The Role of Scientists in Normalizing U.S.–China Relations: 1965–1979

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INTRODUCTION

February 27, 1997 marked the twenty-fifth anniversary of the Shanghai Communiqué, the joint document signed at the conclusion of President Nixon's historical mission to the People's Republic of China (PRC) in 1972. The date was a milestone in U.S.–China relations, signaling the commitment of both countries to break more than twenty years of isolation. The communiqué was explicit about the first steps to be taken toward this end: people-to-people exchanges in science and technology, as well as those in culture, journalism, and sports, would open new channels of communication for the purpose of easing tensions. By 1979, when formal diplomatic relations were established, hundreds of scholars had traveled each way and new relationships had been formed, laying the foundation for wide-ranging and extensive engagement in the following years.

Politics, both domestic and international, was the driving force behind normalization during the 1970s, and it was the political agendas of both countries that determined the possibilities for bilateral science contacts as well. Nonetheless, once direct bilateral contact between scientists became possible politically in the early 1970s, communication and exchange among them were important factors in re-establishing the relationship between the peoples—and governments—of both countries.[1] This chapter will show that early interchanges in the relatively nonpolitical arena of science helped to build trust, identify common ground, and demonstrate that the two societies could work together after years of estrangement.

The contributions of these early contacts must also be viewed over the longer term and in the context of U.S.–China relations of the last century. In his investigation in this book of scientific cooperation and conflict management in U.S.–China relations after normalization, Richard Suttmeier looks at the role of science and technology cooperation in the maturing bilateral relationship. He shows that while the S&T relationship has been a positive force for integration and conflict resolution, it has led to conflict as well. To fully understand the conflicts of today, it is necessary to be aware of fundamental and enduring legacies of the past century's relationship.

Many actors in the People's Republic of China and the United States contributed to the development of science relations in the 1960s and 1970s: government (although its role had to be downplayed in the early years), nongovernmental organizations, and individual scientists who traveled independently or as part of organized groups. In assessing the contribution of scientists to normalizing relations, this paper will focus on the activities between 1966 and 1979 of the Committee on Scholarly Communication with the People's Republic of China (CSCPRC), administered by

the U.S. National Academy of Sciences and also sponsored by the American Council of Learned Societies and the Social Science Research Council. The emphasis on the CSCPRC is not intended to diminish the importance of activities of American scholars who visited China independently or as representatives of other organizations.

The CSCPRC is the focus for this study because it offers a perspective on the interplay among actors at all levels in the United States and China. First, because of its tripartite sponsorship, the CSCPRC represented a large and diverse community of American scientists and scholars in the social sciences and humanities. Second, it was independent of the government and yet operated with its support. Finally, the CSCPRC was responsible for arranging the vast majority of Chinese scholars' visits to the United States prior to normalization.[2]

This case study reviews three phases in the years prior to normalization, each representing distinct levels of engagement and opportunities. The first period, 1965-1970, describes efforts by a group of scientists and scholars in the United States to initiate direct communication with China through the formation of the CSCPRC at a time when U.S. official policy did not support rapprochement. It also addresses China's withdrawal from the world and the effect of politics and ideology on Chinese scientists during its domestic upheaval.

The second period, 1971–1976, represents the turning point in U.S.–China relations. With the worst of the Cultural Revolution behind it, China began to look outward again. Politics in the United States had changed as well. President Nixon made his visit, laying the groundwork with Chinese leaders for the unofficial exchange of scientists. Accomplished scientists from both countries served as delegates in a broader mission of rapprochement and succeeded in creating a basis for trust and open communication at a time when Chinese science was still heavily dominated by politics and ideology.

The final period, 1977–1979, represents the dawn of the post-Mao era. China lifted many of the ideological bounds on science and began to adopt more pragmatic policies, laying the foundation for normalization and the subsequent growth of bilateral relations. Science and technology were acknowledged for their importance in modernizing the economy, and contact with foreign countries for science training and research was encouraged.

Using the context of examples from the three historical sections, the final section examines how science and technology exchanges contributed to the development of relations prior to normalization in 1979, and what made the exchanges successful.

AMERICAN OVERTURES TO CHINA (1965–1970)

On the evening of November 6, 1964, a group of American scholars gathered at the Century Club in New York City for the first of several meetings to discuss ways to reestablish scholarly communication with mainland China after more than fifteen years of isolation. The meeting, attended by eminent scholars in the natural and social sciences and humanities, was hosted by the Hazen Foundation and chaired by John H.M. Lindbeck, then associate director of the East Asian Research Center at Harvard University. [3]

The meeting was prompted by a concern that American scholars and scientists remained cut off from direct communication with China at a time when China seemed to be opening to other Western countries.[4] China had increased interaction with several Western European countries, and had established diplomatic relations with France in early 1964. Would China be receptive to an approach from a nongovernmental and nonpolitical group in the United States? It seemed a distinct enough possibility that at the second meeting of the *ad hoc* group, on November 24, 1964, participants discussed establishing an office to explore and pursue opportunities to facilitate scientific and other scholarly communication with China. The agenda paper for the meeting gave the following rationale:

> The lack of an organized and systematic effort on the part of American scientists and scholars may have led to lost opportunities to determine the full range of possibilities for establishing fruitful intellectual encounters between Chinese and Americans. This situation should not continue. Obstacles to such encounters, direct and indirect, may be undergoing change at the present time for a variety of reasons—Sino-Soviet estrangement, expanding Chinese relationships with non-Communist countries, changes in China's international status and role, the possible emergence of more flexible U.S. policies with respect to China, the more sophisticated requirements of Chinese science and scholarship, increased incentives for both China and the U.S. to develop better systems of communications with each other, etc. New opportunities may therefore increase. Consequently, it may be deemed useful to establish an office … However, it must be recognized that the most promising opportunities for establishing contacts may well develop quite independently of any organized efforts.[5]

The first major task in establishing a program was to identify areas of common interest and then to identify a suitable institution or group of institutions that would sponsor efforts to explore the expansion of bilateral scholarly and scientific relations. It was agreed that efforts would have to be directed toward governments and academia in both China and the United States.

Participants at the November 24 meeting identified several organizations, including the Pugwash Conferences, various learned societies, and university affiliates, as possible sponsors for such a program. Among them was the National Academy of Sciences (NAS). Robert Sheeks, associate director of the NAS Pacific Science Board, noted that NAS Foreign Secretary Harrison Brown was likely to be receptive to this idea.[6] As a nongovernmental, private organization, the Academy operated independently from the government, although the government created the NAS to advise on scientific and technical matters. The NAS was already sponsoring the exchange of scientists with the Soviet Union.

At the end of its second meeting, the *ad hoc* group decided that the National Academy of Sciences should be asked "to assume immediate and active responsibility for developing arrangements, possibly under the sponsorship of the Conference Board of Associated Research Councils, systematically to explore and, as possible, to facilitate the extension of communications and the inauguration of exchanges between scientists and scholars in the United States and Communist China."[7] In late January 1965, John Lindbeck sent a letter to Brown on behalf of nine individuals outlining the objectives, principles, and procedures of the proposed committee.[8]

The committee was to promote scholarly communication between China and the United States by arranging for the purchase or exchange of publications, facilitating the meeting of U.S. and PRC scientists at conferences where both would be participating, arranging for exchange visits by individuals from one country to the other,

and selectively encouraging professional correspondence between Chinese and American scientists and scholars.

The committee was to adhere to several key principles. It would:

- take into account the legitimate mutual interests of both parties that are professional, scholarly, and intellectual in nature;
- be restricted (for the United States) to intellectual, scientific, and scholarly subjects and questions; in other words, be non-political;
- be (for the United States) entirely non-governmental in sponsorship, initiative, and management, at least as long as there are no diplomatic relations; and
- encourage all appropriate academic and scientific institutions, groups, and individuals of recognized scholarly and professional character in this country and abroad to approach and communicate with the Chinese with a view to bringing about useful exchanges of information, publications, and scholars.[9]

The proposal was put forth at the Academy Council Meeting on February 6, 1965. The Council agreed to establish the office, providing that "funds could be obtained from unimpeachable sources and that full contact and consultation with the Department of State were maintained." [10]

At the subsequent meeting of the Academy Council, on June 5, 1965, Brown proposed to establish the committee within NAS under the Pacific Science Board with Dr. Alan T. Waterman as chairman. He also noted the interest on the part of the American Council of Learned Societies (ACLS) and the Social Science Research Council (SSRC), and proposed to initiate a Joint Council of the three institutions, of which Dr. Waterman would also serve as chairman. The NAS Council agreed to authorize the acceptance of funds for an initial period of one year to support (1) a committee of the Office of the Foreign Secretary on science in Communist China, and (2) academic communication and exchanges with China, to be coordinated by a joint Council on Scholarly Relations with Communist China, sponsored by the NAS in cooperation with the ACLS and SSRC.

In a letter to Herman Pollack, acting director of International Scientific and Technological Affairs at the Department of State, Brown elucidated the motivations and hopes for the China Committee:

> We have undertaken this enterprise because not enough is known about the state of science on the Mainland and because our current ability to communicate with Chinese scientists is woefully inadequate. Communications with the Chinese scientific community are in fact worse than were our communications with the Soviets in the 1940s, while the communication of some, notably the British, Japanese, French, and Swedish, but including the Canadians, the Swiss, and others, gives growing evidence of accessibility to the Chinese, not to mention the Chinese need for contact with the outside world.
>
> We hopefully believe the U.S. scientific community can contribute to a lessening of the tensions between peoples and nations by endeavoring to create the basis for scientific discourse between Chinese and American scientists. We know that there are some risks attendant upon such a belief and upon any initiatives taken to test its validity. Thus we solicit the assistance and counsel of the Department of State in our discussions of this issue. [11]

The question remained as to whether an approach to senior scientists in China would improve the prospects for communication. Brown sought the opinion of Prof.

P.M.S. Blackett of the Royal Society, who had visited China in 1964. In Blackett's view, this was not likely because the top Chinese scientists were trained in the West and thus were not entirely trusted by their government. Blackett said he knew of no scientist with real access to political decision makers. He added that he knew of no evidence in Soviet relations with the West where conferences between Western and Soviet scientists had had any effect on Soviet policies, with the single exception of the test ban. While supporting the concept of scientific exchanges and the ideal of international scientific cooperation, he characterized the Royal Society's own exchanges with the Chinese Academy of Sciences (CAS) as being largely of cultural value with little political impact.[12]

In the spring of 1966, both the Edward W. Hazen Foundation and the Carnegie Corporation of New York came forth with funds to support the Committee on Scholarly Communication with Mainland China (CSCMC) over a period of two years, at levels of $50,000 and $125,000 respectively. Fourteen scholars were enlisted as members.

In October 1966, the CSCMC held its first meeting. The timing, however, proved unfortunate, coming just months after the onset of the "Great Proletarian Cultural Revolution," which was to have serious implications for society and science.

THE CULTURAL REVOLUTION AND ITS IMPACT ON SCIENCE AND FOREIGN RELATIONS

In 1966, tensions between Mao Zedong and proponents of more pragmatic policies, which had been growing for some time, erupted in the Cultural Revolution. The movement, led by Mao, was intended to attack his opponents in the Party bureaucracy and revive revolutionary commitment that had flagged after the disastrous policies of the Great Leap Forward. For three years, China was in total domestic upheaval.[13]

As the Cultural Revolution intensified in mid-1966, universities closed, anti-intellectualism grew, and scientists, scholars, and teachers were sent away from their institutes. Mao saw scientists as part of the intellectual elite that had worked in isolation from the broader population, often on projects that had no practical use. Basic research was virtually abandoned, with the exception of space science, for which Zhou Enlai was directly responsible. Research institutes were closed and their scientists were deployed to farms or factories to "learn from the masses" and to assist them in devising new or improved production methods in industry and agriculture.

Although initially it appeared that scientists might be spared the broader assault on intellectuals during the Cultural Revolution, this did not prove so. By 1967, the Chinese Academy of Sciences, China's preeminent research body, was in the midst of a struggle for power among rival political factions. Many scientists were denounced and attacked for continuing to hold "reactionary" views and for worshiping what was foreign.[14] A Revolutionary Committee was established at the CAS, and People's Liberation Army teams assumed leadership of other research organizations.[15]

The domestic tumult spilled over to foreign affairs, further isolating China from the rest of the world. Personnel in China's Foreign Ministry at home and abroad were

charged with "bringing about capitalist restoration." China withdrew its ambassadors abroad. At home, the Ministry of Foreign Affairs was briefly occupied by Red Guards and many embassies were attacked, including those of Burma, India, Great Britain, the Soviet Union, and Mongolia. Many foreign diplomatic personnel were physically attacked or harassed, including the French Ambassador and the British Charge d'Affaires.[16] By 1971, only France, North Korea, North Vietnam, and Sweden had diplomatic personnel in Beijing who could be considered scientific attachés[17]

Although a few individual Europeans were able to visit China during the late 1960s, the type of scholarly visits that had been possible previously were out of the question. Chinese scientists attended no international conferences and ceased publication of hundreds of scientific journals. The 17th Pugwash Conference on Science and World Affairs acknowledged China's conspicuous absence, noting that "no project for collective security, scientific cooperation, or development can be truly effective without at least China's willingness to consent."[18]

The CSCMC remained intact through these years, but its activities were confined largely to monitoring developments in China, gathering information about the state of Chinese research, and facilitating the exchange of scientific reprints. Most scholars agreed that there could be no communication with the Chinese until Peking made a political decision in favor of it.[19] Prospects for communication with the United States appeared especially bleak. As Assistant Secretary of State Marshall Green noted a few years later:

> Peking finds high utility in the so-called "devil's role" in which it has attempted to cast the United States. Our assuming the "devil's role" has utility to Peking for purposes of maintaining domestic cohesion in the face of an alleged foreign threat, as well as in the very vital global context of communism's "anti-imperialist" struggle … Improvement [of relations] may have to await the time when Peking sees greater value in fundamental reconciliation with the United States than it now derives from our highly valued devil's role.[20]

Through 1969, the CSCMC could only continue to wait for political conditions in China to change. However, 1970 brought signs of hope. In January 1970, the United States and China agreed to resume the periodic meetings in Warsaw that had been held for many years to help compensate for the lack of formal diplomatic relations but had been broken off by China in January 1968.[21] In August 1970, Edgar Snow became the first American journalist to be granted a visa to visit China since the start of the Cultural Revolution. By the end of 1970, China had established diplomatic relations with several countries and there were indications that the Chinese leadership was taking more interest in the development of science and technology. In April 1970, China launched its first space satellite, evidence of the gains in space research made during the Cultural Revolution.

MOTIVATIONS AND EXPECTATIONS

Politically, China and the United States shared some common ground by the early 1970s: both wanted to strengthen their positions *vis-à-vis* the Soviet Union, and both sought a negotiated peace in Vietnam. Tensions between the Soviet Union and Chi-

na, which had escalated since 1960, had by 1969 become alarming. Along the Mongolian border, both sides pursued intensive military buildups that included nuclear weapons. There were numerous border incursions by both sides, and serious fighting broke out in Xinjiang and along the Ussuri River in 1969. Statements of warlike intentions on both sides caused Western observers to fear the possible escalation to a preemptive Soviet nuclear strike.

In the United States, public support for establishing relations with the PRC had increased, in part because of growing disillusionment with the Vietnam War, but also because of the Sino-Soviet tensions and because of the acceptance of analyses being done by U.S. China specialists. However, there were considerable reservations about withdrawing recognition of Taiwan and supporting China's membership in the United Nations, two of the PRC's most important foreign policy objectives.

In the midst of these broader political concerns, scientists and scholars had additional motivations for seeking exchange with China. These ran the gamut from a basic curiosity about China to a conviction that China should not be isolated from the international scientific and scholarly community. Very little was known about developments in Chinese science since the early 1960s, but the first Western visitors confirmed that China was well behind the United States in most areas of science and technology.

Nonetheless, scientists from many disciplines took professional interest in China. Some were interested in developments in Chinese agriculture and medicine. As an important center of genetic diversity, China could make germplasm contributions to world agriculture and it had made great advances in the development of integrated pest control. In the medical sciences, there was keen interest in acupuncture and herbal pharmacology. The Chinese had conducted extensive research on the problems of malignant disease, on techniques of limb re-implantation, on the correlation of environment and disease, and on the impact of lifestyle on health. They were also doing work on protein structure, having synthesized active insulin in 1965.

The unique aspects of China's society and natural environment also drew scientific curiosity. For example, Peter Raven became interested in Chinese efforts to create a flora of China and in 1975 began negotiations with the Chinese Academy of Sciences for a bilateral exchange of botanists. The project was of considerable significance to Raven, then president of the Botanical Society of America, because China is the world's only country with an unbroken continuum of climate zones and it is possible to find associations of plants rarely seen elsewhere in the world. These associations could help scientists understand the nature of ancient floras from which the flora of the Northern Hemisphere was derived.

In seismology, China's development of earthquake detection systems drew attention worldwide. In 1975, Chinese scientists predicted an earthquake measuring 7.4 on the Richter scale that struck near a region of populous cities. The massive evacuation before the earthquake saved countless lives. The Chinese had also collected a sizable body of paleomagnetic data, useful to geologists researching plate tectonics.[22] Archaeological explorations and developments in meteorology were other areas of interest to Western scientists.

For its part, China was most interested in viewing advanced science and technology work in the United States that related to its own industrial and agricultural priorities: computer science, petrochemical engineering, mineral extraction, telecommunications, agricultural mechanization, and industrial automation.

It is important to note that the desire for research and exchange opportunities in China was far greater among U.S. social scientists and humanists than among researchers in the natural sciences and engineering, but because China considered inquiry outside the "hard sciences" to be more politically sensitive, it denied many requests for such access. As the 1970s wore on, exchanges in the sciences became increasingly important in leveraging access for social scientists and humanists, a point that will be revisited later.

THE FIRST COMMUNICATIONS AND EXCHANGE (1971–1977)

If we succeed in working together where we can find common ground, if we can find common ground on which we can both stand, where we can build the bridge between us and build a new world, generations in the years ahead will look back and thank us for this meeting that we have held in this past week. Let the Chinese people and the great American people be worthy of the hopes and ideals of the world, for peace and justice and progress for all.

RICHARD NIXON'S TOAST TO CHAIRMAN MAO AND ZHOU ENLAI, FEBRUARY 27, 1972

In the spring of 1971, it became clear that China was attaching new importance to foreign relations as it sought to break out of its international isolation and strengthen its position vis-à-vis the Soviet Union. There were also signs that CAS was being rehabilitated.

In March 1971, a group of Chinese scientists attended their first international scientific conference in five years—an oceanography conference in Bordeaux, France.[23] In April, China invited members of the American Table Tennis Association to China.[24]

In May 1971, the first two American scientists visited China since 1949: Arthur Galston, a plant physiologist from Yale, and Ethan Signer, a microbiologist from MIT. Galston and Signer, hearing of the ping pong team's visit while they were in North Vietnam, requested a stopover in China on their way home, and were granted an invitation by the Science and Technology Administration of the People's Republic of China (STAPRC).[25] Galston had a classmate from Caltech, Luo Shiwei, who was a researcher at the CAS Shanghai Institute of Plant Physiology. Galston and Signer were received in Beijing by Premier Zhou Enlai. Plans were also made for the Americans to go to Shanghai so that Galston could see Luo. At the same time, Prince Norodom Sihanouk was also in Shanghai, and Zhou suggested and arranged a meeting, which took place on May 21.[26] The visit laid the foundation for a subsequent delegation to China the following year under the auspices of the Federation of American Scientists (FAS), of which both Galston and Signer were members.[27]

Meanwhile, the CSCMC was regrouping. On January 4, 1971, the Executive Committee met and decided to change the Committee's name to the Committee on Scholarly Communication with the People's Republic of China (CSCPRC). It also decided that the CSCMC should write a letter to President Nixon with a copy to the Secretary of State endorsing steps taken by the White House in dealing with the People's Republic of China,[28] and that Harrison Brown should ask the Swedish Academy of Sciences to convey a message to CAS President Guo Moro stating the Academy's desire to initiate relations.[29] Erik Rudberg, Permanent Secretary of the

Royal Swedish Academy of Sciences, duly conveyed the message and offered to mediate further efforts in this regard. In May, Anne Keatley, Executive Secretary of the CSCPRC, hand-delivered a letter to Guo Moro, signed by the presidents of NAS, ACLS, and SSRC. Keatley accompanied her husband, Robert Keatley, a reporter for *The Wall Street Journal*, to China with several other journalists who had been invited by the Chinese government. The letter invited Chinese scholars to attend five international scientific meetings in the United States in the coming year, and suggested discussions on scholarly exchange. The letters were also brought to the attention of Premier Zhou Enlai, whom Keatley met at a dinner organized for the journalists. During the meal, Keatley writes, Zhou confided that he was guilty of "bureaucratism" because he had not heard of the Committee until that day.

> Chou [Zhou] was apparently interested in the China Committee and the Academy. We were quite fortunate to have had our letters and invitations seen by the man whom most China scholars consider to be a guiding force in China today, second only to Mao. I would say that the statement regarding lack of preparation would indicate that we will not receive a positive response, but perhaps an acknowledgment from the Chinese Academy …[30]

By late summer 1971, NAS had received no response to either of its overtures. On August 24, Harrison Brown and Anne Keatley met with Lao Xin, First Secretary of the Embassy of the PRC in Ottawa, Canada, to reiterate the CSCPRC's desire for informal exchanges between the Chinese and American scholarly communities and to stress the nongovernmental aspects of the CSCPRC.[31] Another letter was provided to Lao Xin for transmittal to Guo Moro.

A day before the Ottawa meeting, *The New York Times* published an article on the visit to China of U.S. physicist and Nobel Laureate Yang Chen-ning of SUNY Stony Brook. Dr. Yang had discussions with scientists in Peking and Shanghai, and met with both Premier Zhou Enlai and Mao Zedong. According to the *Times*, "the meeting between Mr. Chou [Zhou] and Dr. Yang was viewed [in Hong Kong] as a move by Peking to give a new respectability to the scientific community … ."[32] Upon reading the report, Brown telephoned Yang for his assessment of the possibilities for exchange. Yang said he had been told that private exchanges could be arranged, but there could be no government program. NAS was still seen to be a governmental agency.[33]

THE SHANGHAI COMMUNIQUÉ: A BASIS FOR BROADER SCIENCE AND CULTURAL EXCHANGE

President Nixon's trip to China in February 1972 and the Shanghai Communiqué marked a turning point in Cold War-era U.S.–China relations, and for the CSCPRC. The Communiqué endorsed both governments' commitments to the objective of normalizing relations and provided a framework for realizing this goal. First among the three steps agreed upon was the facilitation of people-to-people contacts and exchanges in the fields of science, technology, culture, sports, and journalism.

So began the period of unofficial exchanges, where, in the absence of formal diplomatic relations, scientists also served as "diplomats" and shapers of professional elite opinion about China. At the time of Nixon's trip, about ten U.S. scientists, engineers, and physicians had visited China. By the end of 1972, some 100 scholars

had traveled to China on a people-to-people basis, bringing home their observations on science and society.[34] Many reported that scientific research had been resumed on a broad front in China, and the ideological emphasis had been toned down.

In May 1972, Anne Keatley wrote a memo to NAS President Philip Handler, Foreign Secretary Harrison Brown, and CSCPRC Chairman Emil Smith, urging a renewed approach:

> There are a number of indications that now is the time for us to make new initiatives toward the Chinese. I believe this should be in the form of an invitation to the Chinese Academy of Sciences, to send a delegation of Chinese scientists to visit the United States … It is difficult to assess whether the invitation should come from the National Academy of Sciences or the Committee on Scholarly Communication with the People's Republic of China. However, I believe that, as a matter of form, it should be from one Academy to another. [35]

At last, the NAS received a response. In the fall of 1972, the first scientists from China arrived in the United States on two survey delegations, intended to identify areas for possible further exchange. The first delegation, a group of eleven physicians hosted by the National Academy of Sciences and Institute of Medicine, arrived in October. The second, a delegation representing seven scientific fields, arrived in the United States on November 20 and was hosted jointly by the CSCPRC and the Federation of American Scientists. The latter delegation was headed by Dr. Bei Shichang, director of the CAS Institute of Biophysics. A German-trained experimental biologist, Dr. Bei was a member of the Standing Committee of the National People's Congress and a member of the Presidium of the STAPRC. Three of the six other delegation members had undertaken research or studied in North America.[36] The delegation visited governmental and private agencies dealing with science policy, including the NAS, Office of Science and Technology Policy, National Science Foundation (NSF), and the Council on Environmental Quality. The three members who had studied in the United States saw many of their former professors, old friends, and colleagues.

Anne Keatley notes that during the delegation's final days in San Francisco, members of the delegation opened up considerably. They asked questions of the Americans who had been traveling with them and evinced great interest in the CSCPRC and its capacity to handle large numbers of scholars traveling in the United States. At a private dinner one evening, Prof. Bei asked Keatley whether theNAS wanted to cooperate with CAS. Keatley responded that it had been NAS's wish for several years. Prof. Bei said that Academy-to-Academy relations were still uncertain, but that communication between the CSCPRC and STAPRC was completely open.[37] At the farewell banquet for the delegation in San Francisco, Prof. Bei toasted to old friendships between Chinese and American scientists, and noted that the seeds of new friendship "are sure to grow fast and bear rich fruit."[38] Upon their return to China, the delegation was met personally at the airport in Beijing by Guo Moro, a gesture that symbolized the unusual importance that CAS attached to the visit.[39]

By the end of 1972, numerous American scholars returned from China to report that more time was being spent on visits to research institutes, universities, and laboratories, and less time on touring. American scholars found themselves giving lectures, holding seminars, observing the working of equipment, exchanging current information with students and professors, and generally participating actively in scholarly exchanges.[40]

Chinese delegations were attending more international meetings, many sponsored by the United Nations, to which China was admitted in October 1971. However, the Chinese routinely declined invitations to international conferences in which any of the conveners recognized Taiwan.

The special role of American scientists of Chinese origin in building early relationships was already evident at this stage. The first scientific cooperation between individual Chinese and American scientists was undertaken in the fall of 1972. Prof. Niu Menchang of Temple University spent four months at the CAS Institute of Zoology in Beijing working with Prof. Zhou Dongli on the role of RNA in cell differentiation, development, and hereditary characteristics. The results of their work were reported in *Scientia Sinica*.[41]

A second cooperative venture took place in late 1973 between Ye Duzheng of the CAS Institute of Atmospheric Physics and Prof. Chang Chieh-chien (C.C. Chang) of Catholic University. The result of their cooperation was a paper entitled "A preliminary experimental simulation of the heating effect of the Tibetan Plateau on the general circulation over Eastern Asia in the summer," which appeared in *Scientia Sinica* a few months later.[42]

INSTITUTIONALIZING NATIONAL PROGRAMS FOR U.S.–CHINA EXCHANGE

After continued bilateral talks in Paris, Henry Kissinger visited China in February 1973—as U.S. involvement in the Vietnam War was coming to an end—to discuss details of arrangements that Nixon had made during his trip the previous year.[43] The CSCPRC and National Committee on U.S.–China Relations (NCUSCR) had jointly prepared a "Position Paper on Sino-American Scholarly, Educational, and Cultural Exchanges"[44] the previous August and had sent copies to both Kissinger and Assistant Secretary of State John Holdridge, which they discussed in person that fall.

During Kissinger's visit, agreement was reached on several exchanges of delegations that would take place through August 1973. The U.S. government decided to delegate responsibility for formalizing these and future arrangements to the CSCPRC. At the same time, the NCUSCR was selected to administer professional, political, educational, and cultural exchanges on behalf of the government. Both the CSCPRC and NCUSCR were to run "facilitated" exchange programs, meaning that the exchanges were discussed each year by the governments of both countries. In the absence of formal relations, they were the closest thing to "official" exchanges. With this agreement, the program administered by the CSCC became the focus of Sino-American scientific exchange until normalization.

Each year, U.S. Department of State representatives met with representatives of the Chinese Foreign Ministry in Peking to discuss an overall exchange "package" which included the exchange proposals of the two organizations and other groups such as Congressional delegations. While government representatives presented the exchange program, they did not discuss details of the programs. Negotiations on details were left to the individual exchange organizations.

The CSCPRC's counterpart organization was the Science and Technology Association of the People's Republic of China which was founded in 1958, and consisted of professional societies. It was responsible for conducting China's international exchanges in science and technology. The Foreign Affairs Bureau of STAPRC, which oversaw daily operation of the program, also served as the Foreign Affairs Bureau of CAS and its affiliated research institutes. Communication between the CSCPRC and STAPRC was assisted greatly by the Liaison Office of the People's Republic of China, in Washington, DC, which had been set up in May 1973.[45]

That spring, a nine-member delegation representing the CSCPRC visited China to discuss exchanges for 1973 and 1974. There, the group reached agreement with STAPRC for sixteen additional delegation visits. Although the agreement was limited to short visits, it demonstrated China's willingness to expose more of its S&T personnel to Western science. Moreover, the Chinese signed an agreement with the CSCPRC despite the fact that the NAS maintained relations with Taiwan.[46]

The agreement did not require reciprocity in the fields of exchange—something that the Soviets and Eastern Europeans had insisted upon in their inter-Academy agreements with the United States. This arrangement allowed China and the United States to send groups that would be of most benefit to research and scholarship in the respective countries.

Progress was being made in other areas as well. In the first half of 1973, several U.S. chemists had been invited to lecture in China, and the National Science Foundation awarded its first travel grants for scientific visits to China. Also that year, five Chinese engineers were the first to attend a scientific meeting in the United States.[47]

SCIENTISTS COME UNDER NEW ATTACK

Throughout 1973 and 1974, delegations were exchanged more or less according to the agreement set by the CSCPRC and STAPRC in 1973, despite renewed internal conflict in China that returned to temporary ascendancy the ultra-leftist wing represented by the "Gang of Four" headed by Mao's wife Jiang Qing.

This period of renewed internal conflict was to have severe implications for science, as illustrated by the following example. During a visit by Yang Chen-ning to China in 1972, he urged his colleagues at the CAS Institute of Physics and the science faculty at Peking University to pay more attention to basic theory. Official Chinese sources reported that Yang's remarks were praised by Mao and met with the full approval of Premier Zhou Enlai.[48] With Premier Zhou's blessing, Chinese scientists were urged to discuss the situation and decide what, if any, action should be taken. Premier Zhou asked Zhou Peiyuan, vice chair of the Revolutionary Committee of Peking University, to help steer this work. Zhou Peiyuan had studied and worked in the United States for many years before 1949.

In October 1972, Zhou Peiyuan published an article stating his view that while applied research was important, basic research could not be neglected since it was essential for the development of science. The article was reviewed at the highest levels for several months before its publication in *Guangming Daily*, known as the paper read by intellectuals. Yao Wenyuan, member of the "Gang of Four" in charge of propaganda, had made sure that the piece was not published in the *People's Daily*,

the party organ for which it had originally been commissioned. After its publication, Zhou Peiyuan became a target in a rising tide of criticism against scientists and intellectuals who were viewed as wanting to "restore the old." Even Premier Zhou was criticized for his "rightist" role.[49] Two Western scientists visiting China in 1977 were told that, in fact, the Gang of Four's influence on science was stronger during 1973–74 than it had been in the late 1960s.

EVALUATION OF PEOPLE-TO-PEOPLE EXCHANGES

By 1975, the U.S. government decided that it was time to assess the gains that had resulted from people-to-people exchange. In a closed session on February 25, 1975, the U.S. Advisory Commission on International Educational and Cultural Affairs heard testimony from the State Department's Bureau of Educational and Cultural Affairs and Bureau of East Asian and Pacific Affairs, the National Committee on U.S.–China Relations, the CSCPRC, and the president of Yale University. The Commission concluded that the exchanges

> were giving concrete and visible evidence of progress toward normalization of relations between the United States and the PRC; and, more importantly, were establishing contacts between individuals and institutions which might lead to greater mutual understanding … at the present time, the exchange program is one of the best tools available to us for building mutual understanding between the United States and the PRC which is essential for an enduring peace.[50]

Indeed, a number of specific gains had accrued: Committee delegation visits to China provided expert assessment of China's science in key disciplines, such as medicine, seismology, and plant studies. Relationships of some continuity and depth had developed in important areas of research and scholarship. Science relations were providing leverage for access by scholars of Chinese culture, society, and politics. Finally, the CSCPRC had established good working relations with STAPRC. The relationships formed in those programs would be the foundation for strong bilateral ties between Chinese and American academic, research, and technical communities in the coming years.

Nonetheless, the authors of the report, like most observers, maintained that from the U.S. perspective exchanges had been more significant in building goodwill than in furthering scientific research and scholarship on China. The report made four recommendations: (1) improve the balance between exchanges in the scientific/technological and social science/humanities disciplines; (2) increase the duration of some scholarly visits; (3) review the process for selecting delegation participants to ensure the widest possible range of representation in the U.S. delegation; and (4) encourage Chinese studies in American universities.[51]

Some of these concerns were incorporated into the CSCPRC's exchange proposal for 1976 and communicated through the Liaison Office in Washington, DC. STAPRC responded that it must continue to move gradually in expanding science relations and that people-to-people relations can achieve only rough parity. However, a concession was made to invite a group from the United States to study Chinese painting.[52]

Individual scientists made their own assessments of the impact of exchanges. Yang Chen-ning noted that,

> The better up-to-date knowledge of developments abroad has a stimulating effect on Chinese research directions. Comparing the vigor with which scientific research is pursued in China in 1976 and in 1973 or 74, it is clear that, at least in the fields of physics and mathematics, this stimulation has produced profound changes of outlook. Chinese scientists appreciate that scholarly communication with the U.S. has played an important role in this development. This observation applies to other fields of research activity as well."[53]

By early 1976, a split had widened in China between the Gang of Four radicals, who supported Chairman Mao, and the moderates, who favored the less doctrinaire approach of Premier Zhou Enlai. Zhou had groomed First Vice Premier Deng Xiaoping as his successor. After Zhou's death in the spring of 1976, however, Mao stripped Deng of his positions and appointed Hua Guofeng, who represented neither the extreme right nor the extreme left, as Premier. In September, Mao died. Within a month, the Gang of Four was arrested. Hua Guofeng became the new party chairman and moved moderates into key positions in the Academy. Almost immediately, numerous articles appeared, many written by scientists, criticizing the misguided policies of the Gang of Four.[54]

With Hua's ascendance, China projected a more moderate line toward the United States and imposed fewer ideological constraints on its own scientists. Although U.S. attempts to bring its government agencies directly into the exchange process had been unsuccessful during this period, scientists made considerable headway in laying a solid foundation for bilateral communication that would soon move to a new level.

POLITICAL RELAXATION IN CHINA (1977–79)

The purge of the Gang of Four and the reemergence of Deng Xiaoping in late 1977 as Vice Premier ushered in an era of pragmatism and openness to foreign contacts which included as a key component the modernization of China's science and technology. By the early spring of 1977, China agreed to increase the number of its scientific exchange visits with the United States.[55] In early 1978, a CSCPRC report observed that "Until about six months ago, most letters from American scientists to their Chinese counterparts either went unanswered, or were answered in the most formal manner." The report noted that Chinese researchers had recently begun substantive correspondence with some American scientists, including an exchange of papers, data, and charts.[56]

CSCPRC delegations to China in 1977 noted that scientists were much more candid in discussing the state of their respective fields and their hopes for the future.[57] A report by the CSCPRC staff director noted that "Clinical conferences on breast cancer and leukemia and two joint seminars on randomized clinical trials were convened. Their program, arranged by the Chinese Medical Association, stands in sharp contrast to the tense and constrained visit by the Schistosomiasis Delegation in 1975."[58]

While the report noted that the visits seemed more relaxed, there had been no significant change in the exchange format, such as more focused visits to fewer institutions for longer periods. Longer-term individual visits would have to await formal diplomatic relations. The CSCPRC's exchange program would consist of six delegations each way in 1978.[59]

NATIONAL SCIENCE CONGRESS

In March 1978, China held its first National Science Conference since 1950. This was a critical meeting; for scientists, it marked the beginning of a new era. The meeting acknowledged that the contributions of scientists would be essential if China was to reach its economic goals for the next decade and beyond. Deng Xiaoping's attendance and his opening address to the Conference were significant, for Deng was a pragmatist who acknowledged the importance of intellectuals in developing society. In his address, Deng warned that political cadres should not interfere in the work of scientists: "We cannot demand that scientists and technicians … study a lot of political and theoretical books … and attend many meetings not related to their work."

Following the National Science Conference, China greatly increased the number of scientists and engineers sent to the United States—on both commercial and noncommercial missions. Scientists accepted invitations from professional societies, universities, and ad hoc groups abroad. STAPRC increased the number of American science delegations it would host in addition to those under CSCPRC auspices. These developments marked a new pluralism in exchanges, as many Chinese institutions organized their own exchange programs with little central coordination.

THE FRANK PRESS VISIT

In July 1978, President Carter's Science Advisor Frank Press led a delegation to China that included the heads of numerous government offices.[60] It was the highest-level American scientific delegation ever to go to the People's Republic, and the largest assembly of high-ranking research officials ever sent abroad. Initiated by President Carter, the trip was first discussed with the Chinese during Zbigniew Brzezinski's trip to Beijing in May. The visit was to be an inspection tour to determine what was of interest to China for cooperation with the United States. In discussions with Vice Premier Fang Yi, Press and his delegation laid the basis for the subsequent protocols for cooperation in the sciences, including the Understanding on Agricultural Exchange, the Understanding on Cooperation in Space Technology, and the Agreement on the Exchange of Students and Scholars, all of which were signed before the end of 1978.

The biggest surprise of the visit was the news that China wanted to send hundreds of students and scholars to the United States, rather than twenty or thirty, as the Americans had expected. Moreover, the Chinese said that they would pay their own costs, in contrast to other U.S. exchange programs in which the receiving side paid visitors in-country costs. NSF Director Richard Atkinson was directly engaged in the discussions on the exchange of students and scholars, and theNSF assumed the role as the lead government agency for subsequent talks. NSF asked the CSCPRC to administer the student exchange program on behalf of the U.S. government and to prepare a formal proposal for an extended exchange program that would be submitted to STAPRC in September for consideration before bilateral talks in Washington in October.[61] The resulting document outlined a proposal for language training, language and cultural studies, and science research exchange.[62] The proposal was dis-

cussed in October by a Chinese education delegation, headed by Zhou Peiyuan, and an American team, headed by Richard Atkinson of NSF. On October 23, 1978, agreement was reached on a general framework for exchange that would include students, scientists, and visiting scholars. China would send 500–700 persons to the United States in 1978–1979, and the United States would support sixty students and scholars to go to China during the same period, with the understanding that other American students would go to China under separate arrangements.

The Press visit was a milestone in raising the profile of bilateral science relations and establishing a basis for future exchanges. China's enthusiastic response to the proposed exchange program augured well, as did its willingness to put aside the issue of Taiwan.[63]

NORMALIZATION OF RELATIONS

On January 1, 1979, the United States and China established full diplomatic relations. On January 31, Vice Premiers Deng Xiaoping and Fang Yi visited the United States and signed agreements in science and technology, student and scholarly exchanges, space technology, high-energy physics, agriculture, and cultural relations. It was agreed that a U.S.–PRC Joint Commission on Scientific and Technological Cooperation would be established and would meet in the United States and China alternately each year.

As Richard Suttmeier discusses in his chapter, these agreements launched a new era of official bilateral relations and catalyzed more nongovernmental efforts between the technology and education communities of the two countries. Many of the protocols stemmed from discussions and observations that took place during the thirty-seven visits of Chinese scientific delegations to the United States and thirty American scholarly delegations to China that the CSCPRC sponsored between 1972 and the end of 1978.

CONCLUSION

Chairman Mao was noted as saying that "science cannot be separated from politics." Indeed, politics strongly influenced opportunities for scientific communication during the period of this paper. When it suited their motives, politicians used science exchanges as a tool for establishing contact, building trust, changing mutual perceptions, bringing back new understandings of the other country, and helping to build a more positive image of the country domestically. Allowed to communicate with colleagues, scientists quickly developed personal ties based on their own professional interests and curiosity.

In looking at the contributions that science exchanges had on the growth of the relationship between the United States and China during the 1970s, two questions can be asked. First, what factors influenced the success of the bilateral science relationship? Second, how did science ties contribute to the broader relationship and, eventually, diplomatic recognition?

FACTORS INFLUENCING SUCCESS

Human "Bridges"

A key factor in the growth of the relationship were the people who served as bridges between the two societies. These included Chinese scientists who had been trained in the United States before 1949, American scientists of Chinese descent, and, to a lesser extent, Americans who had lived in China before 1949. The language facility, cross-cultural insight, and professional reputations of these people facilitated early communications and engendered trust in the scientific communities of both countries. American scientists of Chinese descent were among the earliest and most frequent visitors to China. Yang Chen-ning and others would often meet the Chinese leadership. Niu Menchang and Chang Chieh-chien were the first Americans to undertake cooperative research with Chinese counterparts. Zhou Peiyuan, Bei Shichang, and a host of other foreign-trained scientists represented the backbone of China's scientific community and were among the most active supporters of the emerging bilateral relationship. Given the number of talented Chinese students and scholars now in the United States, there is reason to expect that the current generation will, similarly, have an enormous impact on future bilateral relations—especially given the importance of science in defense modernization, and the continuing tension and distrust over such issues as Taiwan and weapons proliferation policies.

Relationships formed during this period have led to numerous subsequent research opportunities through private channels and some of the most significant cooperative work being done. As noted earlier, the early visits to China by Peter Raven (himself born in Shanghai) resulted in collaboration on the Flora of China project, one of the most important and successful collaborations to date.

Establishment of Nonofficial Channels of Communication

Another factor contributing to the success of the relationship was the existence of appropriate channels for nonofficial communication. In this case, as in others where countries are in conflict or are suspicious of political motivations, the appearance of government influence or control had to be avoided. Individual American scientists made the first visits to China. Initial NAS overtures to China went unanswered for some time, as China perceived the organization to be a branch of the U.S. government, contrary to the fact and despite NAS denial. With the visit of the first Chinese science survey delegation, members had the opportunity to better understand the scientific infrastructure in the United States, not only for scientific research, but for science administration as well. Evidently, the CSCPRC was viewed as sufficiently neutral to serve as an acceptable conduit for subsequent visits of Chinese scholars. Once they learned more about the NAS, the Chinese quickly came to view the CSCPRC's ties to the NAS as an asset rather than a disadvantage. Also, the fact that CSCPRC-sponsored activities, while not official, were officially sanctioned reassured the visiting delegations. Official concern in both China and the United States for the safety of the earliest groups was demonstrated by the number of security escorts assigned to the delegations by the State Department. The level of security apparently made a profound impact on both Chinese and American participants, as it is consistently mentioned in their recollections.

The Nonreciprocal Nature of the Exchanges

The non-reciprocal nature of the exchanges also contributed to their success. Unlike the U.S. arrangement with the Soviet Union, exchanges with China demanded reciprocity neither in the number nor the fields of exchange. This allowed each side to focus on areas of its own greatest interest. This flexibility was particularly critical in enabling the United States to leverage access to China for American scholars of Chinese culture, society, history, and politics. Although obtaining Chinese approval for American visits in the social sciences and humanities remained difficult throughout the 1970s, the situation would have been far bleaker without the leverage of science exchanges. In 1978, discussions on the agreement for the exchange of students and scholars incorporated another new feature: the sending side would pay in-country costs. This obviated the awkward and petty difficulties that had arisen in the U.S.–Soviet exchange relationship in calculating par numbers of person-months.

Value of Science

Finally, the value of science itself helped the relationship to succeed. Science and technology was critical to China's developmental aspirations. Chinese scientists who participated in the earliest exchanges consistently note the profound impact that these exchanges had on their disciplines and on society. The willingness of a technologically advanced country such as the United States to share its knowledge and offer opportunities for cooperative research was a powerful gesture. At the same time, the United States and many other countries were glad to encourage the large number of extremely talented scientists to once again work with the international scientific community on issues of common global concern to which China could make unique and necessary contributions.

THE CONTRIBUTIONS OF SCIENCE EXCHANGES TO THE BILATERAL RELATIONSHIP

Most observers view the contribution of science exchanges to the growth of bilateral relations as primarily symbolic. Frank Press notes that "The symbolism of nations working together in an area as strategic as science is important." John Richardson, Assistant Secretary of State for Educational and Cultural Affairs during the Ford administration, adds that for both countries, exchanges "serve to remind our peoples and others in the world that the period of Sino-American estrangement and animosity has ended and that a new relationship based on mutual perception of common interests has taken shape."[64]

Indeed, many of the gains during this period are difficult to measure, and were as much symbolic as concrete. Communications about science provided a forum for mutual respect and common inquiry. From the perspective of one Chinese official, the exchange of delegations not only proved that China *could* work with the United States, but also, in a sense, showed that the two countries were *destined* to have closer relations. "In the end," says Li Mingde, "the interaction proved to be a natural trend that no one could stop."[65] Periodic negotiations over the approval of delega-

tions, access by social scientists, issues of reciprocity, and exchange formats, while often frustrating, provided ample opportunity for give and take.

Still, the value of science exchanges was not only symbolic. Science exchanges offered an opportunity for participants to gain knowledge first hand, which was important for policy making. This included, most obviously, information on the state of particular research, the structure of science administration, and potential areas for long-term cooperation. Reports resulting from these exchanges served as blueprints for bilateral cooperative research agendas after normalization, especially in the medical and earth sciences. This was facilitated by the participation of scientists from U.S. government agencies in the earliest delegations.

Delegation visits also provided a window on the workings of the other's society. "Meetings conveyed, in ways that reading scientific literature cannot, a feeling both for the new ideas and directions in their fields as well as for a sense of the social and human context within which all scientific work takes place." [66]

The effect of exchanges on American and Chinese public attitudes and perceptions was also important. It extended beyond the direct encounters between scientists, scholars, and technicians. Exposure of "average citizens"—bus drivers, restaurant owners, and families who hosted delegation members in their homes—to the foreign visitors helped to dispel negative preconceptions and helped establish a more congenial atmosphere for reestablishing diplomatic relations.

After the establishment of diplomatic relations, governmental, nongovernmental, and individual contacts with China multiplied. As the range and depth of contacts increased, and as China pursued its goal of economic modernization more energetically, the role of science and technology in bilateral relations became more complex, as Richard Suttmeier documents in his paper. In the changed environment, he writes, S&T ties have been sources of conflict as well as cooperation. Yet even since normalization, he notes, S&T ties have remained of secondary importance to other aspects of politics.

In the limited scope of history from 1965 to the establishment of diplomatic relations, science was a prominent and constructive force in the emerging relationship. Writing of exchanges in general, A. Doak Barnett summarizes what might optimistically be said about the longer-term value of science relations:

> From a longer-run perspective … the political symbolism of exchanges is not what is most important about them. Their real significance derives from the fact that they provide one of the most important means to establish genuinely meaningful contacts of potentially lasting significance between the two countries … It would be naïve to expect that such contacts will predetermine the character of future official relations between the countries. But over time, they should have some influence on national attitudes and national policies, indirectly if not directly. In the very long run they will be a major factor determining the depth of the relationship that can eventually be developed between the two societies.[67]

By advocating for and giving substance to policies of rapprochement, there is little doubt that the community of scientists and scholars in China and the United States contributed greatly to the ideal of finding common ground and building bridges, of which President Nixon spoke twenty years ago. In the longer run, the strength and utility of these bridges will surely be tested as both sides respond to new challenges in the bilateral relationship.

ENDNOTES

1. Many of China's preeminent scientists had been trained in the United States in the 1930s and 1940s, before bilateral relations were severed in 1949.
2. From 1972–1975, the CSCPRC arranged 90 percent of Chinese scholars' visits to the United States. During the same period, the CSCPRC arranged only 25 percent of U.S. scholars' visits to China. Comparable figures could not be found for the period 1976–1979, but the CSCPRC remained the primary channel for scientific and scholarly delegations from China. "U.S.–China Scholarly Exchanges, 1972–1975." Unpublished fact sheet. (NAS Archives: Delegations and Trips: Frank Press's China Trip. Box 31, P93-262).
3. The meeting was attended by Frederick H. Burkhardt, President, American Council of Learned Societies; Syndey H. Gould, Editor of Translations, American Mathematical Society; John H.M. Lindbeck; Mark Mancall, Department of History, Harvard University; Kenneth W. Morgan, Professor of Religion, Colgate University; Robert B. Sheeks; and Kenneth T. Young, President, the Asia Society. (CSCC Archives: George Washington University, Washington, DC.)
4. From mid-1964 to mid-1966, it had been relatively easy for the non-American Westerner to visit China. Several Western scientists had traveled to China as tourists. There were also scientific exchanges between the Royal Society of Britain and the Chinese Academy of Sciences (CAS), the Royal Swedish Academies of Science and CAS, and between the French and Chinese governments, and there were official visits to China by scientists from Canada, Australia, and many other Western countries. Meetings between American and Chinese scientists took place only in third countries. See C.H.Geoffrey Oldham, "The Cultural Revolution: New Prospects for Chinese Science," *Technology Review* 71 (Oct./Nov. 1968): 23–29.
5. Agenda Paper for the Second Meeting at the Century Club, New York, November 24, 1964. (NAS Archives: ADM:IR:PSB:CCMC:Proposed.) Acknowledging the tensions in U.S.–China relations, minutes of the discussion note that "academic efforts to test Chinese intentions run the danger of the Chinese interpreting all moves as political in motivation."
6. At the 1963 Annual Meeting of the NAS Pacific Science Board, it was recommended that there be formed an NAS subcommittee to report to the Academy on the current state of scientific achievement in the PRC; to consider the possibilities, merits, and risks of broadening scientific communication directly or indirectly with Chinese scientists and institutions; and to consider how communication might serve the scientific and other interests of the Academy. See NAS Archives, Washington, DC: Council of the Academy: Meetings: Agenda: Item, 5 June, 1965.
7. John H.M. Lindbeck to Harrison Brown, Cambridge, MA, 29 January 1965. (NAS Archives: ADM: IR:PSB:CCMC:Proposed: Inquiry.)
8. The nine were Robert Blum, Council on Foreign Relations; Frederick H. Burkhardt; Syndey H. Gould, Editor of Translations, American Mathematical Society; John H.M. Lindbeck; Mark Mancall; William W. Marvel, President, Education and World Affairs; Kenneth W. Morgan; Robert B. Sheeks; and Kenneth T. Young.
9. John M.H. Lindbeck to Harrison Brown, 29 January, 1965, p. 3. (NAS Archives: ADM:IR:PSB:CCMC Proposed: Inquiry)
10. Minutes of NAS Council Meeting, February 6, 1965, p. 11. (NAS Archives: ADM:IR:PSB:CCMC: Proposed.) At the official level, there was little support for a policy of accommodation toward the PRC until after Nixon became president in 1969.
11. Harrison Brown to Herman Pollack, Washington, DC, October 20, 1965. (NAS Archives: ADM:IR:PSB:CCMC:Proposed.)
12. W. Murray Todd to Harrison Brown, Washington, DC, May 11, 1966. (NAS Archives: ADM:IR:CSCMC: Joint ACLS & SSRC: Views of Royal Society.) The United Kingdom was the first major Western European nation to recognize the PRC, on January

6, 1950 (although the PRC did not recognize the United Kingdom until 1954, and the two countries did not establish full diplomatic relations until March 1972, when London accepted the PRC's position on Taiwan).

13. Although the worst was over by 1969, the Cultural Revolution period is generally considered to have lasted until 1976, the year of Mao's death.
14. Oldham, "The Cultural Revolution."
15. Richard P. Suttmeier, "Science Policy Shifts, Organizational Change and China's Development," *The China Quarterly* (June) 1975: 227.
16. Harish Kapur, *Distant Neighbours: China and Europe*. (London and New York: Pinter Publishers, 1990) p. 85.
17. Vincent Collet, as reported in Department of State Airgram, October 29, 1971, CSCC Archives, George Washington University, Washington, DC: Exchanges/Scientific 71.
18. S.L. Kwee, "The Possible Impact of the Chinese Cultural Revolution," Seventeenth Pugwash Conference on Science and World Affairs, Ronneby, Sweden, 3–8 Sept. 1967. (NAS Archives: ADM:IR:OFS:CCMC Gen. Box 5 91-048-1.)
19. In November 1966, John Taylor spent three days in Cambridge, MA, meeting with scholars and scientists at Harvard and MIT to determine how they viewed prospects for the CSCMC. In early 1967, he also met with scholars in several European countries to discuss the Committee and its aims. The results of his meetings were discouraging. Few believed that the CSCMC could make any headway with China. Memo, John Taylor to Harrison Brown, December 5, 1966. (NAS Archives: ADM:IR:CSCMC67:Reports: Taylor Trip. Box 91-048-1, Loc. B22-O1A-2205A.)
20. Statement by Assistant Secretary Green Before the Subcommittee on Asian and Pacific Affairs, Committee on Foreign Affairs, House of Representatives, October 6, 1970. Page 292 in *Hearings before the Subcommittee on Asian and Pacific Affairs of the Committee on Foreign Affairs House of Representatives, Ninety-first Congress, Second Session, Sept. 15,16,22,23,24,29, and 30; October 6, 1970.* Washington, DC: Government Printing Office.
21. China's decision to resume these talks was attributed to the fact that border talks between the China and the Soviet Union were not going well.
22. George Sprague, "Importance of Ties in Agriculture," in Anne Keatley, ed. *Reflections on Scholarly Exchanges with the People's Republic of China* (Washington, DC: Committee on Scholarly Communication with the People's Republic if China, 1978), pp. 28–29.
23. *Science News*, 99, 9 (May 8, 1971),: 313. Later in the year, a delegation attended the McGill University Sesquicentennial Conference.
24. It was speculated that China's motivation was its desire to improve public opinion and to gain support for admittance to the United Nations. The United States removed the last restrictions to travel to the PRC on March 15, 1971.
25. In 1980, STAPRC was renamed the China Association for Science and Technology (CAST).
26. (Personal communication, Li Mingde, May 30, 1996 and January 7, 1997). China may have been favorably disposed toward Galston and Signer's request to visit because of Galston's public criticism of the U.S. involvement in Vietnam and his studies of the effects of U.S. defoliation programs. A month later, a group of American students of China studies were allowed to visit China from Hong Kong, the second large group of Americans to enter China since 1949. The students had applied for visas as representatives of the Committee of Concerned Asian Scholars, which had also taken a public stand against the war in Vietnam. (*The New York Times*, 24 June 1971).
27. *FAS Newsletter*, 25, 5 (June 1972): 1.

28. The letter probably referred to the Administration's lifting of prohibitions on travel to Mainland China by U.S. scholars, students, scientists, physicians and news reporters, announced in July 1969. On March 15, 1971, the prohibition was lifted for the general public.
29. CSCMC Minutes of Executive Committee Meeting, 4 January, 1971. (NAS Archives IR:OFS: CSCPRC71:Executive Ctte. Mtg. 1-4-71. Box 4, 91-048-1).
30. Memo, Anne Keatley to Philip Handler, July 21, 1971. (NAS Archives, CSCPRC Administration 1972: President's Office. Box 4, 91-048-1.) In correspondence from this period, Zhou Enlai is referred to as Chou En-lai because a different system of romanization was used.
31. In 1971, the Carnegie Corporation and the Hazen Foundation remained the two funders of the CSCPRC.
32. "China Welcomed a U.S. Scientist," *The New York Times*, 23 August 1971.
33. Notes from telephone conversation, Harrison Brown to Yang Chen-ning., August 23, 1971. (NAS Archives ADM:IR:OFS:CSCPRC:Indiv:Yang Chen-ning. Box 4, 91-048-1.)
34. *Chemical and Engineering News* (Dec. 4, 1972), p. 21; "Scholarly Exchanges with the PRC, 1971–72," *China Exchange News*, 1, 1 (Spring 1973) : 2.
35. Anne Keatley to Philip Handler, Harrison Brown, and Emil Smith, May 8, 1972. (NAS Archives: CSCPRC Admin: 1972: President's Office. Box 4, 91-048-1.)
36. Dr. Zhang Wenyu, deputy director of the Institute of Atomic Energy in Peking, lectured and conducted research from 1944 to 1956 at Princeton and Purdue universities and returned to China in 1956. Chang was thought to be among the leading Chinese scientists involved in nuclear weapons research. Dr. Qian Renyuan, a senior scientist at the CAS Institute of Chemistry, was one of China's leading polymer chemists. Qian had earned his Ph.D. in physical chemistry from the University of Wisconsin in 1946. Dr. Qian Weichang, professor of mechanics, had served both as vice president of Tsinghua University and as director of the CAS Institute of Automation and Remote Control. After receiving a Ph.D. from the University of Toronto in 1942, he worked as a research engineer for the Guggenheim Jet Propulsion Laboratory of the California Institute of Technology until he returned to China in 1949. *Chemical and Engineering News* (Dec. 4, 1972): 21.
37. Anne Keatley, Report of Visit by Science Delegation from the PRC, Nov. 20–Dec. 15, 1972. (NAS Archives: CSCPRC Admin:1972:President's Office. Box 4, 91-048-1.)
38. Ibid.
39. Personal communication, Li Mingde, May 30, 1996.
40. CSCPRC background sheet, November 15, 1972. "Survey on Science Exchanges with the People's Republic of China." (CSCC Archives: Background Info./U.S.-PRC Exch/Science 72, yellow.)
41. Charles P. Ridley, *China's Scientific Policies: Implications for International Cooperation,* AEI-Hoover Policy Study No. 20. (Washington, DC: American Enterprise Institute, 1976), p. 78.
42. Ibid.
43. Kissinger had visited China in June 1972 to follow up on the Nixon visit of February 1972. Discussions included plans for academic exchanges. The Chinese, however, were still noncommittal.
44. The paper noted that ambassadorial negotiations in Paris should not try to predetermine the exact form or content of exchanges, but that they should be left to the private institutions actually involved. Noting that no U.S. organization, public or private, should become the exclusive channel for communication with the PRC, the paper recommended that at least two national organizations be designated to serve as intermediaries between American and Chinese individuals and organizations.

The paper also recommended that the fields of exchange, numbers, types, and contacts not be subject to strict symmetry. (NAS Archives CSCPRC Admin:1972: Position Paper for DOS and White House. Box 4 91-048-1.)

45. Tsuchitani, Patricia Jones. "Scientific Exchanges Between the United States and the People's Republic of China, 1972-1978." Unpublished paper. NAS Archives: Delegations and Trips: Frank Press's China Trip. Box 31, P93-262.)
46. Because the CSCPRC could be viewed as an organization separate from NAS—insofar as it had three sponsors—the decision to sign an agreement with the CSCPRC may have been less difficult, politically, than it might have been if the CSCPRC were wholly an NAS activity.
47. *Chemical and Engineering News* (July 9, 1973) :11.
48. John Garder, "The Gang of Four and Chinese Science," *Bulletin of the Atomic Scientists* 33, 7 (September 1977): 24-30.
49. Ibid.
50. U.S. Advisory Commission on International Educational and Cultural Affairs. "A Necessary and Noble Task." The Eleventh Report of the U.S. Advisory Commission on International Educational and Cultural Affairs, June 1975. CSCC Archives, George Washington University, Washington, DC: Background Information/U.S.–PRC Exch/General 75.
51. Ibid, p. 22.
52. CSCPRC 1976 Exchange Program Negotiations Discussion Paper, December 31, 1975. NAS Archives, Washington, DC (ADM:CIR:CSCPRC 1976:Documents:Official:Papers Prepared by CSCPRC. Box 28, acccession 93 262a.)
53. Yang Chen-ning, "What Visits Mean to China's Scientists," in Keatley, *Reflections on Scholarly Exchanges*, p. 20.
54. Among the "crimes" was the charge that the Gang had been responsible for the huge loss of life during the Tangshan earthquake in the summer of 1976 because they had ignored the warnings of professional seismological institutes and failed to evacuate the area. *People's Daily* (March 9, 1977).
55. *The New York Times*, March 14, 1977.
56. *Science*, 201, 11 (August 1978): 513.
57. Mary Brown Bullock, CSCPRC Staff Director's Report, p. 2, December 1977. (NAS Archives:ADM: OIA:CSCPRC 77. Box 28 93-262a.)
58. Ibid, p. 2.
59. Ibid, p. 6.
60. Frank Press had served as chairman of the CSCPRC prior to his appointment to OSTP.
61. Memo, Pierre Perolle to John Lewis *et al*., Aug. 4, 1978. (NAS Archives: GOVT:CIR:CSCPRC 1978: Inter-Agency Task Force. Box 30 93-262b.)
62. "Proposal for Sending American Students to China." Ibid.
63. Politically, China was ready to bend on the Taiwan issue. In December 1978, U.S. Liaison Office Chief Leonard Woodcock and Deputy Foreign Minister Han Nianlung agreed that China would not contradict U.S. assertion that it had a continued interest in the peaceful resolution of the Taiwan question. *The New York Times,* December 31, 1978, p. A1.
64. John Richardson, Jr., "Exchanges in the Process of Normalization: U.S. Government Perspective" in Anne Keatley, ed., *Reflections on Scholarly Exchanges* (Washington, DC: Committee on Scholarly Communication with the People's Republic of China, 1978), pp. 44–45.
65. Personal communication, Beijing, May 30, 1996.
66. Keatley, *Reflections on Scholarly Exchanges*, p. viii.
67. A. Doak Barnett, "Exchanges in the Process of Normalization: Views of the Academic Community" in Keatley, *Reflections on Scholarly Exchanges,* pp. 45–50.