

The Nuclearization of Iran in the Seventies

The sight of soaring, unrelenting peaks, fading beyond number into the distance, intimidated the English physicist Walter Marshall in February 1975. From an airplane, Iran seemed like an impenetrable country. Jotting down notes, Marshall was unable to avoid words such as “staggered” and “astonished” as he beheld Iran’s formidable terrain. It was hard not to compare what he saw, in the sublime grandiosity of the natural landscape, with what he had just experienced on the ground in Tehran. The magnitude—and opportunity—of the task ahead overwhelmed him. He had visited Iran to solicit some business for Britain’s atomic energy research establishment at Harwell, and had come away with a long shopping list and an invitation from the Shah of Iran, Mohammed Reza Pahlavi, to help create a new energy future for millions of people. It would mean helping to implement dozens of nuclear reactors across some of the rockiest, inaccessible, seismically active, inhospitable countryside in all of Asia. It would take time, people, expertise, and material—and bring in millions of British pounds. Marshall had just come from a conversation at the Atomic Energy Organization of Iran (AEOD), and his counterpart there had made clear that for the Shah, money was no object.¹

The first moment of Iran’s extraordinary nuclear ambition had arrived. In the seventies, the Shah decided to invest huge sums of petroleum dollars into building dozens of nuclear power plants across his country. In 1970, Iran ratified the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), which affirmed its rights of access to nuclear fuel and technology as long as it foreswore building nuclear weapons. The Shah embraced the idea with relish and opened negotiations with European and American firms to build an extensive network of reactors, to operate them safely, and to secure fuel. By the year 2000, Iran was supposed to have its electricity grid firmly anchored in nuclear power.² Instead, that nuclear moment glittered brightly for half a decade before it faded.

1. W. Marshall, Note for the Record of a Visit to Iran from 4th–6th February, 1975, UK National Archives, AB 65/1066.

2. For a brief outline of the technical and legal history and recent status of Iran’s nuclear programs, see the International Atomic Energy Agency’s “Iran Nuclear Power Profile,” <http://www-pub.iaea.org/MTCD/publications/PDF/cnpp2009/countryprofiles/Iran/Iran2008.htm>. (accessed January 4, 2013).

Then Iran's nuclear ambitions wandered, as if lost in the vast central Asian terrain, through a complex history that has yet to see its end. The Iranian Revolution of 1978–1979 halted cooperation between Iran and nuclear supplier nations, but more than a decade later the Islamic Republic of Iran reinvigorated its nuclear program. Today the story is far from uncontroversial: Iran has endured economic sanctions, it has been accused of building a nuclear bomb, it is routinely cited by the International Atomic Energy Agency (IAEA) for reporting infractions, and it made the shortlist in former U.S. President George W. Bush's so-called "Axis of Evil."³

The role of the West⁴ in the early years of Iran's turn toward nuclear technology, referred to here as Iran's nuclearization, remains deeply contested. In the present essay, "nuclearization" includes not only building nuclear reactors but also investments in research, nuclear facilities at home and abroad, educational infrastructure, and the training of Iranians in nuclear fields. Most commentators have accepted that the impetus for these efforts came from the Shah, but they are divided on how Westerners handled the issue of proliferation. Many argue that proliferation did not become a serious issue until after the Iranian Revolution, and that the United States had hoped to accommodate the Shah's desires in order to strengthen relations with an important ally in the region. This perspective has become a key feature of claims that the West maintains a double standard that discriminates against the current Iranian regime.⁵ Others claim that the West attempted to fulfill its NPT obligations while working to limit proliferation in these early years. One such author suggests that while the Europeans were eager to sell nuclear technology to Iran, the Americans were initially reluctant to fulfill the Shah's wishes because of concerns about nuclear proliferation.⁶ Another author, William Burr, used recently-released State Department documents to show that the Nixon, Ford, and Carter administrations spent many years trying to ensure that the deals struck with Iran included safeguards against weapons proliferation. He points out that this contradicts Secretary of State Henry Kissinger's later statement that the deals were primarily commercial, with little attention to proliferation. In Burr's telling, the Shah of Iran instigated the programs and

3. Mustafa Kibaroglu, "Good for the Shah, Banned for the Mullahs: The West and Iran's Quest for Nuclear Power," *Middle East Journal* 60, no. 2 (2006): 207–32; John Barry and Russell Watson, "Analyzing the 'Axis of Evil,'" *Newsweek* 139, no. 6 (2002): 26–27.

4. I say "West" as shorthand, but more specifically this refers to the United States, Britain, France, the Federal Republic of Germany, Italy, and Japan—the original members of the "Group of Six" economic powers.

5. Concise overviews of these perspectives, include David Patrikarakos, "How Iran Went Nuclear," *New Statesman* 138, no. 4954 (2009): 26–33; and Mahummad Sahimi, "Forced to Fuel: Iran's Nuclear Energy Program," *Harvard International Review* 26, no. 4 (2005): 42–45.

6. For a perspective seeing the United States as reluctant, see Abbas Milani, "The Shah's Atomic Dreams," *Foreign Policy* (December 29, 2010), http://www.foreignpolicy.com/articles/2010/12/29/the_shahs_atomic_dreams (accessed January 4, 2013).

these administrations attempted to accommodate Iran but were deeply concerned to halt potential weapons proliferation.⁷

Although it is laudable for historians to show how proliferation was under discussion in the seventies, rather than purely a problem under the later Islamic Republic of Iran, looking at the wider context of the West's economic strategy during the petroleum crisis yields a different picture of these administrations' aims and those of key economic allies such as the Group of 6. It is true that Nixon and Ford had to contend with the proliferation issue, but it was not their primary motivation; in fact, their aims were hindered by those who took a hard line on proliferation. Together, European and American scientists and diplomats went out of their way to engage Iran and to encourage it to build a nuclear-intensive future. The nuclearization of Iran was not merely a case of accommodating the Shah's wishes. Western diplomats and scientists convinced their Iranian counterparts to make a series of costly investments that turned out to be blunders for Iran, but that ultimately laid the foundation of Iran's controversial nuclear community. I make this claim by outlining three general points. First, Western nations used the promises of the NPT in order to encourage Iran to commit itself to long-term capital expenditures in the nuclear realm, as a coordinated strategy for breaking the power of the petroleum cartel. Second, the politics of nonproliferation unexpectedly hindered Western governments' plans to use the NPT in this way. Third, parties on both sides only gradually learned that Iran's goal of creating a knowledgeable nuclear community in Iran had become incompatible with the Western interpretation of the NPT as it solidified in the mid-seventies.

BREAKING THE CARTEL

The nuclearization of Iran was a direct result of the petroleum crisis of the seventies. Historians already regard the oil embargo of 1973, and subsequent shortage of supply, as a defining moment for U.S., European, and Japanese energy policies. When some members of the Organization of Petroleum Exporting Countries (OPEC) reduced petroleum production, and some members embargoed major consumers, they did so as a punitive move in response to supporting Israel in the 1973 Yom Kippur War. The French and British already had felt similar pressure in 1957 during the Suez crisis, and both countries' enthusiasm for nuclear power intensified in the seventies. Likewise, the Japanese began to focus on nuclear power during these years, as did the Federal Republic of Germany.⁸

7. William Burr, "The History of Iran's Nuclear Energy Program," *Bulletin of the Atomic Scientists* (2009), <http://www.thebulletin.org/web-edition/op-eds/the-history-of-irans-nuclear-energy-program> (accessed December 18, 2012).

8. An overview of the oil crisis, including a discussion of nuclear power, is in Francisco Parra, *Oil Politics: A Modern History of Petroleum* (London, 2004).

Perhaps surprisingly, the seventies were also years of enthusiasm for nuclear power in oil producing countries. Despite sitting on top of enormous supplies of petroleum, Iran embarked on what seemed like an energy revolution in the mid-seventies. American nuclear power advocates even circulated an advertisement picturing the Shah, titled “Guess Who’s Building Nuclear Power Plants,” arguing that if the Shah felt nuclear solutions were safe and economical, others should too.⁹

These developments would have seemed comical just a few years earlier. At the start of the decade, Iran’s nuclear physics community was an object of derision, being quite small and with very few trained scientists. Iran had only the rudimentary experimental tools that had been encouraged throughout the sixties by the IAEA. The first was a “swimming pool” research reactor, built by American Machine and Foundry as recently as 1967. Such reactors were relatively easy to use and could be found in universities around the world. The second was a radioactive source, Cobalt-60. With this source, contained in a lead-lined box with a small door, scientists could study the impact of gamma radiation on any object, such as plants, animals, air, water—whatever a scientist might imagine. Because it was cheap to construct, and the cobalt could be acquired easily through the IAEA, it was one of the most common “nuclear” tools found in developing countries. Iran’s cobalt source had been set up only in 1971.¹⁰

Iran’s nuclear ambitions changed dramatically during the oil crisis. OPEC countries had unprecedented economic and diplomatic power, and individual oil consuming countries began to cut bilateral deals to try to establish good relations and ensure access to oil. The French, for example, had great success promising Mirage fighter planes in return for oil, and other countries tried to broker arms deals as well. High technology seemed to be what the big oil consumers had to offer, and they found Middle East leaders eager to snatch it up. As one U.S. embassy official in Iran noted in 1973, “the latest supersonic jet fighters and most advanced military technology function as the mosques and monuments of past Persian dynasties. They are the marvels that are intended to dazzle Iran’s neighbors with the power and prestige of the Pahlavi line.”¹¹ In Iran and its neighbors, the control of petroleum exercised by Middle East governments and/or ruling families meant that these countries could open their deep pockets for foreign investment. Europeans, Americans, and the Japanese tried to use their access to high technology as a means of strengthening economic ties with the Middle East.

9. The advertisement is ubiquitous on the internet, and exists on <http://upload.wikimedia.org/wikipedia/en/1/1c/Shah-nukeIran.jpg> (accessed January 3, 2013).

10. Atomic Energy Organization of Iran, Nuclear Research Center, “Progress Report, July—September 1976,” October 1976, AEOI-68, NRC-76-41, UK National Archives, AB 48/1530.

11. Airgram from the Embassy in Iran to the Department of State, January 9, 1973, FRUS 1969–1976, vol. 27, 9.

Among Americans, Secretary of State Henry Kissinger in particular saw in this desire for high technology a major strategic opportunity. Kissinger believed individual deals were problematic because they promised to divide and conquer the oil consumers. He stated that by working together the consumers could weaken OPEC in the long term. Publicly, the United States tried to put on a brave face during the oil crisis, and both Presidents Richard Nixon and Gerald Ford urged Americans to conserve fuel while pushing Project Independence, touted as a kind of Manhattan Project for energy self-sufficiency through research on alternative fuel sources.¹² Behind closed doors, the United States' goal was more direct. As Kissinger put it to President Ford in the summer of 1974, "we have to find a way to break the cartel."¹³

The strategy Kissinger proposed was to tie up Middle East capital in ways that would make future oil embargoes extremely painful for the suppliers. In Kissinger's view, Middle East petroleum states like Iran and Saudi Arabia were powerful only because their huge amounts of uninvested capital freed them to reduce oil production on a whim. The solution, then, was to provide valuable goods and services to Middle East countries that would absorb some or most of their vast unspent wealth. Reducing their capital cushion would ensure that, in a moment of crisis, the Middle East countries would be concerned about the bills they had to pay, and would not so easily reduce their oil production. "What we need to do," Kissinger said privately, "is to preempt the structure of relationships in the area and to develop a flow of benefits which they won't want to lose."¹⁴

Economic development in the Middle East was an important yet cynical element of the strategy. One of Kissinger's ideas, for example, was to promise a fertilizer deal to Saudi Arabia. It made little difference whether the fertilizers were actually needed. Kissinger ridiculed American economic development experts who worked in bodies such as the US Agency for International Development (AID), for putting a target country's needs before American strategy. "The problem is that the United States has a missionary streak," he complained in a meeting with some congressmen on foreign economic policy. "Whenever the Saudis have development projects we send six missions over there to explain to them why they don't need them. To explain why they don't need to spend the money."¹⁵ Kissinger had little

12. For an overview of Project Independence, and an analysis of the oil embargo's impact on the United States, see Federal Energy Administration, *Project Independence: A Summary* (Washington, DC, 1974).

13. Steven G. Galpern, ed., *Foreign Relations of the United States, 1969-1976, vol. XXXVII, Energy Crisis 1974-1980*, (Washington, DC, 2012), 12.

14. Quote is in Galpern, ed., *Foreign Relations of the United States*, 8. On Kissinger's strategies, particularly of linkage, see John Lewis Gaddis, *Strategies of Containment* (New York, 1982); on Kissinger's penchant for realism in diplomacy, see Jeremi Suri, *Henry Kissinger and the American Century* (Cambridge, 2007).

15. Memorandum of conversation, June 10, 1975, in Galpern, ed., *Foreign Relations of the United States, 1969-1976*, 229.

interest in development *per se*, but was greatly interested in linking commodities so that Saudi Arabia would spend some of its capital. Rational economic development was not the State Department's purpose, after all. Serving American interests was. "I need assets in Saudi Arabia," he explained in a cabinet meeting on oil strategy. "I don't give a damn about a well distributed world fertilizer industry. In fact, a badly distributed industry is probably in our interest." The Americans needed leverage, and they needed to establish it with each important country in the Middle East. "If we can put a nuclear plant into Egypt in eight years and do something in fertilizers in Saudi Arabia, then we have a strategy," he said. "Then we have something they don't want to lose. I want a confrontation, believe me. But I need chips."¹⁶

To acquire these diplomatic "chips," Kissinger decided to focus on Iran for a couple of reasons. First of all the United States and Iran already had a strong relationship, with the Americans facilitating the Shah's acquisition of a broad range of military hardware.¹⁷ In what became known as the Nixon Doctrine, President Nixon had stated in 1969 that he expected allies to take care of their own defense requirements, but that the United States would facilitate the acquisition of military equipment. Iran was one of the principal beneficiaries of this attitude, and after Nixon visited Iran in 1972, the Shah had reason to believe that he could acquire everything he wanted from the Americans, short of nuclear weapons.¹⁸ It was true that some Americans disliked the Shah, and during the tough times of the oil crisis, even Treasury Secretary William Simon wished to threaten Iran with crippling sanctions. However, Kissinger refused to treat Iran this way, and privately observed to Simon that the Shah of Iran should not be alienated, as he was "the one non-ephemeral political force in the area."¹⁹ He perceived Iran as a more reliable long-term partner than Saudi Arabia. Kissinger had considerable confidence in the Shah, while he said to President Ford that "the Saudis belong to the most feckless and gutless of the Arabs." Iran had behaved according to its interests rather than participate in OPEC's oil embargo. That kind of pragmatic, *Realpolitik* approach earned Kissinger's respect. "The Shah is a tough, mean guy," Kissinger said. "But he is our real friend. He is the only one who would stand up to the Soviet Union."²⁰

16. Memorandum of conversation, August 13, 1974, in Galpern, ed., *Foreign Relations of the United States, 1969-1976*, 9.

17. Roham Alvandi, "Nixon, Kissinger, and the Shah: The Origins of Iranian Primacy in the Persian Gulf," *Diplomatic History* 36, no. 2 (2012): 337-72.

18. On Iran's acquisition of military hardware from the United States, see Morteza Gharehbaghian, "Oil Revenue and the Militarization of Iran: 1960-1978," *Social Scientist* 15, nos. 4/5 (1987): 87-100. For an overview of the origins of the Nixon Doctrine, see Robert S. Litwak, *Détente and the Nixon Doctrine: American Foreign Policy and the Pursuit of Stability, 1969-1976* (Cambridge, 1984).

19. Memorandum of conversation, August 13, 1974, in Galpern, ed., *Foreign Relations of the United States, 1969-1976*, 4.

20. Memorandum of conversation, August 17, 1974, in Galpern, ed., *Foreign Relations of the United States, 1969-1976*, 12.

The second and more important reason to focus on Iran was that it was the most vulnerable to Kissinger's economic strategy. Unlike Saudi Arabia, with only five million people and no industry to speak of, Iran had more than forty million people and ambitions for major industrial development. Its surplus oil, while considerable, was far less than Saudi Arabia's. It might be possible to swallow up Iranian wealth by enticing the Shah to spend. In a private meeting with congressmen, Kissinger was blunt: "Large scale development projects and other projects will put the Shah, for example, in a position where he must sell oil in order to sustain the commitments he has made." The bigger the projects, the better.²¹

Nuclear power generation became a key part of that petroleum strategy. In early 1974 Kissinger directed the U.S. embassy in Tehran to take steps to strengthen ties between the two countries in economic and technological fields, to supplement the existing political and military cooperation. His first two suggestions were explicitly nuclear, one inviting further investment in breeder reactor technology and the other offering to couple nuclear power plants with water desalinization facilities.²² When former CIA director Richard Helms—then ambassador to Iran—met with the Shah, the two men got stuck on the subject of nuclear power. The Shah "wanted to get down to brass tacks on that right away," Helms reported. Iran had committed to creating the AEOI and putting "a practical man, not just a theoretician" in charge of it. Helms had clearly touched on the right topic, and he reported that the Shah's eyes visibly brightened when certain applications, such as using reactor heat to reduce iron ore, were brought up. Kissinger saw the opportunity too, and told Helms that nuclear power was clearly the area to exploit for increasing collaboration and getting Iran to spend its wealth.²³

Although stated most clearly by Kissinger as an explicit cartel-breaking strategy, this was not a purely American plan. The United States coordinated action through a few key players, meeting in the library of the White House with the heads of state of Britain, France, West Germany, and Japan. Kissinger used the "Library Group," as they were known (soon to become the "Group of Six," or G6, with the inclusion of Italy), to coordinate plans with oil producing states, and together the heads of state agreed to tie up Middle East capital with bilateral deals.²⁴ Such deals would seem natural to the OPEC countries, as individual nations tried desperately to hash out favorable oil prices by promising to build port facilities, send fighter planes, or build nuclear reactors.

21. Memorandum of conversation, June 10, 1975, in Galpern, ed., *Foreign Relations of the United States, 1969-1976*, 228.

22. Telegram from the Department of State to the Embassy in Iran, March 11, 1974, 1969-1976, vol. 27, 173.

23. Telegram from the Embassy in Iran to the Department of State, March 15, 1974, 1969-1976, vol. 27, 176. Kissinger's response is in Telegram from the Department of State to the Embassy in Iran, April 11, 1974, FRUS 1969-1976, vol. 27, 179.

24. On the "library group," and its formative role in subsequent economic summits, see Robert David Putnam, *Hanging Together: The Seven-Power Summits* (Cambridge, 1984).

Coordinating such deals would be paramount. At the 1975 Economic Summit Meeting in Rambouillet, Kissinger presented a broad strategy of linking energy discussions with other commodities such as military exports. When bilateral deals were struck between oil producers and consumers, he said, it would be vital that they be based on coordinated strategy among consumers, lest the OPEC countries dominate them. "It would be suicidal to enter a dialogue without cohesion among the oil importers," he asserted. Although, the G6 leaders did not agree on all matters, they were unified in their desire to decrease the power of OPEC. "If our countries run in different directions they will create a crisis in the industrialized West," German Chancellor Helmut Schmidt agreed, hoping for solidarity. "Our destiny will lie in the hands of a few OPEC leaders rather than in our hands."²⁵

A STAGGERING NUCLEAR FUTURE

American technological leaders got started right away, and had little difficulty loosening Iranian purse strings. Jerome Wiesner, the president of the Massachusetts Institute of Technology (MIT), visited Iran in 1974 and followed up on Ambassador Helms's meeting by discussing with the Shah several ways to bring MIT's expertise to Iranian universities. Wiesner was himself a highly respected scientist, and had served during the John F. Kennedy administration as chairman of the President's Science Advisory Committee (PSAC). Wiesner found in the Shah and Iranian university administrators a mood of "optimism, expansionism and general ebullience," based on Iran's oil wealth. The Shah's eyes seemed to be on speeding up the process of industrialization, and Wiesner established liaison between MIT and the Aryamehr University of Technology to train the first generation of elite engineers. This was not perceived as aid for Iran, but rather as an opportunity to use Iranian capital in a way that could conceivably benefit both countries. Wiesner encouraged MIT faculty to prepare proposals for major international research centers at MIT to be paid for by Iran, including ones on oceanography and geophysics, and a \$50 million energy research laboratory to be housed at MIT. In addition, in a system that would be mirrored by Britain, MIT offered to bring in thirty new Iranian students per year for training in nuclear physics and engineering, in a special master's program for Iran. To make it profitable, MIT would be compensated for each student.²⁶

Neither the Nixon nor Ford administrations—with Kissinger developing foreign policy in both—were fixated how these projects would contribute to nuclear proliferation. However, the proverbial fly in the ointment landed in

25. Minutes of the Rambouillet Economic Summit Meeting, November 16, 1975, Memorandum of conversation, June 10, 1975, in Galpern, ed., *Foreign Relations of the United States, 1969-1976*, 318.

26. Stuart W. Leslie and Robert Kargon, "Exporting MIT: Science, Technology, and Nation-Building in India and Iran," *Osiris* 21 (2006): 110-30. Quote p. 125.

May 1974, when India detonated a nuclear device, widely dubbed the “Smiling Buddha” explosion. Although India insisted it was a peaceful nuclear explosion (PNE), it generated global controversy and altered proliferation politics in the West, putting such concerns in the minds of citizens more than ever before. Although Iran was a signatory to the NPT (India was not), many were critical of collaborating with the AEOI on nuclear matters. After India’s test, the Shah made some ambiguous remarks about his own nuclear ambitions, but denied that Iran planned to have a bomb soon.²⁷ Was it wise to have the most elite American scientific and technological university on Iran’s payroll, providing its scientists with nuclear expertise? Those concerns emanated from students and faculty at MIT, who protested the university signing nuclear collaboration contracts with Iran, and they even organized a sit-in protest. In response, MIT administrators argued that it was better to be an “insider” in Iran, and to train Iranians according to American standards, than to be shut out of what Iran might do anyway. MIT certainly had a great deal to gain financially from these deals, and the U.S. State Department did not attempt to interfere—indeed it would not have, given Kissinger’s strategy of encouraging precisely what MIT was doing. MIT’s Draper Laboratory (a center of excellence for missile guidance technology) was negotiating a similar relationship with the same Iranian university.²⁸

While the Americans courted Iranian dollars for MIT, the British attempted to do the same for the Atomic Energy Research Establishment at Harwell. The British Foreign and Commonwealth Office encouraged Harwell to improve relations with their counterparts in Iran, and to see if they could offer any commercial deals. The key figure in establishing cooperation was the nuclear physicist Walter Marshall. A brilliant star of mathematics, Marshall had earned his Ph.D. at the young age of twenty-two, working on neutron scattering and mentored by Manhattan Project veteran Rudolf Peierls. He spent much of his career as a theoretical physicist at Harwell, becoming its director in 1968. Colleagues described him as a man who knew his worth and could be overbearing, “a self-confessed workaholic who enjoyed the exhilaration of power.”²⁹ He would find a lot to be exhilarated about in Iran.

Encouraged by British diplomats, Marshall visited Iran, Kuwait, and Algeria in early 1975, and the British thereafter reached out to Egypt, Saudi Arabia, and Libya. It was in Iran that Britain found a community ready and willing—far beyond expectations—to become nuclear partners on a grand scale. And it was a community with access to money. By that time the AEOI’s director, Akbar E’temad, ran a fiefdom dedicated to nuclear power, having inherited the limited

27. “Iran Says She Has No Intention to Develop Nuclear Weapons,” *New York Times* (June 25, 1974), 3.

28. Leslie and Kargon, “Exporting MIT,” 127.

29. D. Fishlock and L. E. J. Roberts, “Walter Charles Marshall, C. B. E., Lord Marshall of Goring, 5 March 1932–20 February 1996,” *Biographical Memoirs of Fellows of the Royal Society* 44 (1998): 298–312.

toolkit of a small nuclear institute (and its reactor) at Tehran University. E'temad was deep into negotiations with several countries for reactors, fuel, and expertise. The British jumped in with both feet, working through a company owned by the UK government, British Nuclear Fuels Limited (BNFL), which had been created in 1971 to handle the commercial side of the nation's nuclear program. BNFL proposed several projects to Iran (and to Kuwait) that drew from Britain's existing expertise, including geological exploration for uranium and developing nuclear safety standards. "The basic idea of this seems fairly clear," an official reported, "simply to match up Iranian money with BNFL expertise and management ability."³⁰

The British scientists initially were overwhelmed by the magnitude of the opportunity in Iran, but British diplomats strongly encouraged them to move forward. Conducting a geological survey for domestic sources of uranium would itself be a large contract because the mountainous terrain would mean aerial surveys, estimated to cost Iran more than £10 million. The figure did not bother the Iranians because the Shah himself had ordered the uranium survey to be done. Similarly, because of the prevalence of earthquakes in Iran, a seismographic network would be necessary, which meant contracting someone to set up instruments in fifty to a hundred remote locations throughout Iran. Because other countries such as Germany and France had offered to build reactors—while insisting that they would leave it to Iran to make sure they were operated safely—Iran looked to Britain as a reliable partner on reactor safety.

Above all the Iranians hoped to create a well-informed nuclear community. Without Iranian scientists and engineers, Iran would become dependent on foreign experts, just as it was dependent on foreign reactor fuel. Under E'temad the AEOI planned to hire Iranian citizens to work in its facilities after first sending them to get undergraduate degrees in American, British, French, or German universities, and preferably after a few years of working in those countries in nuclear fields. Iran sought a broad range of partners, not wishing to become beholden to the United States or any other single major power, a move that was in keeping with Iranian diplomacy through much of the mid-twentieth century.³¹ In Britain, Iran offered to pay for post-undergraduate training on a large scale, suggesting support for about a hundred Iranians per year at Harwell—yet another lucrative opportunity for existing nuclear establishments. Indeed Iran was offering more money than Harwell knew what to do with, compelling it to consider constructing new buildings on site just to make room for the influx of

30. Marshall, Note for the Record of a Visit to Iran from 4th–6th February, 1975.

31. Iran's efforts to strengthen its negotiating position by keeping options open with a variety of partners are clear in Mark Hamilton Lytle, *The Origins of the Iranian-American Alliance, 1941-1953* (London, 1987). Several authors have noted how Iran's need to balance competing pressures of major powers has also led to negotiating opportunities. See, for example, Shahram Chubin and Sepehr Zabih, *The Foreign Relations of Iran: A Developing State in a Zone of Great-Power Conflict* (Berkeley, 1975).

Iranian trainees.³² For Harwell it was a win-win situation: “The payments to Harwell for this training will fully recover the gross commercial costs with profit, and there should be further benefit from the use of the manpower provided.” Harwell projected profits of some £1.5 million in the coming few years from its deals with Iran and Kuwait.³³

Reporting on these conversations, Marshall used words such as “astonished” and “staggered” to describe his reaction to the magnitude of Iran’s ambitions and the great potential for British commercial and diplomatic relations. After debriefing with the British embassy in Tehran: “the embassy were particularly pleased at the whole sense of the discussion which showed that the UK was moving toward the position of being general adviser to the Iranian Government on science and technology—this is something they strongly welcome and keenly encourage.”³⁴

As these negotiations moved forward, all parties maneuvered to avoid raising proliferation concerns. Although the Indian explosion had heightened concerns, there seemed no reason to imagine that Iran, as a signatory of the NPT, would need to rethink its plans. From the documents available in British archives, reflecting conversations with E’tamad at the Iranian nuclear establishment, it is clear that E’tamad was deeply concerned that Iran’s actions might be misinterpreted, and raise alarms about proliferation. Time and again we see in the documents E’tamad being reassured on this point.³⁵

During this period of anxiety about proliferation the Iranians made some poor decisions that would haunt Iran later, particularly the decision to invest in infrastructure outside Iran to ensure its own access to enriched uranium. Iran did not wish raise an alarm by building such a facility on Iranian soil. However, this was a political decision, not a legal one. French negotiators convinced Iran to build its enrichment facility in France, and the decision turned out to be a serious blunder for Iran, tying up considerable sums of capital. France promised to build reactors in Iran, but first requested an enormous loan to build a gaseous diffusion plant in France. Iran agreed in 1974 to put up the money—some \$1 billion—for an enrichment facility, which would then offer services to a holding company in which the Iranians had a partial stake, with the French state-owned company Cogema having the majority share. Iran would have the right to buy some of the enriched uranium. That Franco-Iranian company was called Sofidif (*Société franco-iranienne pour l’enrichissement de l’uranium par diffusion gazeuse*). The Iranian share was watered down because Sofidif was itself part of Eurodif (“dif” for gaseous diffusion), a consortium of Europeans stockholders. Iran’s share in the whole operation, despite having put up the money for the diffusion

32. Marshall, Note for the Record of a Visit to Iran from 4th–6th February, 1975.

33. “Discussions with Middle East Countries,” n.d., UK National Archives, AB 65/1066.

34. Marshall, Note for the Record of a Visit to Iran from 4th–6th February, 1975.

35. *Ibid.*

plant, was only ten percent. This was a great deal, commercially, for the European stockholders. It was particularly good for France, which was able to secure its own enrichment future with external money, and have the facility at home, in the southern provincial village of Pierrelatte. Most importantly, the project absorbed an enormous amount of Iranian capital and gave France some leverage in its negotiations with Iran in any future oil crisis.

E'temad's attitude was that Iran's best strategy to avoid future manipulations by Westerners was to create a community in Iran that was knowledgeable about nuclear affairs. While having a Iranian-European holding company such as Eurodif was useful for procuring uranium enrichment services without raising geopolitical concerns, it was also useful for a totally different reason: it gave Iran access to important scientific, business, and engineering communities. E'temad told British scientists such as Marshall in 1975 that he was interested in purchasing enrichment services in any way "which made Iran a knowledgeable customer." He hoped to send Iranians to work in a British centrifuge facility. Participation in such companies went far beyond scientific knowledge. They did not just want to know how gaseous diffusion worked, or how centrifuges worked. They wanted to know how to run entire enrichment facilities, so they might one day build one in Iran. As one British report had it, E'temad "wants to get to know the operation, the problems, the marketing strategy and general knowhow of managing and building a centrifuge plant." Even if they could not control a holding company like Eurodif, they still wanted access to its day-to-day business operations.³⁶ Iranians such as E'temad believed that this strategy was a way to ensure a seamless flow of uranium enrichment services, and it would have the added benefit of broadening Iran's own knowledge base.

In negotiations, the Iranians made their goals crystal clear: to have a very large nuclear power program and to secure their own future uranium supplies. Their plans were ambitious, to have about 24,000 megawatts of electricity capacity in place by 1994. That meant a twenty-year plan that committed them to ordering two pressurized water reactors per year. By early 1975 they had ordered four, from German (Kraftwerk Union) and French (Creusot-Loire) companies. Despite such a wide-ranging commitment to peaceful uses of nuclear energy, Iran still had difficulty getting companies to supply it with uranium. This put into sharp focus how powerless Iran was to negotiate good deals for uranium enrichment, and made Iranian officials wonder why they had agreed to build the enrichment facility in France, not Iran. After speaking to E'temad about the problem, a British official said "they were almost paranoic [sic] about the supply of uranium to Iran in the future."³⁷ Having signed the NPT was Iran's only guarantee that access could not be blocked, but Iran was increasingly concerned that even the NPT would not be enough.

36. Ibid.

37. Ibid.

Iran was correct that the NPT would not be enough, though Western partners were slow to admit it. In the wake of India's "Smiling Buddha" explosion, several countries formed the Nuclear Suppliers Group, and started to renegotiate what they collectively would require in nuclear deals. These would be additional safeguards that would have to be written into each bilateral nuclear agreement. In the fine print of each deal, the firms seemed to want signed guarantees about what their partners could or could not do, and they demanded mechanisms of enforcement. Would Iran need to sign such agreements? Unlike India, Israel, Egypt, and others, Iran already had signed the NPT, and it stood to reason that Iran would not be compelled to sign additional agreements. One could argue, as the Shah did, that the NPT ensured Iran's right to access. He did not wish to be encumbered by additional legal language beyond the treaty itself. Separate agreements would either be redundant, Iranian negotiators said, or could include stipulations not intended by Iran when signing the NPT. It remained to be seen if the Shah would refuse to sign, putting an end to these nuclear deals and thus killing the hopes of Western governments to use nuclear technology to absorb Iranian capital.

As these nonproliferation stipulations had not been in Kissinger's initial plan, the Americans had new problems trying to close the deal with Iran. Kissinger in particular hoped the Shah would not overreact to the changing politics in the West, which seemed to require as many protocols for signers of the NPT as for nonsigners. He knew Congress would want specific items in a bilateral agreement that had not been raised before with the Shah or with E'temad at the AEOI. Specifically, in light of media concerns about proliferation, the US wanted a veto over what happened to the plutonium produced from U.S.-supplied reactors, an agreement about preventing theft, and—after the embarrassing Indian "peaceful" nuclear test—an explicit statement that there would be no peaceful explosions.³⁸ These proliferation politics became an annoyance for Kissinger, who perceived them as hindering his plans to increase collaboration. Kissinger hoped that these political pressures would not derail the petroleum plan, which depended on Iran spending down its surplus wealth on big-ticket items like nuclear reactors. One State Department memo, on strategies for putting these stipulations into a binding contract with Iran, stated that key Congressmen and Senators had already been promised that there would be such additional bilateral provisions going beyond the requirements of the NPT. Kissinger scrawled in the margin, tellingly, "Why did we do this?"³⁹

38. Telegram from the Department of State to the Embassy in Iran, June 28, 1974, 1969-1976, vol. 27, 203.

39. Action Memorandum from the Assistant Secretary of State for Near Eastern and South Asian Affairs (Atherton) and the Acting Assistant Secretary of State for the Bureau of Oceans and International Environmental and Scientific Affairs (Sievering) to Secretary of State Kissinger, December 6, 1974, FRUS 1969-1976, vol. 27, 275.

FORBIDDEN SCIENCE AND TECHNOLOGY

Still hoping for the best, Kissinger could report to the president in March 1975 that “the Iranian stuff is going very well.” They had agreed on a \$12.5 billion trade package over five years, all in addition to military purchases, and nearly half of it in nuclear programs (the other half was in port facilities and agricultural projects). Iran had agreed to sell the United States 500,000–750,000 barrels of oil per day below the OPEC prices, by tying it to military purchases. Kissinger told President Ford, “I don’t think they realize what they are doing.” Ford was delighted. The Americans and Europeans were pushing oil producers into such extensive development programs that they would not be able to reduce production. “We may have broken OPEC,” Kissinger said to the president, “or will have if we can make one more deal like this.” And even better, Kissinger guessed that the money spent on the oil would be used by Iran to make further purchases. “The money will never leave the United States.”⁴⁰

Despite Kissinger’s enthusiasm, Iran was becoming keenly aware that its nuclear ambitions were not measuring up to their initial promise. Iran did not wish to enter into a permanent state of dependence on the West, yet the additional protocols demanded by nuclear suppliers seemed to suggest that kind of future. In meeting with Ambassador to the United States Ardeshir Zahedi and Iranian finance minister Hushang Ansari, both Ford and Kissinger dodged the proliferation issue and tried to focus on the purchases. Ansari noted that Iran was willing to invest in an enrichment plant, but that the United States would have to provide access to the technology so that it could be gradually transferred to Iran. Ford replied tactfully, “I am not a technician, but the goodwill exists for a constructive solution.” Kissinger added: “There are technical obstacles but we hope they can be worked out.” Before dropping the subject, the president added “The will exists.”⁴¹

The Iranians were not happy, however, with the insistence on separate agreements, and the growing view in the West that some aspects of the nuclear fuel cycle should remain perpetually located in the West. They did not wish to give Americans the right to veto Iranian decisions about what to do with their plutonium. What the United States thought might be a minor stumbling block turned out to be a major point of discord. The lack of agreement turned into a “serious irritant in our relations with Iran,” National Security advisor Brent Scowcroft wrote to the president in 1976, noting that E’temad had even rejected American ideas about a multinational uranium processing center in Iran.⁴²

A similar situation was unfolding in Iran’s relations with Europeans. As the negotiations got more uncomfortable, the projects were underway, putting considerable pressure on Iran to sign the agreements. None of the Western partners

40. Memorandum of Conversation, March 4, 1975, FRUS 1969–1976, vol. 27, 322–23.

41. *Ibid.*, 323–24. Quote p. 326.

42. Memorandum from the President’s Assistant for National Security Affairs (Scowcroft) to President Ford, April 19, 1976, 1969–1976, vol. 27, 520.

wished to press the issue because each was afraid the contracts might evaporate. Even in advance of a contract, the German firm Kraftwerk Union had created what one German embassy official dubbed “the biggest construction site in Iran,” to build two 1300MW power stations near Bushehr. The work started in 1975, and by early 1976 there were hundreds of Germans and thousands of Iranians working at the site. All this happened on the basis of a letter of intent, not a binding contract, which not only made the German nuclear businessmen nervous but also put pressure on the AEOI to finalize the deal. After the first year of construction, Iran continued to balk at the notion of a bilateral contract about the reactors. Some observers suspected that Iran hoped the pressure of the construction timetable—and the desire to get paid—would compel Kraftwerk Union to build the reactors without a specific contract about safeguards. German diplomats assured their fellow suppliers that it was more important to abide by the suppliers’ agreement than to make money selling reactors to Iran.⁴³

Further delaying the process, the Europeans allowed Iran to think that one supplier state might be more reasonable than the others. The British benefited from the Iranians’ attempts to find the most suitable partners, because it opened up considerable dialogue between the two countries on nuclear matters. Iran did not like the Americans’ hardening attitude about proliferation safeguards, and their lack of flexibility drove Iran to look for more accommodating partners elsewhere. But the truth was that the apparent differences in attitude among suppliers were really a matter of tactics. The Germans had allowed the question of a bilateral safeguard agreement to be shelved until reactor construction was underway, so they seemed more cooperative. The French had wisely ignored the question of safeguards in their talks, but prioritized other projects (like the enrichment plant located in France) rather than make any progress on their letter of intent to build two 900MW reactors on the Karun river. Not that they were unenthusiastic: the French had hopes of profiting from the Shah’s construction of power plants, and even thought it would be a good idea to supply Iran, at some point, with a reprocessing facility for the reactors’ spent fuel. When quizzed by other diplomats at their slow pace, the French said there was plenty of time, there was no need to antagonize the Iranians. The longer they waited, the farther along the work went, the more Iran would owe. Whatever happened between Germany and Iran would clear the air and simplify their own negotiations, so why not wait it out and pursue other profitable projects? The British took the French route, pursuing safety contracts and other deals in advance of reactor sales, which they hoped to participate in later.⁴⁴

The Americans evidently were the worst to deal with, having insulted Iran by being the first to admit they could go no further without first agreeing on a safeguard deal. Kissinger’s special relationship with the Shah tottered, because the

43. P. J. Westmacott [British Embassy, Tehran] to M. J. Wilmschurst [Energy Department, FCO], March 24, 1976, UK National Archives, AB 65/1066.

44. *Ibid.*

Americans seemed to be backtracking on what the original agreement had been. The politics of nuclear proliferation had become more demanding since the inception of Kissinger's cartel-breaking strategy. Now the Americans were coming clean about what would really be necessary. It turned out that the Americans were the most forthright of all international partners at that time, but it cost them.⁴⁵ What they lacked in diplomatic deftness the Americans could not make up for in honesty; even though all suppliers ultimately would want such a deal, the Iranian nuclear establishment preferred working with Europeans.

The country that had the easiest time in negotiations was Britain, mainly because the relationship was based on expertise rather than reactors. Why didn't Iran buy reactors from Britain? Compared to the complexity of the nuclear picture in Europe, in Iran it was rather simple. In Britain, the Atomic Energy Establishment had approved several different designs and each had advocates: the kinds of reactors being advocated in the seventies included pressurized-water reactors (PWRs), advanced gas-cooled reactors (AGRs), and steam-generating heavy water reactors (SGHWRs). These last were the primary focus of British experts in the mid-seventies, though that would change in favor of AGRs in coming years. The Iranians found the multiplicity of designs overwhelming and wished that Europeans would focus on designs that not only served their national interests but also were exportable. E'temad pointed out in 1976 that Iran had made a firm policy decision to focus on only one reactor type, the PWR. Iran valued diversification, but in its range of partners and suppliers rather than its types of reactors. The policy of diversification in partnerships is why even after working with German firms on its first reactors, Iran also struck reactor deals with the Americans and French, negotiated service contracts with the British, and invited proposals for related construction such as desalination plants from French, German, American, and Japanese firms. They did not wish to be dependent on any one supplier.⁴⁶

By focusing on service contracts, Harwell could dream big and actually finalize their lucrative deals, because the new proliferation protocols dealt with materials and technology, not expertise. Harwell could do safety training and inspection and charge a small percentage cost of each reactor. So if a couple of reactors cost £100 million, Harwell could expect to take in millions of pounds to pay its staff for their time and expertise.⁴⁷ E'temad expected to have dozens of reactor physicists working in the program by the late seventies, and these people would need to have experience as soon as possible.⁴⁸ Harwell was happy to oblige, and

45. *Ibid.*

46. Note for the Record of a visit to Iran by Dr. Marshall, Mr. Plail, and Mrs. Hutchins, 9th–12th July 1976, UK National Archives, AB 65/1066.

47. R. F. Jackson, note, "Request by SRD for Q & PE Support for Iranian Safety Assessment Agreement – A Proposal by Engineering Division," January 30, 1976, UK National Archives, AB 65/1066.

48. I. H. Gibson, "Discussion with Dr. E'temad of Tehran Nuclear Centre," n.d., UK National Archives, AB 65/1066.

helped the Nuclear Research Centre at Tehran lay out an ambitious program of work with two objectives: to support the widespread development of a network of pressurized water reactors in Iran, and to establish a strong scientific base for Iran's nuclear activities. That meant strengthening research and development in reactor physics, metallurgy, fuel fabrication technology, radiation damage, analytical chemistry, and heat transfer. On fuel fabrication, Harwell scientists felt it was important for the Iranians to train scientists on how to produce reactor grade uranium dioxide.⁴⁹ As one British visitor put it in 1976, "for some years at least the Tehran centre is going to be the Harwell of Iran."⁵⁰

Iran looked to Britain and the United States to help it eliminate dependency in the long term, by training Iranian scientists and engineers in the practical business of reactors. When E'temad first took control of the Tehran Nuclear Research Centre, he described it as a "monument of nonsense." He did not believe that Iranians could do independent scientific research, but he did believe that applied research in the service of the nuclear program should be encouraged.⁵¹ The Iranians already working in Tehran were more than a little insulted, and they resisted changes, and E'temad allowed work on lasers to continue. It was a nice compromise between fundamental and applied research. Although still in its infant stages, lasers were a possible means of uranium enrichment. Although they had little experience, they secured funding for a very expensive VARIAN 511 mass spectrometer. E'temad put several Harwell division heads on contract to act as an advisory panel to plan the Centre's program.⁵²

Just as they were disillusioned with American negotiations, Iranians also found American training programs wanting. Was Iran getting nuclear experts, or just spending money? Several of the students who were sent to MIT for training were never heard from again, having disappeared somewhere inside the United States. E'temad's opinion was that the American system of selecting students was very superficial, based on what amounted to a social interview, so it was possible for low-caliber students to find their way to Massachusetts totally unprepared for advanced training in the use of radioisotopes or reactors. The Iranian nuclear scientist extolled the British method, which employed a very technical interview and weeded out the incapable. It also cut down on those who saw nuclear training as an easy way to obtain a visa and emigrate.⁵³

How long would Iran rely on access to Western expertise before it would either be compelled to go it alone, or choose to do so? The behavior of the United States reinforced Iranian desires for diversification in partnerships. Talking to Harwell's

49. O. S. Plail, Note for the record, "Covering Two Visits to Iran for Discussions on Collaboration between the UKAEA and the Atomic Energy Organisation of Iran," October 10, 1975, UK National Archives, AB 65/1066.

50. R. Panter [Research Reactors Division, Harwell], "Notes on Consultancy Visit to Tehran, 27.2.76-4.3.76," March 10, 1976, UK National Archives, AB 65/1066.

51. Marshall, Note for the Record of a Visit to Iran from 4th-6th February, 1975.

52. "Discussions with Middle East Countries," n.d., and Plail, "Covering Two Visits."

53. Plail, "Covering Two Visits."

director Walter Marshall in the summer of 1976, E'temad confessed his worries about the Americans. The Iranians had planned to buy eight reactors from the United States, but the negotiations had stalled. By then the 1976 presidential campaign was well underway, and E'temad was afraid that a Democrat would be elected who would block reactor sales to Iran. That would give more leverage to the French and Germans, and possibly open up a dialogue with Japanese firms.⁵⁴

Throughout this period, proliferation concerns were treated as a public relations concern rather than a genuine roadblock to cooperation. The Americans, French, and British all represented themselves to Iran as agreeing that both uranium enrichment and reprocessing (plutonium-producing) facilities could be built in Iran, and they even proposed that their firms do it. This came up in conversation about temporary reprocessing contracts, in which Europeans would take Iranian spent fuel and reprocess them in Europe. Once again the Iranians disliked how many conditions the Europeans put on these deals. When Marshall raised the possibility of a reprocessing contract, Iran's concerns came to the surface. The British wanted to have a government-to-government agreement that allowed Britain to return waste products to Iran, to protect plutonium in transit and storage, and some kind of safeguard in case Iran decided to withdraw from the NPT. E'temad made clear that Iran's nuclear program should not be penalized by any new steps taken in the spirit of nonproliferation. Iran did not want to enter a reprocessing contract, for example, in which it had to forswear building a reprocessing facility on Iranian soil at some point. Such a deal would be patently unfair, and precisely the opposite of what the NPT was intended to do, namely ensure access to materials and fuel. Both Marshall and E'temad agreed on this point, and strategized ways to achieve a reprocessing capability without worrying people: perhaps having the British do Iran's reprocessing now, and later having a European firm (perhaps a British one) build a reprocessing plant in Iran at some future date.⁵⁵ Marshall's primary concern was to keep Britain in view as a partner.

Iran's position was that it would cooperate with outsiders, but there was no logical reason to prohibit plants on Iranian soil in the future. In negotiations, Western scientists and diplomats avoided directly disagreeing with this because it got to the heart of the logical fallacy within the NPT, namely its inability to ensure access to classified technologies essential to the nonmilitary nuclear fuel cycle. Uranium enrichment, either with gaseous diffusion or with centrifuges, used processes that continued to be classified as secret. If Iran were to research these techniques on its own, in order to maintain the independence of its nuclear power industry, would it be breaking the terms of the NPT? Iran's position was that the NPT could not be used against it this way—otherwise it would not have

54. Note for the Record of a visit to Iran by Dr. Marshall, Mr. Plail, and Mrs. Hutchins.

55. *Ibid.*

signed it. Were there scientific and technological questions about its own electricity grid that Iranians simply weren't allowed to ask? Would Iranians be forever locked into economic and scientific dependence on Europeans and Americans?

On centrifuge technology, Marshall also avoided directly addressing the issue but, when pressed, he was more frank than most. He told E'temad that there was no way Iranians would be allowed to enter a centrifuge plant and learn the techniques, even if the purpose was to provide fuel for Iran's nonmilitary reactors. Marshall, known to colleagues for his overbearing nature, may have been undiplomatic to point this out, but the brazen remark was the truth. Even a peaceful program had permanent black boxes built into it, and Iran would be forbidden from opening them. The technology, Marshall pointed out, was highly classified. Iranians would be welcome to visit gaseous diffusion plants because it would be impossible to learn anything about the classified part of that process just by being present in the facility. The Iranians could learn everything except the crucial part: the design of the diffusion membranes, which were sealed up and hidden from view. Iran had already struck a deal with the French, though, and had paid huge sums to build the gaseous diffusion plant at Pierrelatte. One of Iran's aims in financing it, E'temad protested, was to learn about how gaseous diffusion worked. Marshall suggested that the French might be pretending to share everything about their gaseous diffusion plant with Iran, but it was highly unlikely that the membrane designs had been revealed. "Faced with this direct comment," a British report noted, "Dr. E'temad simply smiled and said that that indeed was the situation, and it was clear that, whatever he might say in negotiations, he accepted that the French and British were behaving similarly on classified matters."⁵⁶ Iran had bankrolled the French operation, needed the fuel for its nation's planned electricity grid, yet was constructing a scenario in which Westerners would have permanent control.

The Iranian Revolution of 1978–1979 radically altered Iran's relationships with the West, but it also showed Iran that the NPT was not a guarantee of access after all. The deals struck in the second part of the seventies deteriorated but did not disappear. One such deal turned out to be a triumph for the French: the Iran-financed gaseous diffusion plant at Pierrelatte went online without Iranian participation and Iran never got any of its enriched uranium, whereas France got to control the plant's destiny. The French government refused to allow Iran access to it, enacting the exact scenario that Iran hoped the NPT would prevent. Years later, E'temad still fumed about it as a great betrayal of Iran by France.⁵⁷ Also years later, the French agreed to compensate Iran, but in money, not enriched

56. Ibid.

57. For an interview of E'temad, see "Foreign Affairs: Akbar Etemad Explains Iran's Nuclear Ambitions," recorded interview by news program Rundschau, August 28, 2012, <http://worldradio.ch/wrs/programmes/nsfa/foreign-affairs-akbar-etemad-explains-irans-nuclea.shtml?32186> (accessed January 3, 2013).

uranium. For their part, the British did not feel like they gained a great deal. When the revolution was underway, they kept specialists in Tehran to inquire about outstanding debts owed to Harwell. Hoping to get paid, Harwell maintained polite relations with the new regime—though the money never came. Archival documents show that every few years, well into the nineties, someone at Harwell would notice the outstanding debt and make a futile inquiry to Iran, hoping for payment.⁵⁸

CONCLUSION

The politics of nuclear nonproliferation interfered with American and European plans to get Iran to spend its money. American diplomats were well aware that the Shah might aspire to a nationwide nuclear energy network for more than just peaceful uses. “Obvious by-product would be potential to develop nuclear weapons capability and it could be one he would opt for if an area nuclear arms race got underway.”⁵⁹ Still, the Americans chose to overlook these potential problems in favor of a reliable partner while pursuing an economic strategy of tying up Middle Eastern capital, to avoid another oil crisis. As the negotiations dragged on, the political landscape in the West changed somewhat due to the Indian nuclear test, then it changed dramatically in Iran because of the revolution. The capital expenditures Kissinger hoped for would indeed take place, not on nuclear projects but rather a costly war with Iraq that lasted nearly all of the eighties.

In the meantime, when Jimmy Carter became president, the Kissinger-influenced plan lost considerable traction and Iran found itself—to its great distaste—being treated like any country on earth, even though it had signed the NPT. Although today historians and policymakers look back and try to judge whether Iran has kept its commitments under the NPT, which it ratified in 1970, it is more correct to date the nonproliferation story to 1974, when the world panicked at India’s nuclear explosion. Only then did the West begin to reinterpret what Iran had signed and demand further safeguards, some even insisting that a peaceful nuclear program should not include Iranians having their own uranium enrichment capability. That was, quite literally, not the agreement Iran had made. Rather, signing the NPT was like opening a door to nuclear technology. Moreover, Western diplomats tried to use it this way by encouraging Iran to spend its oil money on nuclear technologies, even encouraging the idea that one day an enrichment plant could be built inside Iran.

From 1975 to 1979, Iran worried most that the flow of enriched uranium from nuclear suppliers would dry up, making Iran’s electricity grid entirely dependent upon the whims of Westerners. Iranian nuclear planners were convinced that by signing the NPT, the right of access to nuclear fuel could not be denied them.

58. Documents related to Harwell scientists in Tehran during the revolution, and subsequent requests for payment, are in the UK National Archives, AB 48/1294.

59. Telegram from the Embassy in Iran to the Department of State, June 19, 1975, 1969–1976, vol. 27, 408.

Ultimately, however, that is precisely what happened. After the Iranian Revolution and in light of the regime's hostility to the West, Westerners reneged on their uranium promises. Iran was left having spent enormous sums of money, even after building nuclear facilities and educational infrastructure in Western countries, with no access to fuel. Many years later, E'temad recalled how infuriated he was at the French for their behavior over the Eurodif deal. The whole point of the deal was to provide a nonthreatening forum through which a holding company (Eurodif) could, in concert with others, ensure access to uranium for Iran. But after the Iranian revolution, the French stopped cooperating.⁶⁰ In recent years some commentators have suggested that the 1986 assassination of Georges Besse, who had been president of Eurodif during the 1974 negotiations, was due to Iranian attempts to force the French to resolve the controversy.⁶¹ Whether true or not, France and Iran tried to settle the issue with a 1991 agreement that returned the initial loan, plus interest, but with no uranium.⁶²

Since reviving its nuclear programs, Iran has looked away from its previous partners to acquire reactors, enriched uranium, and expertise. Argentina stepped in to supply it with some enriched uranium in the late eighties, and Russia has been particularly helpful in picking up where Europeans left off—assisting with nuclear training and working to complete Germany's Bushehr reactors. The United States, once the most enthusiastic endorser of nuclear technology in Iran, has devoted itself in the twenty-first century to convincing other countries to avoid supplying Iran.⁶³ Existing suspicions in the United States and elsewhere, that Iran had a clandestine nuclear bomb program, intensified in 2003 when the IAEA revealed that Iran had acquired centrifuge designs by 1989 from a network of informants operated by a Pakistani scientist.⁶⁴ Although Iran has signed many accords since the seventies that limit what it can do, it has maintained that any agreements to limit its capabilities are short term rather than permanent decisions, an attitude that has frustrated the West and IAEA inspectors. Despite short-term diplomatic agreements, Iran's underlying attitude has been remarkably consistent through the years of the Shah and the Islamic Republic—that it has the right to enrich uranium within Iran, and the NPT was never intended to put Iran at a disadvantage. If there were parts of the nonmilitary fuel cycle that it needed, Iranian leaders believed then (and believe now), it had the right to pursue them. In 2006 President Mahmoud Ahmadinejad could announce with jubilation that

60. E'temad's recollections form a major part of David Patrikarakos, "How Iran Went Nuclear," *New Statesman* 138, no. 4954 (2009): 26–33.

61. Dominique Lorentz, *Une Guerre* (Paris, 1997).

62. David Albright and Mark Hibbs, "Spotlight Shifts to Iran," *Bulletin of the Atomic Scientists* (1992), 9–11.

63. For an overview of these developments, see Kibaroglu, "Good for the Shah, Banned for the Mullahs."

64. The story of A. Q. Khan's nuclear technology proliferation network, including not just Iran but also North Korea and Libya, is recounted in Gordon Corera, *Shopping for Bombs: Nuclear Proliferation, Global Insecurity, and the Rise and Fall of the A. Q. Khan Network* (New York, 2006).

Iran finally had the capability to enrich uranium. To those who protested, the Iranian leader said, “Be angry at us and die of this anger.” He added, “we won’t hold talks with anyone about the right of the Iranian nation to enrich uranium.”⁶⁵ By then, it was not Iran that had changed but Western diplomats, having grown wary of a hostile Iran. When in 2006 the United States and others refused to accept that Iran could enrich uranium at home, saying that the NPT disallowed it, they had reversed the way Western diplomats’ interpreted the NPT in the seventies.⁶⁶

Many non-nuclear weapons states that signed the NPT did not perceive it as a control mechanism, but as a guarantee of economic freedom. By signing the NPT, for example, countries like Iran were guaranteed access to nuclear materials. They could embark on ambitious projects—like transforming the electricity grid of a nation—with confidence that they would not have to suffer economically disadvantageous deals or beg any one country to do business. By agreeing to forswear weapons, access to nuclear materials and technology became their right, by international law. While in the West the NPT has been perceived as a crucial tool for policing access to weapons, in countries like Iran the discourse has followed a different path: the treaty has been perceived as a crucial guarantor of rights.⁶⁷ Some authors might suggest that this discourse is simply a device, and a cynical one, by a desperate nation trying to justify its activities. However, historians cannot ignore that the same discourse existed in Iran prior to the Revolution, and that Iran routinely insisted upon this interpretation of the NPT during the era when Europeans and Americans alike were lining up to help Iran build a nuclear future.

65. “Iran Rejects U.N. Request to Halt its Nuclear Activity,” *Los Angeles Times* (April 14, 2006), <http://articles.latimes.com/2006/apr/14/world/fg-iran14> (accessed December 21, 2012).

66. “Elements of a Proposal to Iran, as approved on June 1, 2006 at the meeting in Vienna of China, France, Germany, the Russian Federation, the United Kingdom, the United States of America and the European Union,” document S202/06, http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressdata/en/reports/90569.pdf (accessed January 3, 2013).

67. The point about Iran perceiving the NPT as a guarantor of rights, not a constraint to its actions, is not a new one and is noted in Burr, “The History of Iran’s Nuclear Energy Program.”