



**“Nuclear Power Is Not Just Economics.” Atomic Energy and Economic Development in the Karachi Nuclear Power Plant Project (Kanupp), 1955-1965**

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3 **“Nuclear Power Is Not Just Economics”.<sup>1</sup> Atomic Energy and Economic Development in the**  
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5 **Karachi Nuclear Power Plant Project (Kanupp), 1955-1965**  
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10 **On August 1<sup>st</sup>, 2021, the first and oldest Pakistani nuclear power reactor, built at less than 30 km from**  
11 **the city of Karachi, was shut down permanently 50 years after its first criticality,<sup>2</sup> leading to the**  
12 **conclusion an effort conceived by the modernising elite of Pakistan then under military rule.**  
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17 Extensive research on the nuclear proliferation of southern Asia has produced **crucial** studies both on  
18 the Indian<sup>3</sup> and the Pakistani nuclear programmes.<sup>4</sup> The quantitative disproportion between the two  
19 sets of studies is not merely the effect of the greater extent of the Indian nuclear programme, but it is  
20 mainly the result of the substantial inaccessibility of Pakistani archival sources. Indeed, although it is  
21 now possible to access original Indian documents up to the 1970s,<sup>5</sup> Pakistani studies are still based  
22 either on secondary sources and testimonies, frequently anonymous, or on primary sources of diverse  
23 origin.  
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27 Another aspect to consider is that studies on Pakistan maintain that the nuclear programme peaked  
28 with the creation of bombs with which the nation would rival India in terms of deterrence.<sup>6</sup> Both  
29 Chakma’s ‘road to Chagai’ and Feroz Khan’s ‘reluctant phase’ are images which imply how the  
30 period prior to military re-orientation is a sort of necessary premise, albeit one devoid of any historical  
31 cogency.  
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47 <sup>1</sup> ‘Usmani to Salam’, March 28, 1967 (hereafter dates of archival documents will be displayed as dd.mm.yy), M100,  
48 Abdus Salam Papers (hereafter ASP), International Centre for Theoretical Physics, Trieste.

49 <sup>2</sup> **‘Notes to Nucleonics Week generating tables for August 2021’, *Nucleonics Week*, October 14, 2021.**

50 <sup>3</sup> Robert Anderson, *Nucleus and Nation: Scientists, International Networks, and Power in India* (Chicago: The University  
51 of Chicago Press, 2010); George Perkovich, *India’s Nuclear Bomb. The Impact on Global Nuclear Non-proliferation* (Los  
52 Angeles: University of California Press, 2002); Raj Chengappa, *Weapons of Peace. The Secret Story of India’s Quest to be  
53 a Nuclear Power*, (New Delhi: HarperCollins, 2002); Itty Abraham, *The Making of Indian Atomic Bomb: Science, Secrecy  
54 and the Postcolonial State* (New York: ZED Books, 1998).

55 <sup>4</sup> Malcolm Craig, *America, Britain and Pakistan’s Nuclear Weapons Programme, 1974-1980* (Cham: Palgrave, 2017);  
56 Feroz Hassan Khan, *Eating Grass. The Making of the Pakistani Bomb* (Stanford: Stanford University Press, 2012);  
57 Bhumitra Chakma, *Pakistan’s Nuclear Weapons* (London: Routledge, 2007); Id, ‘Road to Chagai: Pakistan’s Nuclear  
58 Programme, Its Sources and Motivations’, *Modern Asian Studies* 36, no. 4 (2002): 871-912.

59 <sup>5</sup> See Yogesh Joshi, ‘Between Principles and Pragmatism: India and the Nuclear Non-Proliferation Regime in the POST-  
60 PNE Era, 1974-1980’, *The International History Review* 40, no. 5 (2018): 1073-93.

<sup>6</sup> For example Šumit Ganguly and Paul Kapur, *India, Pakistan, and the Bomb: Debating Nuclear Stability in South Asia*  
(New York: Columbia University Press, 2010).

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3 The purpose of this paper, which I believe benefits for the first time, also from primary sources  
4 obtained from the Pakistan Atomic Energy Commission (PAEC), as well as from Canadian, British  
5 and World Bank archival documents, is to offer a fresh **perspective in which a purportedly technical**  
6 **matter was instrumental in the process of reorientation of Pakistan's foreign policy against the**  
7 **backdrop of the international economic Cold War.** **In this sense,** the civil atomic programme becomes  
8 one of the main protagonist of the 'Decade of Development and Reforms', as Pakistani official media  
9 called the period of frenzied, unbalanced economic growth under the leadership of Mohammad Ayub  
10 Khan. The programme may, therefore, come to be read not as a predictable premise of the subsequent  
11 nuclear proliferation of Pakistan, but as a significant factor in the broader debate on the economic  
12 development of a poor country – a country marked by strong growth, yet under a military dictatorship,  
13 appreciated abroad for its moderation and stability while steeped in an increasingly uneasy alliance  
14 with the West.<sup>7</sup>

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30 The Kanupp project makes it possible to examine an incipient but still nebulous nuclear order,<sup>8</sup> in  
31 which general political considerations on the equilibrium of the Cold War prevail over the more  
32 technical aspects. In particular, the aid programme that would have allowed the project's realisation,  
33 against the backdrop of an international reassessment of what 'development' meant for an  
34 underdeveloped country, explains why the US remained a relatively marginal player and why a  
35 medium power such as Canada managed to outshine the UK in the technology of natural uranium  
36 reactors, but then struggled to maintain the initiative, which proved counterproductive in terms of the  
37 already problematic relationship between Pakistan and India.

### 51 **Into the Nuclear Age**

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53 A few years after independence, Pakistan was already in trouble. By any standard a very poor country,  
54 it showed a high degree of artificiality as a nation-state: split by competing conception of Islam and  
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59 <sup>7</sup> Cf. Muhammad Reza Kazimi, *A Coincise History of Pakistan* (Karachi: OUP, 2009), 183-224.

60 <sup>8</sup> David Holloway, 'Conclusion: Reflections on the Nuclear Order', *The International History Review* 40, no. 5 (2018): 1210–18.

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3 'Pakistan-ness',<sup>9</sup> bereft of a common legacy of different kind, during the 1950s Pakistan experienced  
4 the collapse of democracy and the inclusion in the Western camp. Indeed, weakness might find an  
5 exogenous solution in Washington – obsessed by the globalisation of containment and frustrated by  
6 India's policy of non-alignment. So, the 1954 mutual defence agreement with the US marked an  
7 important step of superpower politics in South Asia, somewhat a microcosm of the global Cold War<sup>10</sup>.  
8 In the eyes of the bureaucratic-military elite ruling Pakistan, this alliance was a sort of insurance. The  
9 premium consisted in active participation to US containment efforts through the membership of both  
10 SEATO and the Baghdad Pact, as well as the availability of military facilities for American  
11 surveillance activities. In exchange, US patronage would afford to Pakistan security, prestige for its  
12 international quest for equality with India, and a chance to become a viable state through economic  
13 development.

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Against this background, Pakistan almost inadvertently entered the atomic age on the eve of President Eisenhower's famous 'Atoms for Peace' speech in 1953,<sup>11</sup> purchasing a Cockcroft-Walton generator from the Dutch Philips to enhance the experimental endowment of the High Tension Laboratory at Lahore Government College, led by the physicist Rafi Muhammad Chaudhry.<sup>12</sup> This was a significant machine for those who approached the study of high-energy particles, for it enabled the removal of the prime obstacle in electrostatic generators, that is, the difficulty of reaching sufficiently high voltages to obtain artificial transmutations of the elements. However, this technology, which was already a generation old and which testified to Chaudhry's scientific connections with Rutherford's

<sup>9</sup> Cf. Farzana Shaikh, *Making Sense of Pakistan* (New York: Columbia University Press, 2009).

<sup>10</sup> Cf. David Engerman, 'South Asia and the Cold War', in *The Cold War in the Third World*, ed. Robert S. MacMahon, (New York: OUP, 2013), 67-84.

<sup>11</sup> On this subject see Ira Chernus, *Eisenhower's Atoms for Peace* (College Station: Texas A&M University Press, 2002); John Krige, 'Atoms for Peace, Scientific Internationalism, and Scientific Intelligence', *Osiris* 21, no. 1 (2006): 161-81; Mara Drogan, 'The Nuclear Imperative: Atoms for Peace and the Development of U.S. Policy on Exporting Nuclear Power, 1953-1955', *Diplomatic History* 40, no. 5 (2016): 948-74; Stephen Twigg, 'The Atomic Marshall Plan: Atoms for Peace, British diplomacy and civil nuclear power', *Cold War History* 16, no. 2 (2016): 213-30.

<sup>12</sup> 'Pakistan's progress in nuclear physics', *Dawn*, November 9, 1953. On Chaudhry see bio notes reported in Khan, *Eating Grass*, 26-7.

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3 Cavendish Laboratory, was perhaps more useful as a didactic apparatus than as an effective research  
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5 tool.<sup>13</sup>  
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7 The episode is paradigmatic of the continuing importance of former imperial ties – even in the face  
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9 of the resources which the US plentifully put into the Atoms for Peace diplomacy. On the one hand,  
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11 the purchase of the machine was the result of an initiative by the American Atomic Industrial Forum,  
12  
13 an organization of the nuclear technologies industry; similarly, the creation of a committee of experts  
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15 - led by the Chairman of the Tariff Commission, Nazir Ahmad - with the aim of building a nuclear  
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17 research institute in Pakistan was part of the preparations for the Geneva Conference on the peaceful  
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19 uses of atomic energy in August 1955; finally, Pakistan, like many other countries, signed a bilateral  
20  
21 assistance agreement with the US in June 1955.<sup>14</sup> On the other, it should not be forgotten that  
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23 Chaudhry turned to the Nobel Prize winner, John Cockcroft, at that time Director of the Research  
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25 Group of the United Kingdom Atomic Energy Authority, to urge him to advise the Pakistani  
26  
27 authorities to put in place a realistic nuclear programme.<sup>15</sup>  
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31 Chaudhry pointed out two weaknesses that would not escape international observers in the years to  
32  
33 come: the lack of coherence on the technological level and the critical shortage of human resources.  
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35 However, it should also be noted that, at least in its broad outlines, the aspiration for an extensive  
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37 programme with a strong impact on Pakistan's industrial development was a constant point of  
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39 reference. Moreover, from the beginning, the foundations on which this programme was based were  
40  
41 the creation of a research institute with a technological vocation, the search for radioactive minerals  
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43 and the rapid introduction of electronuclear generation, along with the related effort to train  
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45 technicians, both abroad and in the facilities to be built in Pakistan.<sup>16</sup>  
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55 <sup>13</sup> Klaus Wille, *The Physics of Particle Accelerators. An Introduction* (Oxford: OUP, 2000), 1-7.

56 <sup>14</sup> 'Reuters News', 07.01.55; 'Atoms for peace agreement initialled on June 16, 1955', records created or inherited by  
57 the Dominions Office, and of the Commonwealth Relations and Foreign and Commonwealth Offices (hereafter DO)  
58 35/8323, United Kingdom National Archives (hereafter NAUK), Kew Gardens.

59 <sup>15</sup> 'Crook to Walker', 13.01.55; 'note by Cockcroft', 15.02.55; 'Chaudhry to Cockcroft', 31.01.55, DO35/8323, NAUK.

60 <sup>16</sup> 'Ministry of Industries Resolution no. 20, January 5, 1955 establishing the Committee on Atomic Energy', *The Gazette of Pakistan*, January 6, 1955. 'Atomic energy will solve Pakistan's power problem', *Dawn*, June 8, 1955.

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3 Such an aspiration, even leaving aside inexperience and inconsistency, required an enormous amount  
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5 of resources, which Pakistan, of course, did not have. Apart from the United States, a possible source  
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7 of help was the Commonwealth with the Colombo Plan.<sup>17</sup> Nazir Ahmad raised the issue with the  
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9 British already in the spring of 1955, but the UK as a rule did not supply capital equipment and only  
10  
11 offered technical training assistance; indeed, the Treasury was still limiting much of the Colombo aid  
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13 to the running down of existent sterling balances, so imposing constraints on a budget which looked  
14  
15 already overbooked.<sup>18</sup> On the contrary, less financially constrained Canada – like the United States  
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17 and in the framework of an anti-communism that made its policy globally consistent with that of  
18  
19 Washington in the Cold War –<sup>19</sup> had developed an impressive aid machine, which concentrated for  
20  
21 the most part on the Commonwealth's Asian members. In this way, Ottawa aimed to find a special  
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23 role in the phase of competitive coexistence and, at the same time, open up new spaces for  
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25 international projection as a medium power,<sup>20</sup> characterised by a leading position in the peaceful  
26  
27 applications of nuclear energy.<sup>21</sup>

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33 A large share of aid had been earmarked for India. The Canadian initiative to give the country a  
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35 research reactor, in view of its great nuclear aspirations, is the epitome of political ambitions and of  
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39 'Energy Requirements of Pakistan', in *Proceedings of the International Conference on the Peaceful Uses of Atomic*  
40 *Energy, Geneva, 1955* – vol. 1: *The World's Requirement for Energy: The Role of Nuclear Power* (New York: U.N., 1956),  
41 216-38.

42 <sup>17</sup> Born as a collaborative initiative of the British Commonwealth for discussing economic development plans and  
43 facilitating technical and financial assistance in South and South-East Asia, the Colombo Plan served both as a device of  
44 containment for the West and as a vehicle for affirming Asian nations' political will. Without a central fund, financing  
45 was arranged bilaterally or with the World Bank (especially in the case of the international lending consortia for India  
46 and Pakistan), hence the logic of the 'plan' amounted to the sum of each country's development projects. Though the  
47 initial focus was on foodstuff production and technical assistance, by the late 1950s and with the increasing commitment  
48 of the US, the Colombo Plan had turned into a key financing vehicle for big infrastructural projects in the realm of  
49 irrigation, transports, and energy production, thus offering to de-colonized countries a chance to catch up in terms of  
50 economic growth and to subjects like Canada a way to exercise containment through economic development and the  
51 related goodwill in the region. Cf. Daniel Oakman, *Facing Asia. A History of the Colombo Plan* (Canberra: ANU Press,  
52 2010); Shigeru Akita et al., eds., *The Transformation of the International Order of Asia. Decolonization, the Cold War,*  
53 *and the Colombo Plan* (London: Routledge, 2014).

54 <sup>18</sup> 'Crook to Bottomley', 18.04.55, DO35/8223, NAUK. Gerold Krozewsky, *Money and the End of Empire. British*  
55 *International Economic Policy and the Colonies, 1947–58* (Basingstoke: Palgrave, 2001), 65, 172.

56 <sup>19</sup> Jerome Klassen, *Joining Empire. The Political Economy of the New Canadian Foreign Policy* (Toronto: TUP, 2014).

57 <sup>20</sup> Cranford Pratt, ed., *Canadian International Development Assistance Policies: An Appraisal* (Montreal: McGill-Queen's  
58 University Press, 1994); David Morrison, *Aid and Ebb Tide. A History of CIDA and Canadian Development Assistance*  
59 (Waterloo: WLU Press, 2011).

60 <sup>21</sup> Brian Buckley, *Canada's Early Nuclear Policy. Fate, Chance, and Character* (Montreal: McGill-Queen's University Press,  
2000).

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3 the constraints to which these were subject.<sup>22</sup> The offer, in fact, was intended on the one hand to  
4 counterbalance the Soviet loan offered to India to increase its steel capacity and, on the other, to give  
5 international visibility to the Canadian nuclear industry in the year of the Geneva Conference, beating  
6 off the Americans and the British.<sup>23</sup> As Canada's high commissioner in New Delhi, Escott Reid, who  
7 had played an important role in organising the Ottawa aid machinery, noted, pro-Western Indians  
8 would certainly have understood the difference between the Canadian gift and the Soviet loan.<sup>24</sup> The  
9 gratuitousness also meant that, since there was as yet no IAEA or international safeguards regime,  
10 the peaceful use of a first-rate plutonium generator would rely exclusively on the Indian word, despite  
11 US objections to it.<sup>25</sup>

12 Leaving aside technical considerations, the Canadians chose a research reactor so as not to arouse  
13 Pakistani envy, admitting that both countries would need power reactors to meet their electricity  
14 needs.<sup>26</sup> It was, however, a display of insensitivity, which took for granted that Pakistan could at some  
15 point import atomic power plants, while being in no position to have its own nuclear programme.  
16 This was a mistake which contributed decisively to transforming the nuclear aspirations of the country  
17 into a political necessity: non-alignment could offer dividends denied to those who could be  
18 considered trusted allies.

19 [Pakistani foreign minister Hamidul Huq] Choudhuri began by saying that [...] as member of both SEATO and of the  
20 Baghdad Pact, they had hoped that one of the two atomic energy centres being established under those two Pacts would

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<sup>22</sup> Jill Campbell-Miller, 'The Mind of Modernity: Canadian Bilateral Foreign Assistance to India, 1950-60' (Ph.D. diss., University of Waterloo, 2014); Ryan Touhey, *Conflicting Visions. Canada and India in the Cold War World, 1946-76* (Vancouver: UBC Press, 2015); Robert Bothwell, *Nucleus. The History of the Atomic Energy of Canada Limited* (Toronto: UT Press, 1988), 349-358; Iris Lonergan, 'The Negotiations between Canada and India for the Supply of the NRX Research Reactor 1955-56' (Ph.D. diss., Carlton University, 1989).

<sup>23</sup>: 'Memo by Ritchie', 15.03.55; 'memo for the Minister', 21.03.55, RG25 V7342 F11038-1-13-40 (1.1), Library and Archives Canada (hereafter LAC), Ottawa.

<sup>24</sup> 'New Delhi to DEA', tel. 204, 29.03.55, RG25 V4125 F14003-J2-3-40 (1), LAC. On Reid's role see Greg Donaghy, "'Reasonably Well-Organized": A History of Early Aid Administration' in *A Samaritan State Revisited: Historical Perspectives on Canadian Foreign Aid*, eds. Greg Donaghy and David Webster (Calgary: University of Calgary Press, 2019), 53-72.

<sup>25</sup> 'DEA to Canadian Delegation to consultative committee of Colombo Plan Conference', 05.10.55; 'Washington to DEA', tel. 1726, 13.10.55, RG25 V7342 F11038-1-13-40 (1.2), LAC. 'Agreement on the Canada-India Colombo Plan Atomic Reactor Project', 28.04.56, RG25 V7343 F11038-1-13-40 (4.1), LAC.

<sup>26</sup> 'Meeting to discuss atomic energy and Colombo Plan held on March 25, 1955', RG25 V4125 F14003-J2-3-40 (1), LAC.

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3 be placed in Karachi. The fact that this had not been done and that India was establishing a large atomic energy  
4 organization with substantial backing from the West, and in particular was being given an NRX reactor by Canada, made  
5 it imperative for the Pakistan Government to be able to tell its people that some comparable organization would be  
6 established in Pakistan. [Mr. Choudhuri] said it was the present firm intention of the Pakistan Government not to accept  
7 assistance from the Russians because they were sure it would be accompanied by political interference. Nonetheless the  
8 fact that such assistance had been accepted by countries like India and Egypt would make it difficult for them to explain  
9 to their people why they refused it if comparable assistance were not available from the Western powers.<sup>27</sup>  
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18 In February 1956, Pakistan's attempt to validate its position as a trusted but disgruntled ally, in the  
19 light of Bulganin's offers of cooperation, came to nothing.<sup>28</sup> The Canadians, who had been  
20 approached several times since the summer of 1956 with a variety of requests ranging from the  
21 exchange of information to the provision of infrastructures along Indian lines, showed no interest.  
22 Indeed, the coincidence of Pakistani demarches with the negotiations by a group of 12 nations of the  
23 draft Statute of the IAEA was unfortunate. With Article XII the remit of the new international agency  
24 extended into external control on national nuclear programmes to safeguard against the diversion of  
25 fissile material from civilian to nuclear use. Ottawa then engaged in agonising negotiations with India  
26 – a staunch opponent to the safeguards concept – to bring fuel for the Canada-India Reactor (CIR)  
27 under Article XII and simply ignored the Pakistanis request for a draft bilateral agreement made in  
28 early 1957, to the point of being unable by the summer of 1958 to establish whether the draft had  
29 been sent to Karachi.<sup>29</sup>  
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46 However, the more efficient British were unwilling to go beyond research cooperation for practical  
47 reasons - lack of money and the belief that Pakistan was already receiving sufficient aid - and for  
48 political considerations. Officials in Whitehall, like the Americans, were convinced that Canada was  
49 making a mess of CIR and so it was inappropriate to help Pakistan at that time: any concessions would  
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56 <sup>27</sup> 'Note for the record', 06.07.56, DO35/8323, NAUK.

57 <sup>28</sup> Vijay Sen Budhraj, 'The Evolution of Russia's Pakistan Policy', *Australian Journal of Politics & History* 16, no. 3 (1970):  
58 343-60.

59 <sup>29</sup> 'PK High Commissioner to DEA', 24.08.56; 'Grandy to PK High Commissioner', 10.09.56; 'DEA to PK High  
60 Commissioner', 05.08.58, RG25 V7884 F14003-P-2-3-40 (1), LAC. 'New Delhi to DEA', tel. 535, 29.04.57, RG25 V4125  
F14003-J2-3-40 (1), LAC.



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3 then have to be extended to India, which was maintaining a negative attitude in the negotiations to  
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5 create a safeguards system under the IAEA. Thus, while New Delhi succeeded in obtaining a regime  
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7 of self-inspection for the CIR, Pakistan - which both the British and the Canadians recognised as  
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9 having supported the Western line in the IAEA negotiations - was left empty-handed for reasons that  
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11 went beyond an assessment of its own performance.<sup>30</sup>  
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14 The efforts made under the aegis of Nazir Ahmad,<sup>31</sup> therefore, apart from their intrinsic  
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16 inconsistencies and objective limitations, would not have had much chance of success in the wider  
17  
18 international context in which they were placed. On May 14, 1959, Pakistan accepted the Canadian  
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20 draft of a bilateral agreement of cooperation. In it, the question of energy supplies was given  
21  
22 prominence and the possibility of obtaining assistance in the production of nuclear fuel was left open;  
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24 on the other hand, Article 4 did impose Canadian safeguards inspections on Pakistan and a  
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26 commitment to consultations aimed at implementing the IAEA regime, once it was in place.<sup>32</sup>  
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29 In short, there was little in the way of practical action, with the object and conditions of assistance  
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31 still to be defined, but the situation required a much heavier burden of control than that granted to  
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33 India, and certainly not only on the basis of the assessment of the Pakistani case per se.  
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### 40 **The Usmani-Salam duo**

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42 This is the context in which the reorganisation of Pakistan's atomic energy establishment and the  
43  
44 inclusion of Ishrat Hussain Usmani in the Pakistan Atomic Energy Commission (PAEC) matured.  
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46 Foreign observers did not fail to notice that the arrival at PAEC of an official of the calibre of the  
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48 Chief Controller of Imports and Exports meant that Nazir Ahmad's days as chairman were numbered.  
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50 Despite having a scientific background dating back to the 1930's, Usmani's ability as a competent  
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55 <sup>30</sup> 'Michaels to Allen', 09.11.56; 'Thompson to Aston', 15.03.57; 'Belgrave to Allen', 24.05.57; 'James to Michaels',  
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57 06.08.57, DO35/8323, NAUK. 'Memo for the Minister', 27.01.60; 'Washington to DEA', tel. 1119, 28.04.60; 'DEA to  
58  
59 London', ET-639, 05.05.60, RG25 V4125 F14003-J2-3-40 (2), LAC.

<sup>31</sup> Ahmad described the developing institutional framework in Id., 'The Pakistan Atomic Energy Commission', *Pakistan Quarterly* 7, no. 3 (1957): 14-7.

<sup>32</sup> 'Agreement between the Government of Canada and the Government of Pakistan for cooperation in the peaceful uses of atomic energy', 14.05.59, RG25 V4437 F14003-P2-1-40 (1), LAC.

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3 and dynamic administrator was evident. He was convinced of the possibilities of development and  
4  
5 modernisation of his country and of the almost cathartic role that science and technology - and  
6  
7 specifically in the nuclear field - could play in this process.<sup>33</sup> Also in 1959, a brilliant theoretical  
8  
9 physicist, Abdus Salam, who studied under Dirac at Cambridge and went on to win the Nobel Prize  
10  
11 in 1979, joined the PAEC. The chief scientific advisor to the President of Pakistan since 1961, Salam  
12  
13 soon became a leading figure at the PAEC, offering his expertise and growing network of  
14  
15 international contacts. Salam had a very close and lasting relationship with Usmani, as evidenced by  
16  
17 the vast amount of surviving correspondence. Both of them saw the PAEC as the driving force behind  
18  
19 the modernisation of scientific research in Pakistan as part of the rapid and contradictory  
20  
21 transformation process that began after General Ayub Khan's military coup.<sup>34</sup>

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26 The latter tried to shift the focus on socio-economic development and, indeed, Pakistan registered  
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28 astounding trends with an average GDP growth of 16.9% in the period 1960-65. Nevertheless, not all  
29  
30 the population shared in the economic growth: social and regional inequality skyrocketed to the  
31  
32 detriment of the Ayub Khan regime's political legitimacy.<sup>35</sup> In the process, the government laid much  
33  
34 emphasis on education and technical training as determinants for development, while – against this  
35  
36 background – Salam and Usmani pressed for the establishment of a Pakistani techno-scientific  
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38 tradition which would be managed by a single ministry for education and research (following the  
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48 <sup>33</sup> 'Extract from report on economic development in Pakistan during February 1959'; 'Bryan to Reed', 22.06.59,  
49 DO35/8323, NAUK. 'Note by Cockcroft', 16.03.60, DO35/8324, NAUK. 'Memo by the High Commissioner in Karachi to  
50 DEA', 11.04.60, RG25 V7884 F14003-P-2-3-40 (1), LAC. See also S.A. Hasnain, 'Dr. I.H. Usmani and the Early Days of  
51 PAEC', *Nucleus* 42, no. 1-2 (2005): 13-20.

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53 <sup>34</sup> Fayyazuddin Riazuddin, 'Contribution of Prof. Abdus Salam as Member of PAEC', *Nucleus* 42, no. 1-2 (2005): 31-4. On  
54 Salam see Brink, Duff, and Phua, eds., *Memorial Volume on Abdus Salam's 90th Birthday* (Singapore: World Scientific,  
55 2017); Mujahid Kamran, *The inspiring life of Abdus Salam* (Lahore: University of the Punjab Press, 2013); Gordon Fraser,  
56 *Abdus Salam - The First Muslim Nobel Scientist* (Oxford: OUP, 2008); Thomas Kibble, 'Muhammad Abdus Salam, K.B.E.',  
57 *Biographical Memoirs of Fellows of the Royal Society* 44 (1998): 385-402. On Ayub Khan's regime see Hamid Khan,  
58 *Constitutional and Political History of Pakistan* (Karachi: OUP, 2017), 121-60; Shuja Nawaz, *Crossed Swords. Pakistan, Its  
59 Army, and the Wars Within* (Karachi: OUP, 2017): 170-91; Yasmin Saika, 'Ayub Khan and Modern Islam. Transforming  
60 Citizens and the Nation in Pakistan', *South Asia. Journal of South Asian Studies* 37, no. 2 (2014): 292-305; Lawrence  
Ziring, *The Ayub Khan Era: Politics in Pakistan 1958-1969* (New York: Syracuse University Press, 1971).

<sup>35</sup> S. Akbar Zaidi, *Issues in Pakistan's Economy. A Political Economy Perspective* (Karachi: OUP, 2015): 117. Ian Talbot,  
*Pakistan. A Modern History* (London: Hurst, 1998), 169-72.

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3 British and Indian examples) and animated by a scientific civil service.<sup>36</sup> The nuclear programme was  
4  
5 to spearhead this transformation: on the one hand, by affording energy to fuel the economic growth;  
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7 on the other, being the nucleus of a structural change in the domestic balance of power through a  
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9 redefinition of the all-encompassing influence of a civil bureaucracy rooted in the political culture of  
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11 the late colonial period<sup>37</sup>. For Salam and Usmani, nuclear energy was not only a cutting-edge  
12  
13 technology of paramount symbolic value (so an element of post-colonial state building<sup>38</sup>), but also  
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15 the vehicle of a comprehensive process of modernization toward an Islamic, progressive, and  
16  
17 enlightened society.

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19 The situation they faced was daunting. Contacts with the US had so far proved inconclusive, while  
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21 London and Ottawa had received unpromising reports from technicians sent to Pakistan under the  
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23 Colombo Plan. Particularly influential was the report prepared for the Canadian authorities (readily  
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25 available also in London, despite being classified as secret) by Martin W. Johns, Professor of Physics  
26  
27 at McMaster University. Johns painted a bleak picture of the PAEC's recent history, in which the few  
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29 adequately trained staff "vegetated" without a clear research objective and the scientific equipment  
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31 obtained through development aid became obsolete without ever being used. These observations led  
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33 Johns to conclude that assistance should focus on training university graduates with no prospects in  
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35 Pakistan and that capital aid should be limited to the equipment these people needed to carry out  
36  
37 acceptable research. While welcoming the arrival of the Usmani-Salam duo, Johns remained  
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39 convinced - partly on the basis of his own experience as an educator -<sup>39</sup> that it made no sense for  
40  
41 Pakistan to think about creating a nuclear industry.<sup>40</sup>

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54 <sup>36</sup> 'Salam to Faruqi', 29.07.64, M13, ASP. 'Creation of a Ministry of Science and Technology', n.d., M14, ASP. 'An outline  
55 of a national science policy for Pakistan', 30.10.69, M151, ASP.

56 <sup>37</sup> Ilhan Niaz, *The Culture of Power and Governance of Pakistan 1947-2008* (Karachi: OUP, 2010), 102-8.

57 <sup>38</sup> Cf. Stuart Leslie, 'Atomic Structures: The Architecture of Nuclear Nationalism in India and Pakistan,' *History and  
58 Technology* 31, no. 3 (2015): 220-42; Itty Abraham, ed., *South Asian Cultures of the Bomb* (Bloomington: Indiana  
59 University Press, 2009).

60 <sup>39</sup> Don Sprung, 'Tribute to Martin Johns', *McMaster University - Department of Physics and Astronomy Newsletter*  
(Winter 2008): 4, 6.

<sup>40</sup> 'The Atomic Energy Commission of Pakistan and Canadian Aid', n.d., DO182/48, NAUK.

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3 On the one hand, the new PAEC leadership was very quick to consolidate its position internally and,  
4 on the other, at gaining a reputation for moderation and concreteness, all in the interests of an atomic  
5 programme that would serve the economic and technological development of the country. It was  
6 important to marginalise the adversaries within the PAEC and the appointment of Usmani as  
7 President of a Power Commission responsible for examining the needs, costs and sources of electric  
8 generation in the medium-long term was crucial. This would not have been possible without powerful  
9 allies, such as Bhutto, but also like President Ayub Khan himself, who in his speech for the  
10 inauguration of the Lahore nuclear research centre on October 21, 1961 set out a series of themes that  
11 were Salam's, which included the need to modernise by seizing all the possible advantages of a  
12 latecomer, the coherence between scientific research and the teachings of the Quran, the historical  
13 tradition of science in the Muslim world.<sup>41</sup>

14  
15 In terms of external projection, efforts were made to 'internationalise' the argument in favour of the  
16 immediate introduction of nuclear reactors in the country, first with a study by the American Gibbs  
17 & Hill and Internuclear in September 1961, which predicted the economic competitiveness of two  
18 light-water units of 50MW in East Pakistan, one of 100MW in the Karachi region and one of 150MW  
19 in West Pakistan, calculating an interest rate of 4%, amortisation over 25 years and a load factor<sup>42</sup> of  
20 70-80%; secondly, with a more authoritative report by the IAEA, which had begun developing  
21 nuclear power costing methods for developing countries in 1960.<sup>43</sup> This contribution offered no new  
22 data, but supported the PAEC's argument: since conventional sources were not estimated to be  
23 sufficient to guarantee the level of per capita electricity consumption typical of a developed country

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<sup>41</sup> 'Allison to Lucas', 23.10.61, DO182/48, NAUK. 'Note of a visit to Pakistan by Gray on January 28 – February 2, 1961' RG25 V7884 F14003-P-2-3-40 (1), LAC. 'Greenwood to Hodson', 12.08.63, RG25 V7884 F14003-P-2-3-40 (2), LAC. For Salam's ideas see *Pakistan and Technical Development*, address delivered at the University of California March 1964 and *Islam and Science, Concordance or Conflict*, address delivered at a Meeting of the Organization "Islam and the West", UNESCO House, Paris, 27 April 1984 both available at <http://salam.ictp.it/salam/bibliography/speeches>.

<sup>42</sup> The ratio of total output in a period to the designed capacity. This means that these generating units made sense if they could work almost always at high regime – a condition which required both a reasonably fault-free operation of the plants and a modern, interconnected electricity grid.

<sup>43</sup> 'World Digest – Pakistan', *Nuclear Engineering* 6, no. 61 (1961): 227; 'IAEA working on nuclear power costing', *Nucleonics* 18, no 5 (1960): 28; 'Nuclear power in Pakistan', *Nuclear Engineering* 7, no. 71 (1962): 141-142. On IAEA activities and its relationship with Pakistan see Malfrid Braut-Hegghammer, 'Pakistan, Uranium and the International Atomic Energy Agency, 1970–1980', *The International History Review* 40, no. 5(2017): 1034-48.

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3 in the long term (which Pakistan was expected to become), the indirect benefits of investing  
4 immediately in a first atomic power station - for which the most suitable region was Karachi - would  
5 be crucial in terms of technical training and direct experience so that in due course it would be possible  
6 to decide how many resources to invest in nuclear power. Moreover, the possibility that Pakistan  
7 might have uranium deposits made it useful to also develop the basic know-how for a future fuel  
8 element industry.<sup>44</sup>

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17 Another new element was the public dimension of the debate. Key components of the Pakistani  
18 administration and government - such as the Ministry of Finance or the Water and Power  
19 Development Authority - were anything but supportive of the PAEC's line and demanded that  
20 nuclear-generated electricity should not cost more than conventional electricity. On the other hand,  
21 the international specialised press underlined that there was little point in talking about comparative  
22 costs when the calculations were based on very low interest rates, typical of development aid and not  
23 of industrial investments, prompting Usmani's sarcastic reply that even European countries had found  
24 'Santa Claus' in the US after the war.<sup>45</sup>

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Common sense and practicality became the leitmotifs. In March 1962, Usmani and Salam formally  
asked the UKAEA to act as consultants in preparing such a programme. Usmani stated that the  
presence of uranium at Dera Ismail Khan suggested the use of natural uranium reactors, that is, the  
type developed by the British and Canadians, and the prospect of developing the entire fuel cycle  
independently. The construction of a first reactor in the Karachi region (thus wresting East Pakistan's  
priority from it) would allow a cautious start with the more 'proven' British technology. Roger  
Makins, the Chairman of the UKAEA, also privately recognised the wisdom of Usmani's sensible  
and constructive approach and hastened to initiate the design study for a Magnox-type plant<sup>46</sup> to be

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<sup>44</sup> 'Catchpole to Board of Trade', 19.05.61; 'Sharp to Board of Trade', 04.05.62, DO182/48, NAUK. *Prospects of Nuclear Power in Pakistan*, technical reports series no. 7 (Vienna: IAEA, 1962).

<sup>45</sup> 'Note by Jukes', 18.06.62, records of the United Kingdom Atomic Energy Authority (hereafter AB) 48/160, NAUK. 'West Wing WAPDA cold for setting up N Power Station', *Dawn*, May 1, 1962. Usmani, 'Reply to Gracchus', *Nuclear Power 7*, no. 73 (1962): 33.

<sup>46</sup> By extension, Magnox was the generic name of gas-cooled graphite moderated reactors used in the UK first nuclear power programme. This type, like the Canadian heavy water-moderated design, used natural uranium as fuel; instead,

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3 built some 15 kilometres from Karachi, while also extending the technical assistance already provided  
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5 to the PAEC.<sup>47</sup>  
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8 At the same time, in the spring of 1962, Usmani used the same arguments with Lorne Gray, President  
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10 of Atomic Energy of Canada Ltd (AECL.) Faced with Canadian requests for an official application  
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12 from the Pakistani government, he insisted that the preliminary feasibility study be carried out with  
13  
14 the involvement of the PAEC only. This was certainly irregular and it showed that the choice to invest  
15  
16 in nuclear power was still internally problematic. It may therefore come as a surprise that the  
17  
18 Canadians agreed to Usmani's requests, thus strengthening his position in the struggles within the  
19  
20 Pakistani administration. The reasons were primarily political. There were tensions between the two  
21  
22 countries, with Pakistan accusing Canada of de facto assisting India in the construction of nuclear  
23  
24 weapons through the CIR. After the bilateral Indo-Soviet cooperation agreement of October 1961 -  
25  
26 in reality, rather generic but without safeguards - the Canadian High Commissioner in Karachi warned  
27  
28 of the risk that, if Pakistan's requests for aid were denied, it would turn to the Soviets for help.<sup>48</sup>  
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33 In the summer of 1962, Pakistan - or rather Usmani and Salam - was therefore simultaneously  
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35 engaged in two negotiations for the construction of the Karachi power plant. The interest in the natural  
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37 uranium type was genuine and, from the outset, thought was also given to a small fuel manufacturing  
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39 plant; however, it soon became clear that the choice between the British and Canadians was a question  
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41 of money. Moreover, while in some ways the Magnox could be considered more 'proven' thanks to  
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43 the UK's electronuclear programme and the export of two power plants to Italy and Japan, the system  
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50 the US light water reactors burnt slightly enriched uranium. Natural uranium reactors are plutonium breeders, so they  
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52 pose a more serious risk in proliferation terms: such risk did materialize in the case of both India and Pakistan.  
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54 Conversely, this reactor technology apparently offered an economic advantage in the fuel cycle – especially for a country  
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56 with domestic uranium reserves – so producing electricity at competitive cost in big generating units. Moreover, natural  
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58 uranium spared to the user the political and technological dependency from US enrichment services – a sensitive point  
59  
60 for any former colony.

<sup>47</sup> 'Visit to UKAEA of Dr. Usmani on March 8, 1962'; 'note for the file', 27.03.62; 'note by Makins on visits to Pakistan, India, Japan and Washington', n.d., DO182/48, NAUK. 'Extract from minutes of AEX(62)7<sup>th</sup> meeting on April 13, 1962', AB48/37, NAUK. 'Cox to Jardine', 06.09.62, AB48/160, NAUK. 'Cartwright to Webb', 16.05.62, AB65/97, NAUK.

<sup>48</sup> 'Note of a meeting with Eberts on April 17, 1962'; 'note of a meeting with Dr. Usmani', n.d.; 'Usmani to Gray', 13.05.62; 'Gray to Usmani', 06.06.62; 'Eberts to DEA', 22.06.62, RG25 V7884 F14003-P-2-3-40 (1), LAC. 'Agreement between the USSR and the Republic of India for scientific and technical cooperation in the field of peaceful utilization of atomic energy', 06.10.61, RG19 V4487 I39 1, LAC. 'Soviet bid to India shuns competition', *Nucleonics* 18, no 4 (1960): 26.

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3 did not seem to present significant technological scope for development, whereas there was a growing  
4  
5 body of literature on the Canadian Deuterium Uranium (CANDU) system. For years, the ‘father’ of  
6  
7 the industry, Wilfrid Lewis, had been incessantly arguing the merits of the system, using arguments  
8  
9 in tune with those of the Pakistanis. These included the axiom of exponential development of  
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11 electricity demand, to be brought forward rather than chased after; the system’s economic  
12  
13 competitiveness with fossil-fuel plants, thanks to a neutron economy carefully designed to minimise  
14  
15 fuel costs and thus amortise the higher capital costs; the strong likelihood of further economies of  
16  
17 scale thanks to the development of a technology that was still young. In addition, the Canadian system  
18  
19 provided the political and economic advantage of not having to depend on enrichment services and,  
20  
21 also, the predicted costs purposely did not include the valorisation of the plutonium generated in the  
22  
23 reactor, unlike British practice, making it possible - in principle - to choose freely between long-term  
24  
25 storage and spent fuel reprocessing.<sup>49</sup>

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30 The Pakistanis did not pit the British and the Canadians against each other for better terms. In contacts  
31  
32 with the UKAEA, in which Salam acted as a go-between or direct representative for the PAEC, it  
33  
34 was made clear that the central issue was the financial one, but the British, until the end of 1962,  
35  
36 remained convinced that, if anything, the competitors might be the French. Encouraged by the  
37  
38 Pakistanis to believe that they were close to getting the contract to induce them to make concessions,  
39  
40 they did not consider the Canadian possibility and apparently remained in the dark about the other  
41  
42 negotiating party until late autumn. However, when preliminary studies by the UKAEA began to  
43  
44 become available from September 1962 - studies which, again, envisaged the presence of a fuel  
45  
46 fabrication plant - they predicted far too high a cost for the electricity produced.<sup>50</sup>

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49 G.F. Hoveke and J. DeFelice, ‘D<sub>2</sub>O-natural uranium reactor’, *Nuclonics* 17, no. 8 (1959): 63; Wilfrid B. Lewis, ‘Competitive nuclear power for Canada’, *Nucleonics* 18, no. 10 (1960): 54-9; Ruth Fawcett, *Nuclear Pursuits. The Scientific Biography of Wilfrid Bennett Lewis* (Montreal: McGill-Queen’s University Press, 1994), 84-97.

50 ‘Notes for the record, July 2 and 12, 1962’; ‘visit of Dr. Usmani to Risley on September 30 – October 1, 1962, AB48/37, NAUK. ‘Cox to Jardine’, 06.09.62; ‘note of a meeting held on October 2, 1962’; ‘Makins to Garner’, 15.10.62, AB48/160, NAUK.

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3 At the end of October 1962, the Pakistani authorities approved the construction of two power plants  
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5 by the end of the decade, one in Karachi and a smaller BWR-type reactor in East Pakistan. The  
6  
7 compromise was that the higher capital costs for the Karachi plant would be the toll to join the 'atomic  
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9 club,' but the unit cost of the electricity produced had to be competitive with that of the still isolated  
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11 Karachi grid, that is, around 7 mills (a thousandth of a US dollar) per KWh of the gas plants. British  
12  
13 costs stood at 9.5 mills, because the Treasury was not prepared to create an adequate financial package  
14  
15 to offset what was probably a realistic estimate. So the PAEC began to focus on the Canadians and  
16  
17 their aid policy. On October 31, Usmani communicated these decisions to the AECL (he informed  
18  
19 the British only in mid-December), asking if it would be possible to adapt the 80MW NPD prototype  
20  
21 reactor to Karachi conditions, that is, to bring it up to the power (132MW) and the cost per unit of the  
22  
23 gas plant. The AECL was optimistic about the technical feasibility of the project and there were two  
24  
25 factors that played in its favour. First, the willingness of Canadian foreign affairs officials, motivated  
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27 by the need to avoid new accusations of discrimination in favour of India; secondly, the economic  
28  
29 interest of Canadian General Electric (CGE), appointed in January 1963 as consultants to the PAEC,  
30  
31 which promised to produce electricity at just over 6MW. The CGE had been a partner of the AECL  
32  
33 and Ontario Hydro in the construction of the NPD, and the contract with Pakistan would have  
34  
35 guaranteed a workload that would have allowed the Civilian Atomic Power Division to survive as an  
36  
37 independent operator despite the restricted domestic market.<sup>51</sup>  
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44 The Canadians thus became partners for Pakistan's first atomic power plant, something the British  
45  
46 heard about in the newspapers. In a clarifying meeting, Usmani blamed the failure of the negotiations  
47  
48 on the Treasury's unwillingness to provide adequate financing vehicles for an Anglo-Pakistani  
49  
50 transaction. In a belated attempt to keep the British in the picture, however, he asked about the size  
51  
52 of Magnox station required to bring the unit generation cost at 7.5 mills. This was probably intended  
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54 to exert pressure on the Canadians by pitch them against the British, but the UKAEA dismissingly  
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59 <sup>51</sup> 'McAdam Clark to Michaels', 14.05.63, AB48/37, NAUK. 'Makins to Garner', 18.12.62, AB48/160, NAUK. 'Usmani to  
60 Haywood', 31.10.62; 'Haywood to Usmani', 12.11.62; 'memo by Watson', 22.11.62; 'Gray to Moran', 08.07.63, RG25  
V7884 F14003-P-2-3-40 (2), LAC. Bothwell, *Nucleus*, cit., 382-383; Bratt, *CANDU Exports*, cit., 12-4, 104-5.



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3 answered that the reactor should have been so big that the Karachi grid had no chance to accommodate  
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5 it before the late 1970s.<sup>52</sup> It remained to be seen whether the Canadians would be forthcoming on  
6  
7 their own.  
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### 12 **Money and safeguards**

14 From the outset, the AECL had pointed out to all parties involved the uncertainties surrounding the  
15  
16 financing of the Kanupp project. In the summer of 1963, these uncertainties came to the fore because,  
17  
18 the preliminary stages being completed, it would not have made sense for CGE to pay hundreds of  
19  
20 thousands of dollars for the design studies without reasonable assurance that the project would be  
21  
22 funded by the government - as Pakistan was certainly not in a position to pay for it. Officials at the  
23  
24 Department of Foreign Affairs (DEA) and the Department of Trade and Commerce - on which the  
25  
26 AECL depended - were convinced that this payment had to be made. The Pakistani press was  
27  
28 reporting on Soviet offers of nuclear assistance<sup>53</sup> and the construction of an atomic power plant in  
29  
30 Rajasthan was being negotiated with India; in addition, support for Pakistan could not be withheld at  
31  
32 the same time. Kanupp was also the first project in which by far the most important private industry,  
33  
34 CGE, had taken the lead.<sup>54</sup>  
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39 However, although Usmani assured the Canadians that the Pakistan Planning Commission had  
40  
41 approved the project in principle forwarding them a copy of the form with which the PAEC asked for  
42  
43 its authorisation, and although the Pakistani High Commissioner in Ottawa emphasised that his  
44  
45 government attached great importance to the project, the Canadians were reluctant to begin  
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47 negotiations before receiving an official request from Pakistan, fearing it was a ploy by Usmani to  
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53 <sup>52</sup> 'Note of a meeting with Dr. Usmani on December 13, 1962'; 'Mustafa to Orford', 03.05.63, AB48/160, NAUK.  
54 'Cartwright to Usmani', 20.03.63, AB65/98, NAUK.

55 <sup>53</sup> Most probably an intended press leak to exert pressure on the Americans - rather than the Canadians - while Bechtel  
56 Corp. was producing a feasibility report on the construction of a nuclear power station at Roopur, in East Pakistan.  
57 Indeed, after the US cut its aid for Roopur, the Soviets were actively though unsuccessfully involved in the project. 'Troke  
58 to Macklean', 02.04.63, AB65/98, NAUK. 'Memorandum on the Roopur Nuclear Power Plant,' 10.03.69, M147, ASP.

59 <sup>54</sup> 'Olsen to Usmani', 03.06.63; 'Harvey to Bryce', 14.08.63, RG25 V7884 F14003-P-2-3-40 (2), LAC. 'Karachi to DEA',  
60 letter no. 500, 28.06.63, RG25 V4437 F14003-P2-1-40 (1), LAC. 'Ritchie to Bryce', 18.07.63, RG19 V3869 F8342-P152-5-  
5-1 (1), LAC. 'Nuclear Canada at a Glance', *Nucleonics* 18, no. 10 (1960): 52-3.

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3 force his government's hand. The Director General of the Canadian External Aid Office, Herb Moran,  
4 warned the Under Secretary for Foreign Affairs that this had been Usmani's regular practice since his  
5 arrival at the PAEC.<sup>55</sup>  
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10 His fears were eventually confirmed. Faced with a still provisional estimate of \$42 million in  
11 currency, Usmani demanded not only that it be fully covered by Ottawa through a specific mix of  
12 direct aid and soft loans to guarantee an overall interest rate of 4% - a requirement considered essential  
13 to ensure the competitiveness of nuclear electricity - but also that Canada increase the total amount  
14 of development aid allocated to Pakistan. This was because his country's economic authorities, in  
15 particular Finance Minister Mohammad Shoaib and Planning Commission Vice-President Said  
16 Hasan, feared that Kanupp would deprive other projects of resources or put too heavy a burden on  
17 public accounts.<sup>56</sup>  
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20 Hypotheses on the table suggested an increase of the \$19 million/year Canadian aid to Pakistan under  
21 the Colombo Plan in the range of 2.5-3 million/year. In mid-September, Shoaib reiterated to Moran  
22 the request for an increase, revealing a somewhat ominous situation:  
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37 Finance Minister Shoaib [...] asked whether Canada was as anxious as Dr.Usmani to have Pakistan acquire a nuclear  
38 power station at this time under Canadian aid arrangement. [...] Shoaib said it had been within the previous forty-eight  
39 hours that he had for the first time been fully briefed by Usmani on the plan to construct a power reactor [...]. No  
40 recommendation had so far come forward from the Planning Commission to either the National Economic Committee of  
41 the Cabinet – of which Shoaib is chairman – or to the Cabinet as a whole.<sup>57</sup>  
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49 The chaotic panorama that emerges from the Minister's words should not come as too much of a  
50 surprise and reflects the intricacies of development politics, or the interaction of domestic and  
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58 <sup>55</sup> 'PAEC form on Kanupp', 06.05.63; 'Karachi to DEA', tel. 466, 18.07.63, RG25 V4437 F14003-P2-1-40 (1), LAC. 'Moran  
59 to Ritchie', 22.07.63, RG25 V7884 F14003-P-2-3-40 (2), LAC.

60 <sup>56</sup> 'Usmani to Gray', 16.07.63; 'Aitken to Stone', 14.08.63, RG25 V7884 F14003-P-2-3-40 (2), LAC. 'Aitken to Moran',  
15.08.63; 'memo by Aitken', 13.08.63, RG19 V5159 F8342 P152 5 1 1, LAC.

<sup>57</sup> 'Memo by Moran', 20.09.63, RG25 V7884 F14003-P-2-3-40 (2), LAC.

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3 international contests for promoting one's specific vision of modernization.<sup>58</sup> Planning in Pakistan,  
4 introduced with the participation in the Colombo Plan, had come up against serious limitations that  
5 the re-launch set up after the promulgation of martial law had failed to overcome. Similarly, it is  
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9  
10 hardly surprising that the Minister's position was mirrored by that of the Canadian Department of  
11  
12 Finance, which considered India and Pakistan to be countries of questionable financial solvency. Of  
13  
14 the two, the latter had less industrial capacity and, therefore, acquiring nuclear power plants would  
15  
16 proportionally have weighed more heavily on its balance of payments. Furthermore, Pakistan's gas  
17  
18 reserves made it even less logical for the country to invest in nuclear power. In practice, therefore,  
19  
20 the recommendations of the 1960 Johns Report should still be followed and the project abandoned,  
21  
22 instead of encouraging the Pakistanis as the AECL was accused of doing.<sup>59</sup>  
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26 These frictions, in fact, reflected criticisms that had already been expressed for some time by the  
27  
28 World Bank. The negative financial assessment of the Garigliano nuclear power plant in Italy, two-  
29  
30 thirds of whose costs had been covered by the World Bank,<sup>60</sup> led its officials to conclude that  
31  
32 developing countries should not toy with an immature technology that lent itself to financial  
33  
34 manipulation and for which they had limited human resources. India's nuclear ambitions, for  
35  
36 example, had begun to attract similar criticism in this respect as early as the first half of 1961. Canada  
37  
38 had reacted by insisting that the authorities in New Delhi gave the project high priority in the five-  
39  
40 year plan, in order that the international consortium of lenders, set up in 1958 under the aegis of the  
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42 World Bank, should not raise objections.<sup>61</sup>  
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53 <sup>58</sup> Cf. David Engerman, 'Development Politics and the Cold War,' *Diplomatic History* 41, no. 1 (2017): 1–19.

54 <sup>59</sup> 'Memo by Hockin', 12.08.63, RG19 V5159 F8342 P152 5 1 1, LAC. 'Gray to Usmani', 22.07.63, RG25 V7884 F14003-P-  
55 2-3-40 (2), LAC. 'Atomic energy advisory panel meeting held on July 25, 1963', RG25 V7882 F14003 J2 3 40 (7), LAC.  
56 'Hand-written note by Read', n.d., RG19 V3869 F8342 P152 5 5 1 (1), LAC.

57 <sup>60</sup> George Young, 'Italy's Nuclear Power Plant', *International Bank Notes* 16, no. 4 (1962): 3-5. On the Garigliano project  
58 see Valentina della Gala, 'The Nuclear Power Plant in Garigliano. A History of a State Business (1957-1964)' (Ph.D. diss.  
59 University College of London, 2010); Barbara Curli, 'Energia nucleare per il Mezzogiorno', *Studi storici* 37, no 1 (1996):  
317-51.

60 <sup>61</sup> 'Memo by Parkinson', 09.05.61; 'memo by Reid', 27.03.62, RG19 V5289 F7979 I39 7 (1), LAC. 'Plumpré to Gray',  
27.03.62, RG20 V599 F3 51 1 (1), LAC.

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3 Escott Reid, who as High Commissioner in New Delhi had strongly supported the CIR project, as a  
4  
5 World Bank official severely criticised the Indian nuclear projects and the support given to them by  
6  
7 Canada, because he considered them a waste of resources for prestige purposes.<sup>62</sup> Such criticisms, of  
8  
9 course, were all the more valid for a country with less solvency and less advanced infrastructure like  
10  
11 Pakistan.<sup>63</sup> In this broader context, although the AECL strongly emphasised the importance of  
12  
13 exporting without delay to maintain the balance of the Canadian nuclear industry, the success of the  
14  
15 project was not a foregone conclusion.<sup>64</sup>  
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18  
19 It was pointed out that the Canadian government was sensitive to Pakistani concerns about the  
20  
21 military aid provided to India in the 1962 war and that, in the autumn of 1963, Bhutto had been  
22  
23 pressing Prime Minister Pearson about the Kanupp project.<sup>65</sup> However, this does not seem to have  
24  
25 had any significant influence and, although he did indeed intervene on several occasions, even at the  
26  
27 end of December 1963, Bhutto did not appear particularly well informed on the issue.<sup>66</sup>  
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30  
31 The key point was actually the slow Canadian decision-making process, especially around Christmas,  
32  
33 which gave the Pakistanis time to get organised. At a time when it was President Ayub Khan himself  
34  
35 who was calling for funding to be negotiated, the political reasons in favour the project came back to  
36  
37 the fore, while commercial interests remained unchanged. Moran, in particular, who had been  
38  
39 sceptical up to that point, started to argue in favour of going ahead so as not to give the Pakistanis  
40  
41 any further cause for dissatisfaction. The Department of Finance continued to oppose the project and  
42  
43 thought it could be dropped without damaging relations with Pakistan by exploiting the World Bank's  
44  
45 discontent. As Deputy Finance Minister Robert Bryce explained to the Undersecretary for Foreign  
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47 Affairs Marcel Cadieux, Pakistan would have to justify Kanupp to the World Bank and the  
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54 <sup>62</sup> 'Burge to Reid', 23.03.66; 'Reid to Burge', 25.03.66, RG19 V5290 F7979 I39 8 (2), LAC. Bruce Muirhead, 'The Radical  
55  
56 Banker: Escott Reid, the World Bank, and Aid to India, 1962-65', in *Escott Reid: Diplomat and Scholar* eds. Greg Donaghy  
57  
58 and Stéphane Roussel (Montreal: McGill-Queen's University Press, 2004), 85-100.

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60 <sup>63</sup> 'Memo by Reid', 30.06.64, RG19 V3869 F8342 P152 5 5 1 (5), LAC.

<sup>64</sup> 'Gray to Moran', 22.11.63; 'memo by Plumpré', 05.12.63; 'Bryce to Gray', 04.01.64, RG19 V3869 F8342 P152 5 5 1 (1), LAC.

<sup>65</sup> Ryan Touhey, "'A One-Way Street': The Limits of Canada's Aid Relations with Pakistan 1958-1972', in *A Samaritan State Revisited*, cit., Kindle ed. pos. 2340-66.

<sup>66</sup> 'Karachi to DEA', tel. 845, 21.12.63, RG19 V3869 F8342 P152 5 5 1 (1), LAC.

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3 Consortium, and the responsibility for the rejection would be attributed to the multilateral  
4 development aid mechanisms.<sup>67</sup>  
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7  
8 The occasion was to be the study that the World Bank was organising to address comprehensively  
9 the issue of water management and energy resources in West Pakistan. Coordinated by Executive  
10 Director Pieter Lieftinck, the study was to be completed in 1967 and would effectively assign a  
11 subsidiary role to nuclear power, envisaging the construction of two medium-sized nuclear power  
12 plants in the 1980s.<sup>68</sup> If Kanupp had been included, the project would have been shelved for years.  
13  
14 Once again, however, Canadian slowness gave the Pakistani government time to include Kanupp as  
15 a target for 1964-65 and present it to the Consortium. At that point - when the project was officially  
16 presented - the idea prevailed that it was a matter for the Canadians as financiers to decide. Then it  
17 would have been unusual in the Consortium to object to the priority given to a project, and the  
18 Pakistanis were well aware of this. The Canadians, on their part, while not willing to compromise on  
19 the issue of increasing Pakistan's quota of Colombo aid at the detriment of other recipients, were now  
20 disposed to fund the whole foreign currency cost of Kanupp through soft loans by the External Aid  
21 Office (which were additional to direct Colombo aid) and credits by the Export Credit Insurance  
22 Corporation<sup>69</sup>  
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40 Indeed, the Department of Finance found itself isolated. Moran, Foreign Secretary Paul Martin and  
41 Pearson himself - on whom Ayub Khan had again put pressure during the Commonwealth Prime  
42 Ministers' Conference in July – cited reasons of political expediency. Firstly, after the signing of the  
43 Rajasthan contract in December 1963, it was necessary to ensure that neither the Pakistani  
44 government nor public opinion would find grounds to accuse Canada of discriminating in favour of  
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55 <sup>67</sup> 'Karachi to DEA', tel. 51, 20.01.64; 'Moran to Bryce', 23.01.64; 'Gray to Bryce', 24.01.64; 'memo by Hollbach', 06.02.64;  
56 'Bryce to Cadieux', 18.03.64, RG19 V3869 F8342 P152 5 5 1 (1), LAC. As former High Commissioner to Pakistan and first  
57 director general of External Aid Office, Moran had consistently maintained that political, rather than commercial,  
58 consideration should govern Canada aid policy. See John Hilliker and Donald Barry, *Le ministère des Affaires extérieures*  
59 *du Canada*, vol. II: *L'essor, 1946-1968* (Ottawa: University of Ottawa Press, 2017), 172-3.

60 <sup>68</sup> Pieter Lieftinck, ed., *Water and Power Resources of West Pakistan. A Study in Sector Planning* – vol. I: *The Main Report*  
(Baltimore: Johns Hopkins Press, 1968), 161-9.

<sup>69</sup> 'Karachi to DEA', tel. 225, 03.04.64; 'note for the file', 28.05.64, RG19 V3869 F8342 P152 5 5 1 (2), LAC.

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3 India; secondly, any refusal, by contributing to Pakistani frustrations about the actual advantages of  
4 its western location, would pose the risk of altering the Cold War balance in the area; finally, the  
5 possible risks of nuclear proliferation appeared negligible as Pakistan had never objected to  
6 international safeguards. So, on October 6, 1964, the Canadian government finally decided that when  
7 CGE and the PAEC had reached an agreement, bilateral negotiations on Kanupp's financing would  
8 officially begin.<sup>70</sup>

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17 The agreement between CGE and the PAEC was slow in coming, as the two sides could not agree on  
18 the project costs, which tended to increase progressively.<sup>71</sup> This put Usmani in a difficult position  
19 and, in the autumn of 1964, he bluntly expressed his frustration in a personal letter to Salam: 'There's  
20 no decision on Karachi reactor. CGE idiots are not in the mood to lower their prices [...] but Shoaib  
21 saab isn't agreeing, though he will.'<sup>72</sup>

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<sup>70</sup> 'Stoner to Plumptré', 14.05.64, RG19 V3869 F8342 P152 5 5 1 (2), LAC. 'Memo by Martin', 09.07.64; 'Pearson to Ayub Khan', 04.08.64; 'memo by Wardroper', 07.08.64, RG19 V3869 F8342 P152 5 5 1 (5), LAC. 'Memo by Hudon', 08.09.64; 'meeting of ministers held on October 6, 1964', RG19 V3869 F8342 P152 5 5 1 (6), LAC.

<sup>71</sup> 'Memo by Hollbach', 23.06.64, RG19 V3869 F8342 P152 5 5 1 (4), LAC.

<sup>72</sup> 'Usmani to Salam' (in Urdu), 04.11.64, M88, ASP.

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3 nuclear weapons -<sup>73</sup> required Pakistan to request that the same safeguards be applied to Kanupp as  
4  
5 were applied to the Rajasthan reactor.<sup>74</sup>  
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8 The request was an unexpected volte-face for the Canadians, since, as late as autumn 1963, Pakistan  
9  
10 had publicly rejected India's claim that international safeguards were a form of discrimination against  
11  
12 developing countries. In addition, the conditions agreed for the Rajasthan reactor, which had been  
13  
14 questioned by the Canadian Atomic Energy Control Board because the IAEA safeguards remained  
15  
16 merely a possibility and bilateral inspections were concerted activities, were justified in the light of  
17  
18 what was termed a 'special relationship' in which, as well as playing a much more active role in the  
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20 construction of the plant, the Indians would benefit from extensive technical cooperation on the  
21  
22 natural-uranium heavy-water reactor type.<sup>75</sup>  
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26 None of this was applicable to the Pakistani case. It then became apparent that there were deep  
27  
28 divisions on this issue, as the Canadian High Commissioner reported after a stormy New Year's Eve  
29  
30 reception:  
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35 It was both an unpleasant and revealing session at which I was an embarrassed spectator much of the time because Shahi  
36  
37 and Usmani were clearly very hostile though icily polite. Shahi was categorical that [...] Pakistan would be satisfied with  
38  
39 nothing less, or different, than the terms used in the India-CDA agreement or the Rajasthan reactor [...]. At this point  
40  
41 Usmani [...] said it might be foreign office policy [...] he and Said Hasan [vice president, Pakistan Planning Commission]  
42  
43 and Osman Ali [secretary, Economic Affairs Division – Ministry of Finance] had not been consulted.<sup>76</sup>  
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47 This unprecedented convergence between Usmani and the economic authorities against the positions  
48  
49 taken by the Foreign Ministry, supported in particular by Bhutto and the Undersecretary, Aziz  
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54 <sup>73</sup> Quoted in Mohammad Badrul Alam, *India's Nuclear Policy* (Mittal Publications: New Delhi, 1988), 23.

55 <sup>74</sup> 'DEA to Karachi', tel. 2591, 31.12.64, RG19 V3869 F8342 P152 5 5 1 (6), LAC. 'Karachi to DEA', tel. 602, 29.08.64, RG19  
56 V5290 F7979 I39 7 (4), LAC. 'Memo by Hollbach', 27.11.64, RG19 V4487 F7979 I39 1 (1), LAC. See also Perkovich, *India's  
57 Nuclear Bomb*, cit., 64-83.

58 <sup>75</sup> 'Karachi to DEA', tel. 15, 05.01.65, RG19 V3869 F8342 P152 5 5 1 (6), LAC. 'Memo by Laurence', 20.06.63, RG19 V5290  
59 F7979 I39 7 (3), LAC. 'Agreement between the Government of Canada and the Government of India relating to the  
60 Rajasthan Atomic Power Station and the Douglas Point nuclear generating Station', 16.12.63; 'agreement made on  
December 16, 1963 between AECL and the President of India, RG20 V1672 F3 51 1 (2), LAC.

<sup>76</sup> 'Karachi to DEA', tel. 1, 02.01.65, RG19 V3869 F8342 P152 5 5 1 (6), LAC.

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2  
3 Ahmed, betrayed diverging visions of Pakistan's development and international role. In short,  
4 whether the country should continue along the road of alignment with the or accept the consequences  
5 of the process of rapprochement with the Communist world. The Chinese nuclear test - warmly  
6 welcomed in Pakistan - sent anti-Indian and anti-Western tremors into overdrive. Above all, it was a  
7 reason for Asian pride that foreshadowed new prospects.<sup>77</sup> China became an example as the Bengali  
8 newspaper *Azhad* said: 'Those who see Coca-Cola and nylon as signs of progress must understand,  
9 their power and freedom depend on the atomic bomb.'<sup>78</sup> China, then, could be not simply a partner  
10 of interest against India, but a different and fascinating model of development based on  
11 self-reliance.<sup>79</sup>

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24 The Canadians might have missed the nuances and some of the implications, but not the fact that the  
25 failure of the Kanupp project would contribute to further undermining relations with the West. On  
26 the other hand, Ottawa felt that it was not possible to agree to Pakistan's requests, all the more so  
27 because they were not supported unanimously. The situation was unblocked only in mid-February,  
28 when Ayub Khan, who had become accessible again after the elections of January 2, 1965, tipped the  
29 balance in favour of Usmani and the economic leaders. Pakistan thus asked for negotiations to begin,  
30 in which the safeguards would be discussed as flexibly as possible so as to find a compromise solution  
31 that incorporated the core of Canadian demands while saving the face of the Foreign Ministry.  
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Certainly, agreeing to negotiate from such distant positions was a risk, but one that the Canadian  
government chose to take to strengthen what it saw as pro-Western elements in the Pakistani  
government.<sup>80</sup>

On February 13, 1965, Canada submitted the draft for a bilateral agreement defining safeguards for  
the plant and, above all, stating that the application of the IAEA regime would apply one year after

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<sup>77</sup> 'Reactions to China's nuclear test', 19.05.65 at <https://digitalarchive.wilsoncenter.org/document/134735>.

<sup>78</sup> 'Pakistan's Reaction to China's Nuclear Explosion', 20.10.64 at <https://digitalarchive.wilsoncenter.org/document/134754>

<sup>79</sup> 'Salam's report on the visit to China', March 1965, M201, ASP.

<sup>80</sup> 'Washington to DEA', tel. 100, 12.01.65; 'Karachi to DEA', tel. 36, 13.01.65; 'DEA to Karachi', tel. 78, 13.01.65; 'Karachi to DEA', tel. 45, 18.01.65; 'memo by Hudon', 20.01.65, RG19 V3869 F8342 P152 5 5 1 (6), LAC.



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3 the entry into force of the agreement. However, this last point did not appear in the final version of  
4  
5 the agreement, signed on February 25. Usmani, in fact, had once again insisted on following the  
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7 Rajasthan model as closely as possible and, in line with the 'encouragement' policy adopted, the  
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9 Canadians had decided to add a limited information exchange programme to parallel what had been  
10  
11 stipulated with India and, above all, to remove that clause, despite the DEA's concerns.<sup>81</sup>  
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14 This was a mistake. When the IAEA international regime was enacted in September 1965,<sup>82</sup> the  
15  
16 Canadians urged Pakistan to adopt it immediately, assuming that this was the logical course of action,  
17  
18 but the Pakistani reaction was so negative that it was again decided not to insist, so as not to cause  
19  
20 further animosity in the immediate aftermath of the Kashmir war and in the face of unresolved funding  
21  
22 uncertainties.<sup>83</sup>  
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26 A strategy aimed at maintaining good relations with Pakistan was having increasingly  
27  
28 counterproductive effects. Things came to a head in the summer of 1969 when, with the reactor almost  
29  
30 completed, the Canadians were unable to supply the heavy water to start it up because of delays in  
31  
32 creating their own production capacity. The only alternative was to turn to the US, but Washington -  
33  
34 after the conclusion of the non-proliferation treaty - made it a condition that the Pakistanis must accept  
35  
36 the IAEA safeguards. An uproar ensued at the PAEC.  
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41 Dr. Usmani further emphasized the point that if the Canadian Government did not agree to extend the same treatment as  
42  
43 was extended to India [...], the Commission might have to take the extreme step of holding up work at Kanupp [...]. Prof.  
44  
45 Salam was of the view that Pakistan should [...] insist on an agreement similar to that between Canada and India, [...]  
46  
47 incorporating exactly those provisions as were agreed upon between Canada and India. The Members of the Commission  
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55 <sup>81</sup> 'DEA to Karachi', tel. 350, 13.02.65; 'Wardroper to Brache', 26.02.65, RG19 V3869 F8342 P152 5 5 1 (6), LAC.

56 <sup>82</sup> International Atomic Energy Agency, *The Agency's Safeguards System (1965)*, INFCIRC/66, December 3, 1965.

57 <sup>83</sup> 'DEA to Karachi', tel. 2607, 22.11.65, RG19 V3869 F8342 P152 5 5 1 (7), LAC. This is the context of the reported refusal  
58 by Ayub Khan to proliferate on the ground that – if needed – Pakistan could get the bomb "off the shelf" (cf. Khan,  
59 *Eating Grass*, cit.: 62). PAEC documents indirectly confirm that talks on proliferation did take place, as it was decided  
60 that secret matters should not be put on record ('minutes of 6<sup>th</sup> PAEC meeting', 30.12.66, M131, ASP) Since issues  
regarding the fuel cycle including reprocessing continued to be recorded at least until the end of 1973, it is very likely  
that the 'secret matters' were the kind of initiatives as reported by Feroz Khan.

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3 unanimously agreed with this stand of Prof. Salam and requested him kindly to bring this to the notice of the President of  
4 Pakistan when he next called on him.<sup>84</sup>  
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9 The problem was always that of the link between the Rajasthan and Kanupp projects. The Canadians  
10 were aware of this and, in early 1966, they had considered taking advantage of the deaths of Homi  
11 Bhabha, the director of the Indian nuclear effort, and Prime Minister Shastri to make it compulsory  
12 for safeguards to be handed over to the IAEA during the construction of the second reactor in  
13 Rajasthan, thus avoiding problems with the Pakistanis. However, they had desisted in the face of  
14 Indian opposition.<sup>85</sup> In the case of Kanupp, on the other hand, there was no stepping back, except for  
15 a few measures to save face with the Pakistanis without altering the substance of the project, such as  
16 formal reciprocity of the safeguards. The immediate application of the IAEA safeguards was imposed  
17 through a formal trilateral agreement between Pakistan, Canada and the Agency, without any grace  
18 period as in the case of Rajasthan. The government in Islamabad, despite the opposition of the PAEC,  
19 was forced to accept the conditions to avoid finding itself with an expensive plant that was unusable.<sup>86</sup>  
20  
21 The contract with the CGE was signed on May 25, 1965 amid growing tensions over Kashmir, and  
22 the crucial question of government funding remained unsettled until the very end, as Canada decided  
23 in September to freeze further aid to India and Pakistan in view of the precarious ceasefire. This last  
24 piece of the puzzle could not be put in place first because of the conflict over Kashmir and, secondly,  
25 it was overshadowed by the Canadian federal elections of November 1965. It was the financially  
26 exposed CGE that urged a decision and this was favourable, not so much because of commercial  
27 interests, but rather because the DEA had come to the conclusion that, in the event of the project  
28 failing, the negative effects on relations with Pakistan would be more far-reaching than those of  
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55 <sup>84</sup> 'Minutes of the 16<sup>th</sup> meeting of PAEC', 02.08.69, M149, ASP.

56 <sup>85</sup> 'Delhi to DEA', tel. 192, 07.02.66; 'Delhi to DEA', tel. 897, 13.05.66, RG19 V5290 F7979 I39 8 (2), LAC. 'Delhi to DEA',  
57 tel. 2737, 15.12.66, RG19 V5290 F7979 I39 8 (3), LAC. See Touhey, "A One-Way Street", cit., pos. 2444-90.

58 <sup>86</sup> 'Trilateral agreement between Canada, Pakistan and the IAEA, working paper for the 17<sup>th</sup> meeting of PAEC on October  
59 30, 1969', M152, ASP. 'Minutes of the 17<sup>th</sup> meeting of PAEC', 30.10.69, M153, ASP. International Atomic Energy Agency,  
60 *Safeguards Transfer Agreement Relating to the Bilateral Agreement Between Pakistan and Canada*, INFCIRC/135, November 13, 1969.

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2  
3 building another Canadian reactor on the subcontinent, when India's possible military programme  
4  
5 was uncertain.<sup>87</sup>  
6

7 While remaining member of both SEATO and the Baghdad Pact, since the early 1960s Pakistan had  
8  
9 begun a slow and sometime contradictory reorientation of its foreign policy. Confronted with the US  
10  
11 efforts to relaunch relations with India, which escalated after the Sino-Indian border clash in October  
12  
13 1962, the Pakistanis elite saw their alliance with Washington increasingly ineffective and  
14  
15 implemented a policy of differentiation. If the latter was publicly based on the idea of keeping good  
16  
17 bilateral relations with both superpowers and China, it tried to take advantage from US/USSR and  
18  
19 India/China tensions to strengthen Pakistan's geostrategic position and to reap benefits for its  
20  
21 development policies<sup>88</sup>. The process was stepped up in conjunction with the 1965 Indo-Pakistani war,  
22  
23 but while increasingly positive dealings with China galled the Johnson Administration at the point of  
24  
25 souring US-Pakistani bilateral relations, the matter was different as far as Canada was concerned. In  
26  
27 the memorandum prepared by the DEA, in fact, the crucial aspect was Pakistan's political orientation  
28  
29 in the Cold War and the balance of relations on the subcontinent.  
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37 Because of the substantial assistance Canada has given to India in the atomic energy field, it is certain that the Pakistan  
38  
39 Government and public alike would react very badly indeed if Canada should decline to give comparable support to  
40  
41 Pakistan. [...] Canadian association with a project which has assumed such national importance in Pakistan is likely to  
42  
43 yield substantial long-term benefits to Canada, and taking into account the present situation in Pakistan, could favourably  
44  
45 influence the country's general orientation. [...] Admittedly there would be great pressures in Pakistan to produce atomic  
46  
47 weapons if India should explode a nuclear device, but if this is a valid objection it would permanently rule out nuclear  
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49 power development in Pakistan.<sup>89</sup>  
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57 <sup>87</sup> 'Memo by Barry', 07.12.65; 'record of Cabinet decisions – meeting of December 8, 1965', RG19 V3869 F8342 P152 5  
58 5 1 (7), LAC.

59 <sup>88</sup> Cf. Vyacheslav Belokrenitsky and Vladimir Moskalenko, *A Political History of Pakistan 1947-2007* (Oxford: OUP, 2013),  
60 138-42, 188-93; Robert S. MacMahon, *Cold War on the Periphery* (New York: Columbia University Press, 1996): 296-335.

<sup>89</sup> 'Memo by the Foreign Secretary to the Cabinet', 06.12.65, RG19 V3869 F8342 P152 5 5 1 (7), LAC.

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3 The intergovernmental financing agreement was thus signed on December 23. The foreign currency  
4 component of the project had rose to \$48 million – entirely provided by Canada against a grand total  
5 of \$230 million in grants and food aid by the end of 1965<sup>90</sup> - or £17 million against roughly £25  
6 million of the original UKAEA quote. Anyway, the Head of the Economic Affairs Division of the  
7 Pakistani Ministry of Finance, Osman Ali, who signed the agreement, categorically refused to include  
8 in the joint communiqué the final paragraph prepared by the Canadians emphasising the exclusively  
9 peaceful purposes of the Kanupp reactor, arguing that this was already evident in itself.<sup>91</sup>  
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## 21 Conclusions

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24 This contribution points out the importance of the UK-Canada-Pakistan triangular relationship for the  
25 study of Pakistan's early nuclear history. The latter made sense only in the context of competitive  
26 coexistence and epitomized both the importance and room of manoeuvre of actors other than the  
27 superpowers, as well as the interconnection between regional politics and the global Cold War. If  
28 Kanupp was part of a greater design for the modernization of Pakistan, the final decision that made it  
29 possible was determined by Canadian anxieties about South Asia's trajectory in the Cold War.  
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37 In spite of problems, delays and inefficiencies, the construction of Kanupp was an undoubted success  
38 for the Pakistanis in terms of staff training. From 1966 to 1970, 32 people, plus the technicians sent  
39 to Tokyo to follow the completion of the Hitachi turbogenerators, were trained in Canada according  
40 to a precise plan that was an integral part of the CGE offer, but with the important difference that it  
41 was not financed by the Pakistanis as initially planned, but by Colombo funds. This core team was  
42 able to actively supervise the commissioning of the reactor and train additional Pakistani personnel  
43 on site, enabling the PAEC to become autonomous for operation and maintenance by the summer of  
44 1973.<sup>92</sup>  
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58 <sup>90</sup> 'Briefing note', 18.02.66, RG25 V10055 F20-1-2-PAK, LAC.

59 <sup>91</sup> 'Karachi to DEA', tel. 1237, 24.12.65, RG19 V3869 F8342 P152 5 5 1 (7), LAC.

60 <sup>92</sup> 'Minute of the 1<sup>st</sup> meeting of the PAEC', 28.08.65, M127, ASP. 'Monthly progress report – December 1965, M96, ASP. 'Reconstitution of nuclear safety committee', November 1967, M136, ASP. 'Review of projects and schemes, working

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3 This was a significant achievement in view of the initial conditions and it was a positive sign of the  
4 efforts made by the PAEC under the leadership of Usmani and Salam. The pair had inherited an  
5 atomic programme that was already broadly outlined, but struggling. They infused it with new energy  
6 and vision. Thus, Kanupp was both an unexpected realisation of already formulated ambitions and  
7 the starting point for more articulated visions of development and modernisation for Pakistan, a  
8 possible vehicle for nuclear nation-building.<sup>93</sup>

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17 In 1978 Bhutto, from the prisons of General Zia-ul-Haq, attributed all the achievements of Pakistan's  
18 atomic programme to his own indefatigable militancy,<sup>94</sup> but this is not what seems to emerge from  
19 the documentation. Certainly, he was an early and decisive supporter of the programme<sup>95</sup> - in fact,  
20 once removed from government, the former foreign minister systematically made the necessity of the  
21 nuclear deterrent his favourite topic -<sup>96</sup> but in this affair, he does not appear to be either particularly  
22 in the know, or in tune with the Usmani-Salam duo. They were the real architects of the success  
23 insofar as they were able to put forward a credible argument in favour of the construction of the  
24 nuclear power plant, and more generally, of the atomic programme of a very poor country, skilfully  
25 using multilateral contacts. If the international position of early 1960s Pakistan did not allow to play  
26 on Cold War divides like India was able to do,<sup>97</sup> nevertheless its policy of differentiation exerted an  
27 influence in terms of self-inducement – at least for Canada. More significant was, if anything, the  
28 weight of Ayub Khan, not because he had a deeper knowledge of nuclear power,<sup>98</sup> but because of the  
29 nature of his role and because his government found its rationale in the modernisation effort.

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51 paper for the 20<sup>th</sup> meeting of PAEC on May 21, 1970, M157, ASP. 'Minutes of the 31<sup>st</sup> meeting of PAEC held on August  
52 24, 1973', M165, ASP.

53 <sup>93</sup> On this concept see Gabrielle Hecht, *The Radiance of France. Nuclear Power and National Identity after World War II*  
54 (Cambridge: MIT Press, 2000).

55 <sup>94</sup> Zulfikar Ali Bhutto, *If I am Assassinated* (New Delhi: Vikas Publishing, 1979), 165-6.

56 <sup>95</sup> 'Bhutto to Pearson', 05.08.64, RG19 V3869 F8342-P152-5-5-1 (5), LAC.

57 <sup>96</sup> Zulfikar Ali Bhutto, *The Myth of Independence* (New York: OUP, 1969): 120-30.

58 <sup>97</sup> David Engerman, *The Price of Aid. The Economic Cold War in India* (Cambridge: Harvard University Press, 2018): 148-  
59 55.

60 <sup>98</sup> Ayub's uncertain command of simple technical terms is revealing. See Mohammad Ayub Khan, *Friends Not Masters: A Political Autobiography* (New York: OUP, 1967), 173-4.

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3 Certainly, the internal tensions within the Pakistani administration, the World Bank's criticism and  
4 the attempts of the economic authorities to block the project by leaning on the latter, confirm how the  
5 term 'modernisation' was anything but univocal, responding to political tensions and paradigm shifts  
6 in economic development, which is one of the fundamental dimensions of the Cold War.<sup>99</sup> From this  
7 point of view, the Kanupp affair shows how local and global demands intertwine, with the surprising  
8 alliance between the PAEC and the economic authorities against the 'hawks' in the Foreign Ministry.  
9 The attempt to block the project failed because it attributed to the World Bank a desire for direction  
10 and initiative that the institution did not actually have. In fact, doubts and criticisms aside, the  
11 relationship with Pakistan continued to be characterised by a substantial acquiescence to Islamabad's  
12 policies and by the search for non-confrontational relations.<sup>100</sup>

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3 centred on the economic plausibility of a technological investment both to provide the electricity  
4 needed for industrial growth and to modernise an underdeveloped country more broadly, which was  
5 essentially the same argument put forward as that of Usmani and Salam. So, while the main issue was  
6 undoubtedly Canada's aid-to-development policy, it was not the only one.  
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12 Towards the end of the 1960s, this Canadian capacity for external projection through aid was already  
13 the object of criticism;<sup>103</sup> more recently, there has been talk of a conceptual incoherence between  
14 promises of development, commercial interests and foreign policy requirements<sup>104</sup> and, in the specific  
15 case of nuclear assistance to India and Pakistan, it has been stressed that the priority given to  
16 commercial reasons has led to dangerous short circuits with regard to non-proliferation demands.<sup>105</sup>  
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18 On the contrary, it emerges from this study that those reasons, though present and duly considered,  
19 were never the decisive ones in Pakistan's case. If Canada turned a 'blind eye' to Pakistan,<sup>106</sup> the  
20 reasons were less opportunistic than they might appear *prima facie* and included a firm belief in the  
21 potential of peaceful atom for the subcontinent, which should not be foregone in advance out of fear  
22 of proliferation.  
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35 India might have been a problematic partner, but it undoubtedly offered wider prospects; in the case  
36 of Pakistan, the decisive reasons for the choices were political, as shown by the Department of  
37 Finance's ineffective resistance to the project. A first order of issues concerned Pakistan's  
38 increasingly uncertain collocation in the Cold War; a second order of issues was that of bilateral  
39 relations, always considered through the prism of the difficult relationship between India and  
40 Pakistan. Whether the translation of these reasons into practice was effective is another matter.  
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56 <sup>103</sup> Keith Spicer, *A Samaritan State? External Aid in Canada's Foreign Policy* (Toronto: University of Toronto Press, 1967).

57 <sup>104</sup> Ian Smillie, 'Foreign Aid and Canadian Purpose: Influence and Policy in Canada's Development Assistance' in *Canada  
58 Among Nations 2008. 100 Years of Canadian Foreign Policy*, eds. Robert Bothwell and Jean Daudelin (Montreal: McGill-  
59 Queen's University Press, 2009), 183-208.

60 <sup>105</sup> Duane Bratt, *The Politics of CANDU Exports* (Toronto: University of Toronto Press, 2006).

<sup>106</sup> Cf. Rabia Akhtar, *The Blind Eye. US Non-Proliferation Policy Towards Pakistan from Ford to Clinton* (Lahore: University of Lahore Press, 2018).

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3 Washington or London, but the decisions were the result of slow and not always well coordinated  
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5 processes.  
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8 The 'India factor' deserves special consideration. This was a characteristic endogenous to Pakistani  
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10 decision-making, often resented as an unnecessary complication, generated by an unacknowledged  
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12 sense of inferiority towards India, which would be at the root of the nuclear proliferation. Even  
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14 authors who tend to downplay its centrality in Pakistan's nuclear policy still consider it an endogenous  
15  
16 factor.<sup>107</sup> The Kanupp affair, however, also brings out an exogenous dimension. In the British or  
17  
18 Canadian documentation, it is practically impossible to find a judgement on Pakistan which is not  
19  
20 formulated without taking into account its complicated relations with India. In short, the 'India factor'  
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22 is not only a Pakistani attitude, but also an objective international dimension imposed on Pakistan by  
23  
24 other actors, influencing its decision-making processes. The 'India factor,' thus, becomes a vicious  
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26 circle that makes the attribution of responsibility very complicated.  
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30 Paradoxically, Pakistan's position in the Western world was to its disadvantage because it could be  
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32 taken for granted. When it became clear that this was no longer the case, the Kanupp project did not  
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34 represent so much an adventurous commercial operation as an element of a more general policy of  
35  
36 prudent adaptation aimed at keeping Pakistan in the orbit of the free world and limiting the tensions  
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38 with India. An action with contradictory results, mixing principles and pragmatism:<sup>108</sup> too little to  
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40 avoid Pakistan's rapprochement to the communist world, but too much in terms of potential nuclear  
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42 proliferation.  
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59 <sup>107</sup> See Ashok Kapur, *Pakistan's Nuclear Development* (New York: Croom Helm, 1987): 77-81.

60 <sup>108</sup> See Ryan Touhey, 'Commonwealth Conundrums: Canada's foreign Relations with South Asia during the Pearson Era' in *Mike's World. Lester Pearson and Canadian External Relations, 1963-1968*, eds. Asa Mckercher and Galen Perras (Vancouver: UBC Press, 2017), 251-76.