *Treaties and Other International Acts Series* (hereafter *TIAS*), August 6, 2013, https://www.state.gov/13-806.

relationship meant that room for real negotiation in the STA existed primarily in its sub-agreements, which remains true today. The general STA agreement is an umbrella document that serves a lofty political purpose, but the devil is in the details hammered out in its sub-agreements, with the backing of concrete constituencies in both countries.

2) U.S. Interest in Sino-American Science Exchange

Overview: *Gaining advantage against the Soviet Union by strengthening China was key to the U.S. policymakers' considerations in defining the U.S. scientific relationship with the PRC in the 1970s. Science exchange was also a way to demonstrate goodwill in the fledgling relationship. Although the PRC lagged far behind the U.S. in science, S&T collaboration offered secondary benefits to the United States: sales of expensive technology to China and access to Chinese oil, for example. By 1987, the Reagan administration found that the U.S. was gaining direct scientific benefits from the collaboration, not merely secondary economic or strategic ones.*

Geopolitical strategy, sometimes referred to as "playing the China card" against the USSR, was an important motivation for the U.S. to support China's technological modernization. Sino-Soviet relations had deteriorated since the late 1950s, escalating into armed border skirmishes by 1969.[21] China's new strategic focus on its northern border drew U.S. attention to the important role the PRC could play in countering the USSR. For the PRC, increasing hostilities with the USSR made rapprochement with the U.S. appealing because it alleviated fears of being attacked by two powerful enemies at once.[22] Thus, common strategic interests fostered a closer S&T relationship between the U.S. and PRC. While the U.S. side tended to accommodate Chinese desires, PRC leaders viewed the STA as an important vehicle for them to achieve domestic modernization goals.

Still, from the outset, the U.S. side had many other reasons to pursue collaboration with the PRC. In the spring of 1979, Benjamin Huberman, associate director of the Office of Science and Technology Policy, explained, "the United States has had multiple motivations for entering into such relationships." These included smoothing the path to normalization and building relationships with future leaders of China, but also competitive ones related to technology sales and resource extraction: "By strengthening ties in important sectors such as agriculture, energy resource development and space technology, they will enable us to compete much more easily in an expanding commercial market. They will enhance Chinese agriculture and facilitate the development and export of their energy and mineral resources."[23]

Since the PRC had little advanced science to offer the United States in the 1970s, Sino-American science collaboration in those early days has sometimes been depicted as a mere bargaining chip, nearly without direct advantage for the U.S. Nonetheless, those responsible for developing the agreement saw concrete benefits. In the short term, there were economic gains associated with PRC government purchases of Western technology. As part of its early attempt to modernize, China was on a buying spree of advanced technology and industrial equipment through the end of 1978, based on a faulty estimate of its oil reserves. By the end of 1978, it was clear to Chinese leadership that their plans were untenable, and they charted a new course with more emphasis on light manufacturing that was both less costly and less

21 Danhui Li and Yafeng Xia, *Mao and the Sino-Soviet Split, 1959-1973: A New History* (Lanham: Lexington Books, 2018), 233–272.

22 Wang Zhongchun, "The Soviet Factor in Sino-American Normalization, 1969–1979," in Kirby, Ross, and Gong, *Normalization of U.S.-China Relations*, 147–174.

23 Benjamin Huberman, Statement before the Subcommittee on Science, Research and Technology, House Committee on Science and Technology, 7 May 1979, 1.02: U.S.-PRC S+T Relations – General 1979, China Agreement on Scientific and Technical Cooperation, 1978-1980, Bureau of Oceans and International Environmental and Scientific Affairs, RG 59, National Archives at College Park (hereafter: NACP).

energy intensive.[24] Nevertheless, the scale of China's modernization still carried an astronomical price tag.

Until 1979, the U.S. was at a disadvantage compared to other advanced economies when it came to technology sales to China. It was clear to American policymakers that the delayed establishment of diplomatic relations had restricted U.S. technology exports.[25] Because the two countries still lacked diplomatic relations, the U.S. was a seller of last resort for the Chinese. It trailed its European allies in technology sales to the PRC.[26] Even after diplomatic normalization, in late 1979, the U.S. lagged behind France, Japan, England, West Germany, Canada and Italy in credits given to the PRC to buy advanced technology, in each case by billions of dollars.[27] If the U.S. did not cooperate with China on S&T, other countries would grow rich and gain influence at the expense of the U.S.

In the late 1970s, anxieties ran high among the leadership of U.S. scientific institutions that America was losing the preeminent status in science that it had enjoyed in the immediate postwar years.[28] At the same time, stagflation and oil prices weighed on the economy and American confidence.[29] The STA offered a means of fortifying America's economic and scientific standing by spreading American scientific influence as well as through direct technology sales such as those associated with the satellite collaboration. It also offered less direct, but probably more significant, paths to more technology sales in the future. The PRC had difficulty absorbing imported technologies because it lacked educated technicians to operate them. For this reason, the training offered as part of the STA cleared the path for China to purchase American technology.[30] Technology sales were a common motivation for Western nations to undertake S&T exchanges with China in the late 1970s. "The chief objective of our scientific exchanges with China is, with the exception of certain limited and specific sectors, to clear the path for export of the most sophisticated technologies possible," commented Claude Martin, French ambassador to the PRC, in 1977.[31]

Access to Chinese oil also factored into U.S. interest in S&T collaboration, though Chinese oil reserves ultimately proved smaller than hoped. Discussions of the energy sub-agreement revolved around increasing Chinese oil and coal extraction as well as expanding

24 Barry Naughton, *Growing out of the Plan: Chinese Economic Reform, 1978-1993* (Cambridge: Cambridge University Press, 2003), 69–76.

25 U.S. Congress, House, *Technology Transfer to China: Hearings before the Subcommittee on Science, Research, and Technology and the Subcommittee on Investigations and Oversight of the Committee on Science and Technology*, 96th Cong., 1st sess., Nov 13, 1979, p. 13.

26 Armacost to Brzezinski, 9 Feb 1978, Armacost Evening and Weekly Reports File, 1-2/78, NSA, Staff Material – Far East – Armacost, Evening and Weekly Reports File/Chron File, Box 1, Jimmy Carter Presidential Library (hereafter JCL).

27 "Bundesbürgschaften für Ausfuhrgeschäfte der VR China," Federal Ministry of Economics to Federal Chancellery, 28 Sept. 1979, B 136/18570, BArch.

28 Interview with Richard Atkinson, 15 January 2024.

29 Daniel J. Sargent, "The United States and Globalization in the 1970s" in Niall Ferguson, ed., *The Shock of the Global: The 1970s in Perspective* (Cambridge, MA: Harvard University Press, 2010), 41–64; David S. Painter, "Oil and Geopolitics: The Oil Crises of the 1970s and the Cold War," *Historical Social Research / Historische Sozialforschung* 39, no. 4 (2014): 186–208; Fiona Venn, *The Oil Crisis* (London: Longman, 2002); Meg Jacobs, *Panic at the Pump: The Energy Crisis and the Transformation of American Politics in the 1970s* (New York: Hill and Wang, 2016).

30 E.g. CIA, "China's Foreign Trade and Economic Relations" p. 15, May 1978, Press (Frank) 7/78 Trip to China: 11/75-5/78, box 59, NSA Staff Material—Far East Oksenberg, Subject File, JCL.

31 Quoted in Xilin Huang, "La diplomatie scientifique française en Chine : vers la « co-construction » d'une politique étrangère," *Monde chinois* N° 59, no. 3 (January 31, 2020): 89, note 16.

its solar, hydroelectric and nuclear power supply.[32] These were scientific questions that found expression under the umbrella of the STA, but in the context of high oil prices and fear about global oil supply, they also reflected U.S. economic and security interests. Though the U.S. was rightly skeptical of the PRC's high estimates of its oil reserves, their true extent, especially offshore, was unknown. Many remained hopeful for at least moderate export capacity. U.S. ascendancy in offshore drilling technology made it an attractive partner for China.[33] In the late 1970s, Chinese oil prospects were frequently mentioned in top-level National Security Council documents.[34]

Today, as in 1979, the STA is mostly associated with cutting-edge science and public research institutions. But Americans in the early 1980s also emphasized training and assistance in areas that we might now see as belonging more properly to industry or commerce, from mineral prospecting to agricultural modernization to training Chinese technicians. Under the auspices of the STA, the Chinese government asked the U.S. government to facilitate the work of U.S. firms in China.[35] A 1984 U.S. assessment of the agreement's five-year anniversary concluded that the Dalian School of Management (established 1980) was the "flagship" of the Sino-U.S. S&T collaboration thus far.[36] This was in line with Chinese priorities; its planners had emphasized the need to modernize PRC management.[37] From the U.S. point of view, the appeal lay in training a new generation of managers in a country whose leaders had long been hostile to the U.S.

The benefit to American scientific research also became rapidly clear, both in terms of learning from Chinese scientists and the significant infusion of Chinese scientific talent into the U.S. research enterprise. Looking back on the beginnings of the Sino-U.S. S&T relationship in 1987, Reagan's Office of Science and Technology Policy wrote: "Over the past eight years, experience from this extensive S&T interaction has shown that there is considerable U.S. scientific benefit to be derived from collaboration with China… Initially, the [U.S. government] participating agencies tended to discount or minimize the S&T advantages that could accrue to the U.S. from this interaction and devoted less attention to promoting U.S. interests and needs than to meeting Chinese priorities and objectives."[38] China's potential to contribute directly to the development of American and international science had become clear.

3. Concerns and Limitations

Overview: *After the STA had been signed, congressional hearings put forward a range of concerns about its implementation, from potential infringement on the rights of American researchers to possible long-term*

32 Telegram State 266200, Secretary of State to U.S.L.O. Beijing, 20 Oct 1978, CPFP, 1973–1979/ Electronic Telegrams, RG 59, USNA, (accessed May 3, 2024 at http://www.archives.gov).

33 Kazushi Minami, "Oil for the Lamps of America? Sino-American Oil Diplomacy, 1973–1979," *Diplomatic History* 41, no. 5 (November 1, 2017): 959–84.

34 E.g. Brzezinski to Carter, 9 June 1978, Weekly Reports (to the President), 61-71 (6/78–9/78), Donated Zbigniew Brzezinski Collection, Box 41, JCL. On U.S. versus PRC estimates, see "China Oil Production Prospects," CIA, 1977, Staff Offices Press Powell, Box 54, JCL.

35 E.g. "Chinese S&T Book: Coal," p. 18, PRC Energy 1978, RG 59, Bureau of Oceans and International Environmental and Scientific Affairs, China Agreement on Scientific and Technical Cooperation, 1978–1980, Box 1, NACP.

36 "The U.S. Role in the Dalian Management Training Center," 1986, OSTP 1987–88 China, RG 0359, General Records 1976–2001, container 3, NACP.

37 中国人民解放军高级将领传 *Biographies of High-Ranking Generals in the People's Liberation Army* (Beijing: Jiefangjun chubanshe, 2013), 300. See also Julian Gewirz, *Unlikely Partners: Chinese Reformers, Western Economists, and the Making of Global China* (Cambridge, MA: Harvard University Press, 2017).

38 "The U.S.-China S&T Relationship: Evolving National Interest and Policy Issues," p. 2, China OSTP 1987–88, RG 0359, Office of the Director, Entry # P2: General Records 1976–2001, NACP.

loss of U.S. jobs. However, the rewards of collaboration were deemed to outweigh the risks. It was recognized that the U.S. could not hold back China's development since the PRC could collaborate with many countries, nor was it considered advantageous to try. Concerns about dual-use technologies posed the biggest problem for early U.S.-PRC S&T cooperation, but the issue is not directly addressed in the STA.

In general, the early STA was not controversial. Politicians on both sides of the aisle were aware of potential dangers, but even pessimistic assessments favored collaboration. For example, despite an atmosphere of growing trust and enthusiasm, top-level leadership doubted that China's friendship with the West would last. Commenting on a major Chinese science conference held in spring 1978, Brzezinski noted: "It is worth remembering that on several occasions — the 1880's, the early 1900's, the 1930's, and the mid-1950's — the Chinese seemed equally infatuated with Western definitions and approaches to development. Each surge of Western influence was followed… by periods of social unrest and xenophobia. The policy challenge we confront is to respond effectively to China's most recent turn to the West. In short, we enjoy a 'window' in China."[39] Nonetheless, there was consensus in the late 1970s and 1980s that the best way to use that window was to collaborate with the Chinese.

One exception to the "what's good for China is good for the U.S." mentality that characterized early STA discussions was export controls on sensitive technologies.[40] As today, U.S. government officials in 1979 were concerned about military applications of U.S. science and technology transferred to China. At the time, it was considered dangerous to sell dual-use technologies to the Chinese because it could upset Soviet leadership and because China might sell technology to an unapproved third party such as Pakistan.[41] Despite these concerns, certain technologies with clear military applications such as communications satellites were approved.[42]

The STA itself did not reduce restrictions on technology transfer. Technology restrictions were already subject to approval by U.S. government agencies and the Coordinating Committee for Multilateral Export Controls (CoCom), a group of Western countries that maintained restrictions on the export of high technology. Certain STA sub-agreements required separate and specific consideration of export controls, such as the collaborations on communications satellites and nuclear energy.[43] Export licenses were determined on a case-by-case basis, and the Chinese as well as their American counterparts complained about long wait times and uncertain outcomes.[44] It was not until 1981 that the U.S. made a first attempt to ease export restrictions to the PRC, when the Reagan administration placed China in a less-restricted export

39 Memo, Brzezinski to Carter, 7 Apr. 1978, Weekly Reports (to the President) 53–60 (4/78–5/78), Donated Zbigniew Brzezinski Collection, Box 41, JCL.

40 For a comprehensive overview of the Western export control regime, see Michael Mastanduno, *Economic Containment: CoCom and the Politics of East-West Trade*, Cornell Studies in Political Economy (Ithaca, NY: Cornell University Press, 1992).

41 "Foreign Policy Survey," Kreps 5/79 Trip to China: Memorandums in Support of Trip [1]: 4/79, NSA, Staff Material – Far East, Oksenberg – Subject File, Box 42, JCL.

42 Thomas Pickering to Lucy Benson, "PRC Meeting on Scientific and Technical Cooperation with the People's Republic of China, 12 Dec 1978," Sci 1.10 S&T Agreement1978 U.S./PRC, RG 59, Bureau of Oceans and International Environmental and Scientific Affairs, China Agreement on Scientific and Technical Cooperation, 1978–1980, Box 1, NACP.

43 Telegram State 266097, Secretary of State to U.S. Embassy Beijing, 11 Oct. 1979, CPFP, 1973–1979/ Electronic Telegrams, RG 59, USNA, (accessed May 3, 2024 at http://www.archives.gov).

44 U.S. Congress, House, Committee on Energy and Commerce, Global Climate Change: *U.S. Technology Transfer to China Hearing before the Special Subcommittee on U.S. Trade with China*, 98th Cong., 1st sess., 1983, 1.

category.[45] The STA remained largely unchanged as export controls evolved, a process of negotiation around S&T issues that allowed the broader U.S.-PRC relationship to develop.

Many reservations about the STA were voiced in congressional hearings after the agreement was signed. The Carter administration was secretive about the process leading up to the establishment of diplomatic relations with the PRC because it feared leaks and felt that the strength of the Taiwan lobby would cause difficulties. There was therefore no congressional involvement in 1978 around the drive toward an S&T relationship with the PRC.[46] Indeed, Congress was caught off guard by the Carter administration's announcement of normalization on December 15, 1978. It was also unfamiliar with the STA when it was announced. The first major interrogation of the new U.S.-PRC science cooperation took place in May and June 1979, in hearings before the House Subcommittee on Science, Research and Technology. Allen Ertel, a Pennsylvania Democrat who presided over the hearings, acknowledged that most people welcomed the S&T collaboration, but wondered, "To what extent will the assistance which we now provide to China cause us trade, employment, and defense problems in the long term in the same way that our generous and unselfish assistance to Japan, Germany, and others now gives us pause?"[47]

During the hearings, concerns were also voiced about long-term loss of jobs, military threats, intellectual property, limitations on researcher freedom and mobility, lack of oversight and strategy on the U.S. side of the collaboration and even the fear that the Chinese would grow indebted by buying high technology not suitable for their state of development. Some of these concerns, like the purchase of unnecessary expensive technology, largely disappeared from discussions in later years. Other concerns, like eventual economic competition and loss of jobs, were seen as unavoidable since China could not and should not be kept from modernizing. The rise of Japan as a manufacturing power in the 1970s caused most analysts to expect China similarly to rise up eventually to become a competitor.[48]

In 1979, Benjamin Huberman, associate director of the Office of Science and Technology Policy, estimated that the U.S. would be the "net beneficiary" of China's development for 10 to 20 years.[49] The most persistent concerns around the STA focused on intellectual property rights. In 1979, U.S. observers rather sanguinely expressed confidence that China would quickly develop a system for protecting IP. In fact, IP rights in relation to the STA were subject to negotiation for decades to come.

4. Conclusion: Extensions and Adjustments

Overview: *Recent controversies surrounding its renewal are an anomaly in the history of the STA, though significant additions have been made to address intellectual property rights. While the concerns voiced about the STA today are not new, neither are its benefits. Along with China's tremendous contributions to international science, U.S.-PRC S&T collaboration remains a powerful tool for strengthening a fragile relationship.*

For most of its history, the STA was renewed every five years through an essentially pro forma extension

45 Ibid, 3–21.

46 "Executive-Legislative Consultations on China Policy, 1978–79," Foreign Affairs Committee Print, 1980.

47 U.S. Congress, House, Committee on Science and Technology, United States-China Science Cooperation: Hearings before the Subcommittee on Science, Research, and Technology, 96th Cong., 1st sess., May–June 1979, 2.

48 Ibid.; Emblamatic of anxieties around Japanese competition: Ezra F. Vogel, *Japan as Number One: Lessons for America* (Cambridge, MA: Harvard University Press, 1979).

49 U.S. Congress, House, *Technology Transfer to China: Hearings before the Subcommittee on Science, Research, and Technology and the Subcommittee on Investigations and Oversight of the Committee on Science and Technology*, 96th Congress, 1st sess., Nov 13, 1979.

that did not alter the text of the original agreement.[50] However, substantial changes in the agreement took place within its sub-agreements, as well as in the biannual meetings of its joint oversight commission, which produces a report outlining priorities for the next two years. The first sub-agreement, signed in January 1979, focused on high-energy physics. As of today, there are around 30 agency-level protocols and 40 sub-agreements. The largest shift in the STA over its lifespan has been its sharpening focus on cutting-edge research. In 1979, the STA was a versatile tool wielded to support China's modernization, including in applied industrial and agricultural settings. This is no longer the case.

The only major changes to the STA itself have involved IP rights. In 1991, an IP annex was added, which was incorporated into many sub-agreements.[51] The fact that this issue continued to be the focus of negotiation for nearly two decades reflects its persistent significance. The STA was renewed every five years until 2016 and 2017, when it was subject to short-term extensions for the first time.[52] In 2018, the two parties agreed to amend the IP annex and renewed the agreement for another five years, until August 2023.[53] Since then, it has been subject to short-term extensions twice, and as of this writing, the STA has expired, although the two governments say that it is under active negotiation.

While the controversy and gridlock around the STA are new, many of the concerns voiced by the U.S. side are not. The STA is a high-level political document, and its broad scope means that it will naturally reflect the discontents of science collaboration in the relationship at large. Other policy instruments are likely better suited to targeting problem issues, while the STA can fulfill its intended function of facilitating exchange. It is ironic that, just at a time when the U.S. has far more to gain from science collaboration with China today than it did in 1979, it has allowed the STA to lapse. While geopolitics have shifted against U.S.-China science and technology cooperation, the overall benefits to bilateral political relations, American society and global humanity speak in favor of the continuation of the STA. Some of the indirect benefits recognized by the Carter administration in the early days have also reemerged as important factors today: now as then, science collaboration is a way to build goodwill in an uncertain and difficult relationship.

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Jimmy Carter Presidential Library, Atlanta (JCL)

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U.S. National Archives, College Park, Maryland (NACP)

NOTES

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50 E.g. "Cooperation in science and technology," *TIAS* 35 (1984): 4242-4244

51 Richard P. Suttmeier, "Trends in U.S.-China Science and Technology Cooperation: Collaborative Knowledge Production for the Twenty-First Century?" Research Report Prepared on Behalf of the U.S.-China Economic and Security Review Commission, 11 Sept. 2014, p. 31.

52 "China (16-421) – Protocol Extending the Agreement of January 31, 1979, as Amended and Extended, on Cooperation in Science and Technology," 21 Apr. 2016, *TIAS*, (accessed 3 May 2024) https://www.state.gov/16-421/; "China (17-830) – Protocols to Extend Agreement of January 31, 1979 on Cooperation in Science and Technology," 30 Aug. 2017, *TIAS*, (accessed 3 May 2024) https://www.state.gov/17-830/.

53 "China (18-922) – Protocol Amending and Extending the Agreement on Cooperation in Science and Technology," 22 Sept. 2018, *TIAS*, (accessed 3 May 2024) https://www.state.gov/18-922/.

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