

CHAPTER 2
THE COMING OF THE ATOMIC AGE
TO PAKISTAN

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Too little attention has been paid to the part which an early exposure to American goods, skills, and American ways of doing things can play in forming the tastes and desires of newly emerging countries.

President John F. Kennedy, 1963*

On 19 October 1954, Pakistan's prime minister met the president of the United States at the White House in Washington. In Pakistan, this news was carried alongside the report that the Minister for Industries, Khan Abdul Qayyum Khan, had announced the establishment of an Atomic Energy Research Organization. These developments came a few months after Pakistan and the United States had signed an agreement on military cooperation and launched a new program to bring American economic advisors to Pakistan. Each of these initiatives expressed a particular relationship between Pakistan and the United States, a key moment in the coming into play of ways of thinking, the rise of institutions, and preparation of people, all of which have profoundly shaped contemporary Pakistan.

This essay examines the period before and immediately after this critical year in which Pakistan's leaders tied their national future to the United States. It focuses in particular on how elite aspirations and ideas of being modern, especially the role played by the prospect of an imminent 'atomic age', shaped Pakistan's search for U.S.

* Epigraph quote from H. Magdoff, *The Age of Imperialism*, (Monthly Review, 1969), p. 133.

military, economic and technical support to strengthen the new state.

The essay begins by looking briefly at how the possibility of an 'atomic age' as an approaching, desirable global future took shape in the early decades of the twentieth century. It then sketches the way that this vision was expressed in the American elite imagination after World War II, and how, with the coming of the Cold War, it became a central element of U.S. foreign and security policy. The essay goes on to examine how, against this background, those of the emergent elite of newly independent Pakistan sought to end their sense of national insecurity, poverty and backwardness, and secure their position and that of the state, both within their own society and internationally, by developing military allies and capabilities, planning economic development, and establishing a scientific community and a public sensibility that would be appropriate to the atomic age. Their aspirations and decisions exemplify a broader pattern that Iqbal Ahmad identified as characteristic of Third World societies, where people find themselves, 'living on the frontier of two worlds—in the middle of the ford haunted by the past, fevered with dreams of the future.'¹

Pakistan's elite has succeeded, at great cost and with help from the United States, in making its dreams come true. They have created a Pakistan that has nuclear weapons, nuclear power plants, and a nuclear complex that dwarfs all other areas of science and technology. But in this fifty-year-long effort, Pakistan's elite has failed to meet many of the basic political, social, and economic needs of its citizens. The essay concludes by looking at the aftermath of the 1998 nuclear tests and the state's promotion of nuclear nationalism as the basis for a shared sense of identity and achievement. My argument is that the peace movement in Pakistan, if it is to prevail, needs to look beyond a simple opposition to nuclear weapons. It must also offer a vision of an alternative future.

ATOMIC FUTURES AND AMERICAN DREAMS

The idea of an 'atomic age' is as old as atomic science. In 1901 Fredrick Soddy and Ernest Rutherford discovered that radioactivity was part of the process by which atoms changed from one kind to another and involved the release of energy. Soon Soddy was writing in popular magazines that radioactivity was a potentially 'inexhaustible' source of energy, that atomic science meant 'the future would bear . . . little relation to the past,' and offering a vision of an atomic future where it would be possible to 'transform a desert continent, thaw the frozen poles, and make the whole earth one smiling Garden of Eden.'² Soddy, along with other scientists and commentators, also talked of how atomic energy could possibly be used in weapons to wage war, and this soon became the stuff of science fiction in the hands of writers such as H.G. Wells, whose novel, *The World Set Free*, was dedicated to Soddy and described 'atomic bombs', the idea of a 'chain reaction', and the effects of an atomic war.³

The future hurtled closer with the 1939 discovery of atomic fission, the process that underlay radioactivity, and as one historian of the nuclear age has observed, 'journalists and scientists everywhere were caught up in the excitement' and there were countless 'awestruck stories' of what might be possible. Part of this future became all too real when in 1945 United States built the first atomic bombs and used them to destroy the Japanese cities of Hiroshima and Nagasaki. The U.S. soon deployed its new weapons to confront the Soviet Union in a divided Europe, and in 1949 the Soviet Union tested its first atomic bomb. The Korean War broke out in June 1950, and on the first day of that war U.S. leaders privately discussed the use of nuclear weapons; in subsequent months the question was raised repeatedly in the press, with President Truman inciting international uproar by announcing in November that, 'there has always been active consideration of its use.'⁴

The development of nuclear weapons proceeded at a furious pace. Britain became the third nuclear armed state when it conducted its first nuclear test in 1952. That same year, the United States

developed and tested the hydrogen bomb, with a yield many hundreds of times that of the bombs that had destroyed Hiroshima and Nagasaki, and the Soviets tested theirs a year later. By 1953 the United States had over one thousand nuclear weapons, roughly ten times as many as the Soviet Union, and by 1955 both had twice that number.⁵ As ever larger bombs were tested year after year, it became hard to ignore the importance of nuclear weapons and the threat of nuclear war.

In these years the United States also led the way in shaping the ideas and hopes for an atomic-powered utopia. The day after the bombing of Hiroshima, *The New York Times* wrote: 'We face the prospect either of destruction on a scale that dwarfs anything thus far reported or of a golden era of social change which could satisfy the most romantic utopian.'⁶ Three days after Nagasaki was destroyed, the *New York Times* editorialised that atomic technology 'can bring to this earth not death but life, not tyranny and cruelty, but a divine freedom,' and could bring 'dazzling gifts' to the 'millions of China and India, bound for so many ages in sweat and hunger to the wheel of material existence.'⁷ Books soon began to appear about the wondrous prospects made possible by atomic technology; a 1947 book, *Atomic Energy in the Coming Era*, claimed that the future would be 'as different from the present as the present is from ancient Egypt,' and captured some of the practical qualities of the atomic dream:

No baseball game will be called off on account of rain in the Era of Atomic Energy. No airplane will bypass an airport because of fog. No city will experience a winter traffic jam because of heavy snow. Summer resorts will be able to guarantee the weather, and artificial suns will make it as easy to grow corn and potatoes indoors as on the farm. . . . For the first time in the history of the world, man will have at his disposal energy in amounts sufficient to cope with the forces of Mother Nature.⁸

The possibilities seemed both limitless and immediate. *The New York Times* told its readers in 1947 that Africa 'could be transformed

into another Europe,' and the *Woman's Home Companion* explained in 1948 that it would be possible to 'make the dream of the earth as the Promised Land come true in time for many of us already born to see and enjoy it.'⁹ Contemporary surveys suggested these ideas were championed by nuclear scientists, parts of the media, some in government and some industrialists, with support largely limited to affluent and well-educated Americans, while the general public focused more on the threat of nuclear weapons.¹⁰ It was these groups, however, with their shared vision of saving the world through atomic science that quickly came to dominate the debate in the United States.

The idea of the atomic future soon came to play an important role in U.S. foreign policy. America's determination to save the world—from the Soviet Union, from Communism and from poverty and suffering, through the application of its military strength and its technology—had been laid out by President Truman in his inaugural address in January 1949. He declared:

The American people desire, and are determined to work for, a world in which all nations and all peoples are free to govern themselves as they see fit, and to achieve a decent and satisfying life. . . . In the pursuit of these aims, the United States and other like-minded nations find themselves directly opposed by a regime with contrary aims and a totally different concept of life. . . . We will provide military advice and equipment to free nations which will cooperate with us in the maintenance of peace and security . . . [And] we must embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas.¹¹

It was left to Truman's successor, Dwight Eisenhower, to bring the peaceful atom into the Cold War and onto the global stage. In a speech to the U.N. General Assembly in December 1953, President Eisenhower detailed the destructive power America could now wield with its atomic weapons, and announced that America wished all to share in the bounty of the atomic future that had now arrived.¹² He declared:

Today, the United States' stockpile of atomic weapons, which, of course, increases daily, exceeds by many times the explosive equivalent of the total of all bombs and all shells that came from every plane and every gun in every theatre of war in all of the years of World War II. . . . But the dread secret, and the fearful engines of atomic might, are not ours alone. The United States knows that if the fearful trend of atomic military build-up can be reversed, this greatest of destructive forces can be developed into a great boon, for the benefit of all mankind. The United States knows that peaceful power from atomic energy is no dream of the future. That capability, already proved, is here—now—today.¹³

The speech was broadcast around the world and the U.S. government used it as part of an intense international effort in the years that followed to show that, unlike the Soviet Union, it believed in developing and sharing the peaceful uses of atomic energy. The atomic dream was an American dream, and America would ensure every nation could have a share in it.

It must be said, however, that there was little evidence to support Eisenhower's grand claim that the atomic future was 'here—now—today.' In late 1951 the Argonne National Laboratory had generated a token amount of electricity from a small experimental reactor, which had been widely publicized, and had led to suggestions that nuclear power was 'imminent'.¹⁴ In June 1953, the U.S. Atomic Energy Commission, under pressure to speed up the development of nuclear power, had decided that the quickest way to build a full-scale nuclear power plant was to allow Admiral Hyman Rickover to modify the pressurized water reactor that had been under development for use in aircraft carrier propulsion.¹⁵ It only began operation in 1957. The imagined peaceful and prosperous atomic future was still just a vision. Nuclear weapons, the 'fearful engines of atomic might,' were all too real.

SECURING THE STATE

While the atomic age was taking shape, Pakistan, too, was no more than an idea and a hope. The Muslim League, founded in 1906, and

led by Mohammad Ali Jinnah, eventually succeeded in establishing the state of Pakistan.¹⁶ The history and geography of India's Muslims, their encounter with British colonialism, and their relationship with India's struggle for independence, combined with the nature of the Muslim League movement, left important legacies that shaped the early years of Pakistan, and to some degree has continued to have an influence. These included what has been called a 'low level of political culture' in the feudal and tribal leaderships that dominated much of the Muslim majority areas that became Pakistan, the 'poor institutionalisation' of the Muslim League as a mass-based political movement in these areas; the conflict between diverse local and regional identities and the new national identity; and the simple fact that to create a large constituency the League had been 'deliberately vague about the nature of a future Pakistani state.'¹⁷

On this basis the new leadership set about to achieve what it considered as its primary task, to create a nation-state.¹⁸ The leadership's ability to exercise power at the national level was limited, and a sense of direction was in short supply. As one historian has observed:

The chaos that overwhelmed Pakistan independence was a consequence of little planning and virtually no conceptualization . . . neither Jinnah nor any of his immediate circle was moved to lay out on paper the blueprint for the state they intended to create. There is nothing in the archives to even hint that someone was responsible for defining the nature and structure of the state, its purposes and functions, its powers and limitations.¹⁹

A measure of the chaos may be seen in the effort to create a new constitution through a constituent assembly. Established in August 1947, the assembly never managed to gather all of its sixty-nine members—some chose to go to India and were never replaced and others simply did not show up at meetings. It met for only four days the rest of that year, a mere eleven days the subsequent year, and eventually was dissolved in 1954, having met for a total of a hundred and sixteen days.²⁰

There were other problems. The thoughtless and hurried partition of British India into the new states of West and East Pakistan and India created millions of refugees who trekked in opposite directions across the new borders, seeking new identities and the promise of justice and security. Within months, a war erupted over Kashmir. It ended in a stalemate, with India and Pakistan each controlling parts of Kashmir. Crisis followed crisis. Mohammad Ali Jinnah, who had centralized political and bureaucratic power by appointing himself Governor General of Pakistan, died in 1949, leaving behind a leadership vacuum. Then, in 1951, it was revealed that Maj. Gen. Akbar Khan had been working with a group of left-wing officers and a handful of activists of the Pakistan Communist Party since 1949 in an effort to seize power.²¹ The first Prime Minister, Liaquat Ali Khan, was killed in October 1951 as he was about to address a public meeting in Rawalpindi. There were to be three governor generals and six prime ministers before a coup in 1958 led to more than a decade of military government.

As the new national elite in Pakistan struggled to establish itself and to create institutions that it could call its own, it is easy to see why it sought access to resources and support from powerful international allies. In the immediate aftermath of partition, Pakistan sought to develop a strategic relationship with Britain. Morris James, the British Deputy High Commissioner noted that the Pakistanis, 'in those early years were willing to range themselves at the side of Britain, then still a major world power, if in return we would help them to redress the strategic balance between themselves and the Indians. They sought a powerful outside friend and patron.'²² The search for a 'friend and patron' to help counter India can be understood in large measure as a 'continuation of the political struggle before partition' that Pakistan's eventual leaders had waged against the Congress Party, and for whom 'the habit of criticism could not be effaced by the drawing of a new boundary.'²³ It was this sensibility that led them to interpret and respond to disputes over Kashmir, the division of rivers, the distribution of financial and military resources, refugees etc., as proof of Indian hostility.²⁴ This

sensibility has crystallized in the education system and is present in the national curriculum and school textbooks in Pakistan even today.²⁵

Although Britain was not able to play a role as patron, the Cold War eventually offered both Pakistan and the United States an opportunity for such a relationship. Whereas British India had been vital to the British Empire, the United States saw Pakistan as, 'the hastily created by-product of Britain's retreat from empire, a nation plagued by such immense internal and security problems that it offered little promise for future international prominence.'²⁶ As the Cold War set in, however, the U.S. military planners began to see Pakistan as important because of its 'proximity to the Soviet Union; its proximity to the oil fields of the Middle East; its potential role in the defense of both the Indian Ocean area and the Indian subcontinent; its position as the largest Muslim nation in the world; and its army.'²⁷ Despite this, nothing substantial happened. The U.S. did not want to undermine the possibility of a good relationship with India and so left Pakistan on the margins of the Cold War.

Pakistan's representatives for their part tried to incite the U.S. to reach out. They 'carefully couched all appeals to the United States in a virulently anti-Soviet rhetoric that they hoped would strike a chord with the Truman administration's Cold War planners.'²⁸ Success came not because of their entreaties but with the outbreak of the Korean War in 1950. By late 1951 the U.S. had decided to sell military equipment to Pakistan, and in early 1952 Pakistan and the U.S. signed the first of a number of supplementary agreements on security, which Pakistan soon tested by asking for \$200 million in military aid.

Unites States' concerns and interests in Pakistan were summed up in an August 1953 Memorandum to the National Security Council from the Acting Secretary of State. The Memorandum observed:

There was a noticeable increase in the activities of the mullahs (orthodox religious leaders) in Pakistan. There was reason to believe that in face of growing doubts as to whether Pakistan had any real friends, more and

more Pakistanis were turning to the mullahs for guidance. Were this trend to continue the present government of enlightened and Western-oriented leaders might well be threatened, and members of a successive government would probably be far less cooperative with the west than the present incumbents.²⁹

In February 1954, the U.S. announced that it would be giving military aid to Pakistan. This was followed, in May 1954, by Pakistan formally signing the Mutual Defense Assistance Agreement with the United States. A U.S. Military Assistance and Advisory Group was created, and these military advisors moved into the General Headquarters of Pakistan's armed forces.

The consequences for Pakistan of this new relationship with the U.S. were enormous. Since independence, Pakistan's political and military leaders had been spending an extraordinary share of available government resources on the military and it was unsustainable. In both 1948 and 1949, over 70 per cent of government expenditure went to the military. This fraction did not fall to 50 per cent in any year in the first decade of independence, and the military only consumed less than half of government spending for two years in the early 1960s before the 1965 war caused the military share to rise again.³⁰

The new strategic relationship with the U.S. had a strong impact on Pakistan's military. United States' training and techniques flowed in along with military aid: 'The United States connection led to the complete revision of tables of organization [of the Pakistan Army], the addition of several entirely American-equipped divisions . . . and the adoption of American techniques (in gunnery for example).'³¹ Along with this went training for the Pakistani military, with hundreds of Pakistani officers attending U.S. military schools between 1955 and 1958. Some of these officers who trained in the U.S. became very prominent. General Zia-ul-Haq, who became chief of the Army Staff in 1976, and in 1977 staged a coup and ruled until his death in 1988, was an early graduate of the Command and Staff College and trained at Fort Leavenworth (where he took the Associate Command and General Staff Officer Course). General K.M.

Arif, who trained at the U.S. Armour School, at Fort Knox, Kentucky, went on to become Chief of Staff to General Zia in 1977 and in 1984 became vice-chief of army staff.³²

The American support for Pakistan apparently 'made a deep impression on thousands of Pakistani officers.'³³ Eqbal Ahmad suggested that this training left a legacy of officers who 'have come to respect American technology, crave for contemporary weapons systems, and favour alliances which promise hardware.'³⁴ Not surprisingly, the Pakistani military began to turn its attention to the role of nuclear weapons. By the time of the Korean War, the U.S. had started to incorporate nuclear weapons into its military strategy and tactics, from bombs, short- and intermediate-range missiles, to an early nuclear howitzer.³⁵

In 1954, Maj. Gen. M.A. Latif Khan became the first Pakistani Commandant of the Military Command and Staff College, Quetta. In the official history of the College, he recalled that,

On taking over as Commandant I found that the study of the various operations of war under nuclear warfare conditions was carried out in an elementary form and a few enquiries made by me soon revealed the fact that this subject had not received the attention it deserved. The time had come for us to start making a serious study of fighting the next war which would, whether we liked it or not, be fought with nuclear weapons.³⁶

Gen. Latif Khan appointed a senior officer to deal with 'future warfare' and thus began the practice whereby, 'during the study of each operation of war, the same problem was considered under nuclear conditions.'³⁷ These exercises included tactical war games without the use of troops, in which hypothetical scenarios were tested out on actual terrain and the existing military doctrines rehearsed.

The United States played a direct role in this training. In the years that followed, Pakistan's Staff College was visited from time to time by a special U.S. Nuclear Warfare Team. The history of the college notes approvingly that, 'this visit proved most useful and resulted

in modification and revision of the old syllabus to bring it into line with the fresh data given by the team.³⁸ This was to be part of a more enduring program, the history notes there were 'periodic visits by American nuclear experts.'³⁹ General Khan noted that, 'it was generally agreed that this subject required serious study, even if we ourselves were not going to be likely to possess nuclear weapons for many years.'⁴⁰

These military exercises were among the first nuclear practices in Pakistan. It is difficult to fathom these rehearsals for nuclear war, in which Pakistanis planned and imagined the use of a weapon that no Pakistani had actually seen or experienced. The psychological and institutional implications of several generations of young Pakistani military officers playing these fantasy nuclear war games merit further study.

How the Pakistani military thought they would eventually acquire nuclear weapons is not clear. Perhaps they believed that these weapons would come to Pakistan as part of the alliance with the United States. In 1956, the U.S. Joint Chiefs of Staff compiled a list of states which they wanted to serve as bases for intermediate-range ballistic missiles, armed with nuclear weapons. The 'most desirable' states for such deployments were Turkey, Norway, Britain, Japan, Okinawa, and France. States considered merely 'desirable' states were Pakistan, Greece, Iran, Taiwan, Denmark, West Germany, the Philippines, Spain, Italy and Libya.⁴¹ The U.S. went on to base its nuclear weapons in Turkey, Britain, Okinawa, Greece, Taiwan, Denmark (actually in Greenland, which was part of Denmark until 1979), West Germany, the Philippines, and Italy. Other nuclear weapons were stored in Spain.⁴¹

Apparently, for reasons that are not clear, Pakistan, Iran, and Libya were the only states from the original list where no U.S. nuclear weapons were placed. There may have been concern about these countries' stability. As suggested in the 1953 National Security Council memorandum cited earlier suggested, U.S. policy makers feared that the pro-Western government in Pakistan might not last.

What is clear is that after the 1958 coup by General Ayub Khan, which put in place a military government that lasted until 1971, the armed forces apparently did not pursue a focused nuclear weapons program. They seemed to have been content with their strong relationship with the U.S. and access to American military aid and high-tech conventional weapons. The political decision to pursue nuclear weapons had to wait until the end of military rule, and ultimately was taken in early 1972 by Zulfikar Ali Bhutto, a civilian leader. Also curious is that even though Pakistan had completed its development of nuclear weapons by the early 1980s, the military government of General Zia-ul-Haq resisted calls for testing these weapons. Instead, he preferred keeping them under wraps and maintaining ties with the United States, receiving military aid and modern American weapons such as F-16 fighters. Only in 1998 did Prime Minister Nawaz Sharif decide to test nuclear weapons. Pakistan's last military ruler, Gen. Pervez Musharraf, also emphasized the need to maintain a relationship with the U.S. and obtain American military aid and weapons.

PLANNING THE FUTURE

The challenge and pattern of economic development has been of central concern for Pakistan's decision-makers since independence. They recognized the weak economic foundations of the new state carved out of the western and eastern peripheries of British India. Indeed, Pakistan's economic prospects were uncertain even before its independence in 1947.⁴³ In March 1946, at a meeting in Calcutta, Jinnah was asked about the relative backwardness of the country he envisioned: 'What of the economic situation in Pakistan? There is no iron, no coal, no hydro-electric power, no industries.' Jinnah replied, 'I am fully aware of these things. Our people have had no opportunity to develop these things. I have every faith . . . that, given the opportunity, they will achieve all this.'⁴⁴ At other times, Jinnah was less optimistic: 'If the worse comes to the worst, like a sensible man we will cut our coat according to our cloth.'⁴⁵

Pakistan's first efforts at planning its economic development were launched in 1948, when the government set up two official bodies, a Development Board and a Planning Advisory Board.⁴⁶ The former began its task by asking government ministries to 're-examine and update' projects planned for the area that was now Pakistan by the Department of Planning and Development of the Government of British India. The Board dealt with one project at a time and 'made no attempt to prepare a plan or even to relate projects to one another.'⁴⁷ In 1950, however, as part of the agreement to create coordinated six-year development plans for the members of the Colombo Plan for Cooperative Economic Development in South and Southeast Asia, the Board did put together a larger plan. Still, the plan was little more than a set of 'projects which had been selected on an ad hoc basis without reference to available resources and the requirements of the economy.'⁴⁸

In 1951 the Development Board and the Planning Advisory Board were combined to form a new Planning Commission, but this, too, quickly failed to find its feet. This led, in 1952, to the creation of an Economic Appraisal Committee that believed no harm had been done so far by the failure to plan properly but advised that, 'an adequate and efficient planning [o]rganization is essential.'⁴⁹ The government responded in July 1953 by establishing a Planning Board that was to come up with a five-year development plan to begin in April 1954.

The evidence that Pakistan's economic planners and managers were failing was abundant. Economic growth had been poor: from 1949 to 1954 GNP per capita had risen barely 1 per cent, and per capita rural incomes (reflecting the livelihoods of a great majority of the population) had fallen by 3 per cent.⁵⁰ The arbitrary character of the plans suggested a lack of coherent goals in the planning process. Economists were also in short supply, in fact, a history of the discipline notes that, 'at independence, there were hardly any economists in Pakistan.'⁵¹ The first chief economist of the Planning Commission had actually been a chemistry teacher at the Delhi

University before 1947, and, out of his own interest, had obtained an MA in economics.⁵²

The chairman of the Planning Board looked for help outside the country and found it in the United States. In February 1954 the Ford Foundation agreed to fund a program whereby Harvard University's Graduate School of Public Administration would 'recruit and guide a group of experts who would assist Pakistan's Planning Commission.'⁵³ It should be noted here that Pakistan was not alone in turning to American economists for help with planning; India did the same.⁵⁴ The first economic advisors for Pakistan arrived in April 1954 (around the same time as the military advisors); their work was expected to be mostly completed in about eighteen months. The program grew with time, however, and lasted much longer than anticipated. The last adviser left Pakistan in mid-1970.⁵⁵

The planners saw their task as guiding the transformative movement of the economy, society and culture of Pakistan along a technological axis. The opening page of the first five-year plan declared:

Planning in the present stage of our society means the formulation of programs and policies designed to lead it by a consciously directed and accelerated movement from a largely technologically backward and feudalistic stage into the modern era of advanced technology now on the threshold of atomic age.⁵⁶

The idea of a planned 'accelerated movement' from a 'stage' that is 'backward' to one that is 'modern' is premised on a notion that the difference between societies and economies is not one of history, geography, and culture but rather of different points along a single trajectory. Development meant catching up with the United States.

For the planners, speed was of the essence in this endeavour. Their passion to achieve their goal quickly seemed to overwhelm any reasonable sense of how to accomplish the complex and unprecedented task of economic, social and cultural transformation. The planners insisted that,

A country which has a leeway of centuries to make up cannot think of rest periods. . . . Consolidation and development must proceed simultaneously; the very idea of a breathing time to look back, take stock, settle down comfortably, and then think of the next stage is inconsistent with the speed and tempo of the atomic age.⁵⁷

In addition to its role in planning the economy and advising the government, the Harvard Advisory Group (HAG) was also charged with training Pakistani economic planners. To this end, HAG members worked closely with their Pakistani counterparts to set up a graduate training program for Pakistani economists at leading U.S. universities, including Harvard, Yale and Princeton. The result was a group of Pakistani economists who shared the values of the HAG as well as an understanding of planning priorities. These economists became dominant figures in Pakistan's economic decisions making for the next several decades. One of the most prominent among them, Mahbub-ul Haq, served as Chief Economist of the Planning Commission during 1957–1970 and went on to be Minister of Finance, Planning and Commerce from 1982–1988.

The new economists shared with their mentors a clear perception of the state's role in the economy; the need for a 'modernizing elite' to manage it; and the role nuclear energy could play. Indeed, the latter seems to have overwhelmed their economic rationality. The first study on the economic viability of nuclear power in Pakistan was undertaken in 1955 by Maurice Kilbridge, a HAG member, with input from other members. Kilbridge concluded not only that, 'there does not seem to be much of an economic case for the use of large-plant nuclear power in either East or West Pakistan,' but that the pursuit of such a goal was unrealistic for the foreseeable future, noting that, 'probably not more than 10 persons in all Pakistan . . . have any extensive training in nuclear technology, and . . . not many more [have] the basic education necessary to absorb such training.'⁵⁸

The Kilbridge study should have dampened the enthusiasm to develop nuclear power in Pakistan, but it did not. The determination to hasten Pakistan over the threshold into the atomic age remained strong. Even a decade later, in 1966, at meetings of the Planning

Commission, 'those in charge argued vehemently that nuclear energy was the wave of the future, that we could develop many peaceful uses of nuclear energy, and that we would be left behind in the race of modern science and technology unless nuclear research was given adequate funds.'⁵⁹ Forty years later this vision continues to drive the allocation of large funds into nuclear energy projects that provide electricity at much higher costs than other available energy sources, and are located at unsafe sites that add to the risk of catastrophic accidents.⁶⁰ It is ironic that Pakistan's decision-makers remain intent on the nuclear dream when in the United States, the home of that dream, no new nuclear reactor has been built in three decades.

SCIENCE AND THE NATION-STATE

Kilbridge had pointed out in his study that perhaps fewer than a dozen scientists in Pakistan were trained in the nuclear sciences, and few more had the ability to take advantage of this training. This reflected the general state of science in the areas that became Pakistan. Before partition, India had a Directorate of Scientific and Industrial Research modelled on the British structure for integrating research with the needs of industry. All its laboratories, however, were in cities that remained part of India.

After independence, Pakistan had set up its own Directorate of Scientific and Industrial Research, and in April 1953, this body, headed by Salimuzzaman Siddiqui, set up a Council of Scientific and Industrial Research (CSIR). This council then set up a Planning Committee, headed by Nazir Ahmad (who had trained as a physicist in Britain in the 1920s), to determine where and what kinds of government research laboratories should be built to aid in national development. Ahmad's task was soon made easier, at least in part. United State's President Dwight Eisenhower in his December 1953 'Atoms for Peace' speech, declared that, 'experts would be mobilized to apply atomic energy to the needs of agriculture, medicine, and other peaceful activities. A special purpose would be to provide abundant electrical energy in the power-starved areas of the world.'⁶¹

Pakistan's media welcomed the speech and the promise of the wondrous prospects of atomic energy. In the days that followed the speech, *Dawn*, Pakistan's leading English-language daily newspaper (which was read by the national elite) carried many reports on current and future possibilities. These were illustrated with photographs and elaborate graphics obviously produced by U.S. and British atomic establishments. The stories included U.S. proposals for the use of radioactive waste;⁶² British ideas on using nuclear materials in industry;⁶³ the economics of nuclear power;⁶⁴ surveys of how the U.S. Atomic Energy Commission was assisting countries worldwide;⁶⁵ Britain's plans to produce nuclear electricity within a few years;⁶⁶ an introduction to Britain's atomic establishment;⁶⁷ the announcement by the American company RCA that it had invented an 'atomic battery' that converted atomic energy into electricity;⁶⁸ and an introduction to the physical principles underlying atomic energy.⁶⁹

Pakistan, however, could hardly take advantage of these technological prospects. As Vice Chancellor of Peshawar University Raziuddin Siddiqui explained in his Presidential address to the Sixth Pakistan Science Conference in Karachi in January 1954, even though Pakistan's scientific community was in poor shape, it wanted to play its role in building the nation.⁷⁰ Siddiqui claimed that science was being neglected, with scholars 'at the mercy of petty officials and clerks'—this despite the fact that science and education were a 'defense against ignorance and the consequent poverty and disease.' But, Siddiqui argued, science and education were more than that: 'scientific research education and research is the real and only defense of a country in these days, as modern defense is mainly a technical affair requiring skill scientific skill and knowledge of a fairly advanced type.' With the Manhattan Project barely a decade old, and the Cold War arms race raging, not to mention the struggle for independence from colonialism still fresh in people's minds, it is clear Siddiqui was making the case for the role of science in Pakistan's national security. He went on:

It cannot be denied that in this age of power politics not only the security but even the free existence of the eastern countries is at stake, because of their backwardness in scientific and technical knowledge. . . . Hence we must have a vast army of those trained in all the fundamental and important scientific and technical subjects.

The first evidence that Pakistan's government was thinking of taking a scientific interest in the 'Atoms for Peace' program came in late September 1954. The U.S. National Planning Association announced it was to conduct a series of country studies to look at the 'economic problems and policy issues raised by the rapid increase in technological knowledge of atomic energy and its potential contribution to industrial and agricultural development and improved standards of living.'⁷¹ Pakistan was chosen to be one of the countries for study, along with Japan, Korea, Brazil and Israel, because the Planning Association claimed that, 'all these countries [have] 'special institutions' which might make nuclear development interesting.'⁷² Oddly, however, Pakistan had no 'special institution' at that time working on nuclear research. The report becomes understandable if a decision had been made in principle to start work on atomic energy in Pakistan at this time but had not yet been made public.

The announcement that Pakistan was looking toward atomic energy came some weeks later, at the second meeting of the Pakistan Council for Scientific and Industrial Research in Karachi on 19 October 1954. Khan Abdul Qayyum Khan, Pakistan's Minister of Industries announced:

The government is conscious that with the enormous progress the world is making towards the utilization of atomic energy for civil uses, adequate steps have to be taken without delay in Pakistan to work out a phased program of survey, research and ultimate developments in this field.⁷³

Apparently, at least at this stage, atomic science was to fall within the purview of scientific and industrial research, suggesting that starting an atomic science program may have been driven partly by

the desire of the Pakistani scientific community to gain access to what looked like major new sources of funding, overseas training, and so on, in order to gain more advanced ideas about science, technology, and development. In this they were using the same strategy as their peers within the economic planners and the military, completing the triumvirate of the state-modernizing elite.

It was left to Saleemuzzaman Siddiqui, the head of CSIR, to establish a committee that would draw up a 'detailed, phased Atomic Energy Program.' According to Siddiqui, the first task 'was to survey and assess the country's resources in radioactive minerals.' However, any effective program, he pointed out, would require a large nuclear science community and that meant having to send 'young scientists abroad for specialized training.'⁷⁴

The extreme need for scientists of all kinds was clear, but Pakistan's educational system was not equipped to produce them domestically.⁷⁵ In 1953 Pakistan had only six universities—two in East Pakistan and four in West Pakistan—and not until 1961 would four new universities be created. In these six universities and associated colleges, 57,654 students were enrolled in arts and sciences courses and 2138 in engineering.⁷⁶ A total of 680 students graduated in 1953–1954 with a Bachelor of Science degree, and 107 students graduated with a Master of Science degree. In contrast, 2122 Bachelor of Arts degrees were awarded that year, and 241 Master of Arts degrees. Not one PhD was awarded—two had been awarded in science in 1949 and in 1950 by the University of Dacca [Dhaka], and another was awarded in 1954–1955, but no others until 1965.

The first opportunity to take advantage of the Atoms for Peace program came a month or so later. The Raw Materials Sub-Committee of the U.S. Congress Joint Committee on Atomic Energy visited Pakistan as part of a whistle-stop tour that included New Zealand, the Philippines, Formosa, Thailand, India, Iran, Turkey, Greece, Spain, and Australia. The U.S. delegation described their visit to Pakistan in effusive terms:

In Karachi we had the very real pleasure of meeting first with Prime Minister Mohammed Ali, and later with the Council of Scientific and Industrial Research for Pakistan. Long and hard though the road ahead is for the people of Pakistan, they see and are attempting to grasp the opportunities to make their passage along that road faster and better through the use of atomic energy.⁷⁷

Their Pakistani hosts did not lose an obvious opportunity to make a case for the importance of U.S. help in their endeavour to set up atomic energy facilities. The Committee wrote, 'scientists and government administrators alike made it clear to us while we were there conferring with them that they must have assistance and would welcome it particularly from the United States.'⁷⁸ They praised the efforts of Pakistan's would-be nuclear scientists, 'men of scientific and technical stature who are trying . . . with their limited means to bring their country the benefits of this most revolutionary science.'

The major public announcement of Pakistan's nuclear plans came on 1 January 1955, in Prime Minister Mohammad Ali's 'first of the month' broadcast to the nation. After laying out a number of decisions taken by the government on constitutional and economic issues, he declared:

While concentrating our attention on matters of vital interests to your daily life we have not been unmindful of the need for the country's progress and development in other spheres. A step forward in the scientific field was the formulation of a scheme to set up a Nuclear Research Centre for exploring the possibility of obtaining uranium from the mountainous regions of our country with a view to production of atomic energy for the country's economic development.⁷⁹

The visit of the Congressional Joint Committee was viewed as a certificate of approval for Pakistan's plans. The Prime Minister announced that, 'four members of the United States Joint Committee on Atomic Energy visited us. . . . I am happy to state that the U.S. delegation has not only given us encouragement but has expressed their appreciation of our efforts in this direction.'⁸⁰

The public also was soon provided opportunities to glimpse the dawn of the nuclear age. In January 1955 the U.S. ambassador opened a travelling public exhibition on the Atoms for Peace program, created by the U.S. Information Agency.⁸¹ The exhibition, occupying 3000 square feet, used pictures, films and models to show the development and possibilities of nuclear science and technology. The show opened in Bahawalpur and was reported to be a 'smash hit,' with more than 2500 people viewing it within the first two hours of its opening, and as many as 6000 visitors two days later.⁸² Eventually 50,000 people were reported as have seen it.⁸³

After Bahawalpur the exhibition, now jointly sponsored by the Pakistan Atomic Energy Committee and the U.S. Embassy, moved to Karachi, the capital, where it was opened by Finance Minister Chaudhri Mohammad Ali.⁸⁴ It drew an audience of 300,000 people during the two weeks of the exhibition.⁸⁵ It then went on to Lahore and Peshawar, and toured most of the other major cities, drawing large enthusiastic crowds. The atom was now firmly part of the public consciousness of a significant number of urban, middle-class Pakistanis.

On 11 August 1955 Pakistan and the U.S. signed a five-year Agreement for Cooperation on the Civil Uses of Atomic Energy. The U.S. provided funding for a small research reactor, fissile material to fuel it, an archive of technical reports and papers on many aspects of nuclear science and engineering, and a training program for scientists and engineers. By 1961 the newly created Pakistan Atomic Energy Commission (PAEC) had 144 scientists and engineers, who either had already received training abroad or were currently being trained abroad. Among those trained in the U.S. was Munir Ahmed Khan, who would return to Pakistan and in 1972 become Chairman of PAEC, and was given the responsibility of launching Pakistan's nuclear weapons program. The program took on more urgency after India's May 1974 nuclear weapons test, and continued despite U.S. sanctions and pressure in the late 1970s. This pressure was eased after Pakistan joined the U.S. in a proxy war against the Soviet Union when it invaded Afghanistan. The program succeeded in the early

1980s and, following additional nuclear tests by India, Pakistan tested its nuclear weapons in May 1998.

CONCLUSION

This essay argues that the ideas of an atomic future that were developing in the United States became a central element in its relationship with Pakistan as soon as the U.S. began to engage with that country. The relationships between Pakistan's military, economic planning, and scientific institutions and the United States were all informed at some level by the idea of this imminent atomic future. For Pakistan's new national elite, embracing this future offered a way to affirm a shared perspective on what it meant to be a modern state and society in the contemporary world and what the future would be like. The pursuit of this future also privileged those who could operate at the national level and with the United States.

The embrace of an atomic future essentially distinguished those who saw a way for the country to become modern at home and part of the modern world from those who were rooted in the past and locality, clung to tradition, and did not believe in rapid social change. In this respect, the idea and ideal of an atomic future may be read as representing both the future and the universal as opposed to the local and the present. Based on this radical vision of a future world, these new bureaucracies of economy, violence and technology, exposed at a formative stage to American goods, skills, and ways of doing things, imbued with certain American tastes and desires, and all privileging 'technical superiority', set about creating the necessary conditions for the exercise of their power.

For those Pakistani elites able to create and take advantage of them, ties to the United States offered preferential access to power, resources and privilege. Pakistan's army saw in the U.S. a source of money, weapons, training, strategic support, and the future of warfare. Its economic planners saw development as stemming from access to U.S. aid and knowledge and aimed at creating a society modelled after a United States that was entering the nuclear age. For the scientists, a path was opened by President Eisenhower's

Atoms for Peace plan with its vision of a short-cut to a nuclear future, with scientists as the indispensable guides.

These ideas of past, present and future, of change, progress and possibility, and the institutions that claimed to embody them were to have an impact comparable in some respects to the much earlier experience of some nominally independent countries importing European ideas and institutions during the colonial period.⁸⁶ Pakistan was to see the emergence of a military that dominates national politics and the allocation of national resources, one that has seized power three times and ruled directly for over half of Pakistan's history so far. It has had a process of economic planning and management that has failed to provide basic needs to a large proportion of citizens, and remains dependent on international aid to meet its most basic developmental needs. Pakistan has witnessed the creation of a nuclear estate of nuclear power plants, nuclear weapons, and nuclear science and technology research and development. But Pakistan's nuclear estate can offer only a nuclear nationalism, evident in the models of the nuclear weapons test site and ballistic missiles that were put up in major cities, as well as the annual celebration of the anniversary of the May 1998 nuclear tests.

The narratives and displays that initiated the 28 May celebrations in 1999 are revealing. The plans for what the government called a celebration of 'self reliance', and of an 'impregnable defense' included 'a competition of ten best Milli songs, seminars, fairs, festive public gatherings, candle processions, sports competitions, bicycle races, flag hoisting ceremonies etc. People will offer Namaz-e-Shukrana as well. Apart from this special programs for children would be arranged. Debates would be held among school children.'⁸⁷

To make sure that no one missed out on this new common sense about the meaning of Pakistan's nuclear weapons and those who manufactured them, there were to be programs 'broadcast on national network as well as locally by all 24 stations of the radio. In addition to the national language Urdu, programs in regional languages, including Punjabi, Sindhi, Pushto, Balochi, Brahui, Saraiki, Potohari, Hindko, Balti and Shina will also be broadcast.

The external service and world service will air special programs in fifteen foreign languages for listeners in Europe, Middle East, Africa and South East Asia. The Azad Kashmir Radio will also broadcast special programs on the occasion in Kashmiri, Gojri, Pahari and English languages.⁷⁸⁸ This would ensure that everybody could hear and understand the new national story of nuclear Pakistan. The audience was also meant to be global; as Information and Culture Minister Mushahid Hussain proudly put it, the nuclear test site at Chagai 'has become a symbol of Pakistan's identity all over the world.'⁷⁸⁹

Absent from these celebrations was the recognition that the world has long struggled to eliminate these weapons of mass destruction after they had been first created. It was wrongfully asserted that Pakistan's nuclear achievements were a proof of national self-reliance. In fact, the nuclear project from its inception relied on outside support. Pakistan's nuclear scientists were trained abroad, at the expense of others. Its nuclear research and nuclear power reactors were imported, the key technology for producing the fissile material for its nuclear weapons was bought abroad covertly by A.Q. Khan, and even the design of its bomb may have come from China.

Rather than proving national strength and self-reliance, the coming of the bomb exposed Pakistan's fundamental weaknesses. Indeed, the events after the May tests provided clear evidence of just how weak Pakistan actually is. The sanctions imposed by the international community in response to the nuclear tests were quickly lifted not because the world was awed by Pakistan's new nuclear might, but because they saw its fragility. It appeared that the country was about to fall apart and no one wanted to see that happen.

Pakistan's claims to national technological and military prowess through mastery of the bomb, the reactor, and the missile provide a flimsy veil over its many basic failures as a state and society. It is this recognition that shapes the efforts of the small, emerging anti-nuclear movement in Pakistan to embed its prudential and moral critique of nuclear weapons and nuclear power in a broader

challenge to prevailing ideas and practices of national security, development and the politics of knowledge.⁹⁰ To repeat the call made in, *Out of the Nuclear Shadow*:

The tasks that confront the peace movements in India and Pakistan are unprecedented. Not only must they educate their fellow citizens in what it means to live with nuclear weapons in their midst, they must do so without creating such fear that people are immobilised. They must organise to abolish nuclear weapons but cannot concentrate simply on the technology, politics, economics and culture of nuclear weapons because nuclear weapons cannot be abolished from South Asia or globally while leaving everything else unchanged.⁹¹

This means imagining and building a future that goes beyond emulating the states, economies, societies and knowledge systems of the 'developed' societies. It requires new dreams.

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