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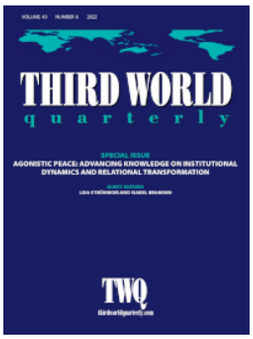

Routledge
Taylor & Francis Group

Third World Quarterly

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/ctwq20

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To cite this article: Hebatalla Taha (2022) Hiroshima in Egypt: interpretations and imaginations of the atomic age, Third World Quarterly, 43:6, 1460-1477, DOI: 10.1080/01436597.2022.2059461

To link to this article: https://doi.org/10.1080/01436597.2022.2059461

Published online: 13 Apr 2022.

THIRD WORLD QUARTERLY
2022, VOL. 43, NO. 6, 1460–1477
https://doi.org/10.1080/01436597.2022.2059461

Hiroshima in Egypt: interpretations and imaginations of the atomic age

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ABSTRACT

This article focuses on Egyptian interpretations of the atomic bombings of Hiroshima and Nagasaki by the US at the end of the Second World War. It surveys the reactions and responses of influential thinkers between 1945 and 1951, a crucial period prior to decolonisation. The objective of this research is to capture a specific moment in time and understand how it shaped imaginations of the future. The article argues that the bombings of Japan generated fantasies and anxieties about the postcolonial future. Intellectuals were enthusiastic about the possibilities of nuclear science and energy, but at the same time they engaged in nuanced and critical debates about the emergence of a nuclear-armed world, including its intertwinement with race and colonial power. In addition to exploring Egyptian thought on the nuclear condition, this historical analysis allows us to better understand Egyptian nuclear decision-making after independence. Revisiting this period, furthermore, illustrates the importance of imagined futures in shaping nuclear choices.

ARTICLE HISTORY
Received 28 March 2020
Accepted 23 March 2022

KEYWORDS
Egypt
Hiroshima
nuclear weapons
atomic science
technology
decolonisation

Introduction

On 8 August 1945, Ahmad Zaki 'Akif (1894–1975), a prominent Egyptian chemist, wrote an op-ed in *al-Ahram*, the largest Egyptian daily newspaper, reflecting on the bombing of Hiroshima, which had taken place three days earlier. The atomic bomb, he declared, signalled that the world had entered a new epoch. Using Hiroshima as a point of departure, 'Akif (1945) focused on the scientific implications, describing atomic technology as a dream that had finally come true and highlighting the importance of faith in science. The second bomb had not yet been dropped on Nagasaki, but like many scientists around the world who were euphoric about the possibilities of atomic science, 'Akif was already considering how this new epoch would re-organise society and the economy. Founder of the Egyptian Academy of Scientific Research and Technology and the National Research Center, 'Akif became the country's first postcolonial Minister of Social Affairs in 1952. By 1957, he had published

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This article has been republished with minor changes. These changes do not impact the academic content of the article.

commentary urging Egypt to build a bomb, citing the security it would offer in an increasingly nuclearised world, as well as its potential for securing peace due to fears of mutual destruction (Akif 1957). In addition to portending the Egyptian government's short-lived interest in procuring nuclear weapons (Rublee 2006), the 1957 text reflected the consolidation of a global nuclear discourse. It reproduced the intellectual prisms and lexicon that were crafted in the beginning of the Cold War, which traversed linguistic and geographic boundaries, and which have been used to understand and govern knowledge on nuclear politics until the present day.

This article aims to understand how Egyptian intellectuals made sense of the atomic bombings prior to the emergence of dominant modes of nuclear thought, including discourses, norms, and institutions that have ultimately become entrenched within international politics (Bernstein 1993; Considine 2021; Egeland 2021). How were the bombings of Japan understood and discussed by intellectuals in Egypt in this early period? In particular, how did the bombings shape their imaginations of the future? To answer these questions and to capture this specific moment in time, the article excavates written sources dealing with the atomic age in Egypt in the period between 1945 and 1951, when the meanings of the bomb were still in flux, being contested, made and re-made. This period was also marked by the rise of fervent nationalism in Egypt, inspiring radical imaginations of the postcolonial future.

Rather than offering a complete intellectual history of this period, I focus on the reactions and responses of several influential thinkers whose voices represent examples of Egyptian engagement with the nuclear condition. The article demonstrates that the bombings of Japan constituted a rupture within the thought of nationalist intellectuals, affecting their imaginations of the future. I argue that this was expressed through both fantasies and anxieties pertaining to decolonisation. Egyptian thinkers perceived the atomic age as posing threats to the emerging postcolonial nation, heralding a new era of Western violence and racism, but they simultaneously regarded it as offering opportunities through the potential and promise of atomic technology and science to shape the nation.

The article takes seriously the suggestion by Shampa Biswas (2014) to listen to voices speaking on nuclearism beneath and beyond the state. This is particularly pertinent in non-Western contexts, which have regularly been studied through the lens of proliferation (Gusterson 1999, 113–114; Pelopidas 2022, 33–58). While the International Relations literature has recently re-conceptualised the bombing of Japan as a global event (Gordin and Ikenberry 2020), there is no scholarly work dedicated to understanding how it was interpreted within Arab political thought. Revisiting the bombings of Japan from an Egyptian perspective adds a voice from the Middle East to this literature and initiates a conversation on how this region experienced the so-called nuclear revolution (Mandelbaum 1981). The article does not intend to be conclusive but rather means to offer a window into Arab nuclear thought and encourage further scholarly input on the subject.

The rest of the article is structured as follows. I start by explaining the focus on imagined futures and outlining the sources used in this research. Next, I offer an overview of Egyptian colonial history, the intellectuals whose voices make up the article, and the literature on Global Hiroshima in International Relations. I proceed to analyse the interpretations and imaginations of Egyptian intellectuals after the bombing, in three sections. The first focuses on colonialism, militarism and race; the second on science and nation; and the third on visions of a techno-utopia. As I will show, these were not separate ways to understand the

bombings but were deeply intertwined. Scathing critiques and anxieties regarding the bomb's role in creating a new militarised and racialised structure comfortably coexisted with arguments in favour of indigenous science's capability to enrich the postcolonial state, and even faith in atomic technology's potential to radically restructure society. The conclusion discusses Egypt's nuclear programme in the postcolonial period, while reflecting on the wider implications of the study.

Imagined futures as method

Rather than study Hiroshima as memory, this article focuses on how the bombings of Japan shaped ideas of the future. According to Jenny Andersson, the future became a 'hollowed out category' after the Second World War, creating myriad new forms of speculation and prediction (2018, 1–5). Imagining the future reflected both science and politics, combining new forms of knowledge, technologies and expertise. This was arguably even more pronounced in the pivotal moment and context of de-colonisation when intellectuals were radically and actively re-imagining the nation. Indulging and analysing imagined futures, as a methodological approach, enables scholars to challenge the Panglossian outlook that considers the current outcome as the most desirable or as inevitable, particularly vis-à-vis the nuclear-armed world (Pelopidas 2016; Pelopidas 2021). As Gabrielle Hecht (2012) has shown, the process by which actors or objects become identified as 'nuclear' is complex, involving colonial, racial and capitalist considerations, and thus needs to be deconstructed and historicised.

To shed light on how intellectuals understood the bomb and how it shaped their imaginations of the future, this study mobilises sources disseminated between 1945 and 1951, prior to the US withdrawal from Japan and prior to the coup that led to Egyptian independence from Britain, both of which took place in 1952. Unsurprisingly, there are continuities before and after Egyptian independence: as 'Akif's case suggests, the individuals in this article remained involved in discussions on science and technology in the postcolonial era, which did not necessarily represent a sharp disjuncture (Elshakry 2007, 198; Ryzova 2014, 250–251). Intellectuals during this period had diverse research agendas, dealing with topics as diverse as science and technology, philosophy and ethics, and language and literature. These communities were mostly comprised of literate and upwardly mobile men, a group that had formed as a distinct cultural representation of Western modernity in Egyptian society (Ryzova 2014, 8–10).

The sources used in this article are varied. *Al-Ahram*, a daily newspaper in circulation since the 1870s (with minor interruption), had a reputation as being influential and independent, although it faced pressure and censorship during the war (see Gorman 2010). Literary-scientific journals, which witnessed a marked increase from the late 1800s (Sheehi 2005), represent another set of sources. Intellectuals wrote across journals, which translated and re-published articles from international journals, including *Life, Reader's Digest* and *The New Yorker*. For example, the first part of John Hersey's highly influential essay 'Hiroshima' was translated and published in September 1947, a year after its original publication, in the journal *Al-Katib Al-Misri*. These publications paid special attention to science and technology: the journal *Al-Hilal*, for instance, had a recurring section entitled 'Science and the World', which documented new discoveries and developments. The final set of sources includes books about the bomb, written by scientists but aimed at the broader reading public.

These variegated genres enable an exploration of the emergence of nuclear thought and interpretations of the nuclear condition. The intellectual debates of the period were not confined to Egypt but travelled across the transregional Arab print market. In the 1940s *Al-Ahram* was flown daily into Palestine, where Egyptian journals had widespread subscription (Ayalon 2004, 52). Similarly, these publications were widely circulated and read in Iraq (Bashkin 2009, 60). Articles in literary-scientific journals were part of a regional conversation, often including authors from across the Arab world. This demonstrates that nuclear thought traversed not only official and secret spaces but also national borders and boundaries.

Egyptian colonial history, the role of intellectuals and Global Hiroshima

Egypt was not fully independent in 1945. It was governed by the 1936 Anglo–Egyptian treaty, which kept around 10,000 British troops in the country under the pretence of protecting the Suez Canal. However, there was an active and growing nationalist movement, and the period leading up to the Second World War was especially turbulent, with three separate and competing power bases in the country: the British, the king and nationalist political movements. The 1940s saw the rise of a new generation of intellectuals, who were more critical and politically aggressive, and they tended to embrace Islamism and Marxism as their favoured ideological vehicles of nationalist dissent (Elshakry 2013, 317). The upwardly mobile members of this new middle class, the protagonists of this article, had become 'the most important producers and consumers of nationalist imaginings' (Gershoni and Jankowski 2009, 216). In fact, they generally took the demand for independence as a point of departure. They advocated for an indigenous acquisition of science and set up institutions for scientific research and knowledge transmission (Rashed 2008, 533).

To capture an array of viewpoints expressed by nationalist thinkers, I focus on authors from different political and ideological backgrounds and from several epistemic communities – such as science, literature, media and art – who can all be considered public intellectuals. Their voices are used throughout the article as representatives of the broader political trends they identified with. The intellectuals are chosen because they were prominent commentators on atomic science and energy, yet they vary in their authority and influence. 'Ali Mustafa Musharafa and Ahmad Zaki 'Akif, for example, were leading commentators on science who fundamentally steered the national scientific sphere. Their voices are supplemented with those of popular science writers, such as Fawzi al-Shitwi, who wrote extensively on science in literary-cultural magazines and newspapers, and Muhammad 'Atif al-Barquqi, who published dozens of books simplifying the latest scientific developments and inventions. Meanwhile, 'Abbas al-'Aqqad and Sayyid Qutb shaped Egyptian political debates on liberalism and Islamism, respectively, and their influence on Arab political thought has been discussed in the academic literature (Calvert 2010; Gershoni 2016; Khalafallah 1995; Sabaseviciute 2018). While Georges Henein is known for his contributions to Egyptian surrealism (Bardaouil 2017), his political legacy and contributions to Egyptian Marxism and anti-fascism have increasingly attracted further study (Galián 2020, 116–123; Renton 2004, 82–103). Others, like journalist Muhammad Tawfiq Diab and philosopher 'Uthman Amin, are less well known but provide additional context. The authors all wrote in Arabic, with the exception of Henein, whose text was published in French.[1]

This article is primarily informed by the literature on Global Hiroshima in International Relations, which aims to understand the ways in which the emergence of a nuclearised world was a constitutive moment globally (Gordin and Ikenberry 2020; Rotter 2008; Taylor and Jacobs 2017). It is a reminder that intellectuals in the Middle East were critical of the nuclear condition, which they linked to colonialism, militarism and racism. These connections were also evident among black leftists in the US, for example (Intondi 2015, 9–28), and can be seen as part of a global intellectual project (Getachew 2019). In addition to empirically researching the origins of the nuclear-armed world, academic research has sought to undo the retroactive normalisation of the bombings of Hiroshima and Nagasaki as past nuclear events (Crépon 2019, 140–141; Neiman 2015; Zwigenberg 2014). It is worth noting that while 'Hiroshima' is often used to refer to the legacy of the bombings of Japan, I do not intend to create a hierarchy of Hiroshima over Nagasaki (Wellerstein 2015).

There here is significant overlap between the Egyptian case, where intellectuals wrote and thought about Hiroshima as reflecting tensions between prosperity and destruction, and other de-colonising contexts. For example, the case of India, which was also on the verge of de-colonisation in 1945, resembles Egypt – although the two ultimately adopted different paths vis-à-vis nuclear weapons, with Egypt refraining from building a bomb. Indian political leaders such as Jawaharlal Nehru described the bomb as a 'horrendous' revolution but also as containing 'limitless possibilities for human development, prosperity and over-abundance' (Perkovich 1999, 15). Matias Spektor notes a similar combination of horror and fascination in Brazil and Argentina. Nuclear science, he contends, was not considered a tool of national survival, per theories of deterrence, but part of the larger structures of modernity and colonialism (Spektor 2020, 164). Generally, science and technology have been central to anti- and postcolonial visions and movements, as Itty Abraham writes (2006, 211). Nationalist agendas after the Second World War were influenced by and articulated through discussions on science. Technical knowledge and expertise played a crucial role in mediating nuclear thought (Hecht 2011; Krige 2006). Discussions on the atomic bomb can accordingly be understood as a form of techno-politics, combining technical expertise and political power (Mitchell 2002, 42–43). Perceiving themselves as modern and nationalist subjects, intellectuals highlighted indigenous science and technology as key for their ability to deal with social and economic issues.

Colonialism, militarism, race

As the invention of the atomic bomb took place at the apex of anti-colonial activities around the world, it was intricately intertwined with nationalist sentiments, both in terms of the existential anxieties it posed (as this section discusses) and in terms of its potential (as I will later show). Interpretations of the bomb were influenced by the framework of de-colonisation, igniting debates about its incorporation within the arsenals of colonial powers, its role as a new manifestation of militarism, and the racialisation of its use against Japan, a non-Western power. Relics of some of these debates are still present today, in Egypt and beyond, in discussions on the double standards afflicting the nuclear non-proliferation regime, particularly vis-à-vis the Global South, theorised by scholars through concepts such as 'nuclear Orientalism' and 'techno-racism' (Gusterson 1999; Mathur 2018).

The atomic bomb was perceived as a tool of colonial power, sought as part of a quest for additional domination and oppression. It was still recognised as representing a qualitative shift within the tools of violence available to colonial powers, suggesting a new era in Western military superiority and dominance. Writing in 1951, the well-known Egyptian Islamist thinker Sayyid Qutb (1906–1966) depicted atomic bombs as part of a pattern of disturbing, deadly and diseased technology, highlighting the unknown and supernatural effects of the bomb, which were still the subject of speculation. The inclusion of the bomb within the available toolkit of colonial powers, he argued, put those in the de-colonising world at risk. Qutb is often seen as the face of violent Islamism for his articulations of jihadism in *Ma'alim fi al-Tariq (Milestones)* and was hanged after being accused of treason by the Egyptian government. In an article entitled '*Fi mafraq al-turuq*' ['At the Crossroads'], an excerpt from his lesser-known book *Al-Salam al-'Alami wal-Islam* (*Universal Peace and Islam*), he focused on the bi-polar world that emerged after the war and the uncertain position of Arabs and other people in the de-colonising world within this new order:

> If Hiroshima has become an example of [the detonation of] a small atomic bomb, we will be lab rats for [future] atomic experiments, hydrogen bombs, creeping death gas, magical death-inducing radiation, and the war of stray microbes, and other things generated by the mind of the infidel in the world of the polluted Western conscience (1951, 1135).

In Qutb's description, the bombings of Japan are a reminder of new technologies producing unprecedented and horrifying forms of lethality, and of how such technologies intertwine with imperialist power. Qutb suggested that people were becoming test subjects in a laboratory and was concerned with the mysterious effects of the 'atomic experiments', including radiation, which was not fully understood. Considering the secrecy surrounding the bomb, he imagined an infinite realm of possibilities created by a combination of new technologies and de-humanisation of certain groups of people. Hiroshima, in other words, was just the beginning. Thinking of the atomic bomb as the onset of a new technology of racialised colonial violence, Qutb imagined the future as containing new forms of cruelty against colonised people. While Qutb does not appear particularly enthusiastic about atomic science from a technological standpoint, his writing nonetheless demonstrates an awareness of the new, albeit scary, possibilities it contained. His anxieties regarding the nuclearised future were still deeply intertwined with technological fantasy, reflected in the array of new scientific developments he imagined in the passage above.

His text criticised both the capitalist and communist blocs and was concerned that their wars would afflict the lands and bodies of people in the de-colonising world – a reflection of an early moment in the development of Third World solidarity politics. Although Qutb invoked the 'mind of the infidel' as a danger, this was a political rather than a religious characterisation; it pertained specifically to the West. Furthermore, his reflections on colonialism and militarism explicitly drew upon the language of race, demonstrating that these processes and their effects on the Third World have always been intertwined with questions of race and dehumanisation. Indeed, in the same text, Qutb referred to the US harbouring 'enmity towards colored people' and proclaimed that the 'arrogance of the white man in America rivals even the [wildest] imaginations of Hitlerism' (1951, 1134).

In Qutb's writing, there is an underlying racialised imaginary influencing not only the development of new military technology but also its use. This was not an unusual perspective – lesser-known writers also analysed these global political transformations through a similar

lens (Zaytun 1950, 853–855). There were, however, varying degrees of critique; while most authors condemned the bombings, some – such as Qutb – went so far as to imply that it was a live experiment. The racialised view of the atomic bombings of Japan, as Matthew Jones (2010) has shown, was widespread in Asia and elsewhere across the Global South, and Egypt was no exception. This lens persisted and was even intensified during the Korean War, particularly following reports of the US contemplating using nuclear weapons against Korea. The decision to bomb Japan, and not Germany, was perceived by some Asian commentators as a reflection of the West's racist indifference to Japanese lives, among other factors (Jones 2010, 18–19). But one interpretation of the passage by Qutb above suggests that he took this further: if Hiroshima embodied racism towards Japanese people, then the future methods of violence that would be used to put down people in the Arab and Muslim world would be much worse, it implies, invoking a racialised hierarchy. He was anxious about a future containing virtually mythological technological possibilities that could be misused by colonial powers who dehumanised people in the Third World.

In the 1920s, Japan had been perceived as a role model for industrialisation, including by Qutb, who expressed respect for its ability to embrace material aspects of modernity while still preserving its indigenous culture (Gershoni and Jankowski 2009, 43). However, Japan's subsequent imperialistic aims became a subject of critique ('Anan 1945; Gershoni and Jankowski 2009, 43). As Israel Gershoni's revisionist work has demonstrated, Egyptian intellectuals were generally supportive of liberal democracy and took an active stance against imperialism and fascism in Europe and elsewhere (Gershoni 2014). In Qutb's text, for example, 'Hitlerism' is invoked as a metaphor of ultimate racism, immorality and cruelty. Nevertheless, in the eyes of many Egyptian intellectuals, this fact did not absolve the Allies of their embrace of an unprecedented form of military violence.

Writing only 11 days after the bomb was dropped on Hiroshima, surrealist artist Georges Henein (1914–1973) argued that the bombing reflected a 'prestige of terror' by the modern state. After the indiscriminate bombing of Hiroshima, he argued, the modern state had lost any claim to morality. In addition to being a leader within the Egyptian surrealist movement, Henein was engaged in anti-fascist and anti-imperialist activism as well as revolutionary Marxism. 'These perfected technologies, these supreme refinements in murder', he wrote, 'possessed nothing that could enhance the cause of freedom' (1945). Henein contended that by using the atomic bomb, the Allies had become no different than their enemies. Any claim to democracy was rendered void by the use of the bombs in Japan, which illustrated 'a penetration of Hitlerian political behavior into the ranks of democracy'. He similarly noted the racialised aspects of the bombing, mocking Western racism by asking rhetorically, 'What does the premeditated assassination of hundreds of thousands of Japanese civilians matter? Everyone knows that the Japanese are yellow, and, in addition to impudence, evil yellows' (1945). Although Henein and Qutb had vastly different political and ideological views and social backgrounds, they held comparable concerns over new directions in Western militarism. Qutb expressed these concerns predominantly through Islamist language and Henein through a Marxist lens, the two most prominent modes of dissent at the time in Egypt, but they both had existential anxieties over the emergence of a novel mode of warfare. They both experienced the bombing of Japan as an unsettling indication of the racialised violence practised by imperial powers.

Like many thinkers around the world during this time (Harrison 2013, 101), Egyptian authors routinely predicted a third world war involving atomic bombs, indicating that the

bomb was not seen as a tool of global stability or peace ('Akif 1950; Diab 1951). The bomb was discussed as an object inherently associated with colonial power, and this blatant disparity was invoked in various satirical commentaries that highlighted anxieties relating to decolonisation. Writing in *al-Ahram* in August 1945, Muhammad Tawfiq Diab (1886–1963), a journalist who was involved in anti-colonial activity, noted that this 'masterpiece of the universe' was a gift to great powers that precluded small- and medium-sized states (Diab 1945). Egyptian nuclearisation was explicitly mentioned only in a text by the prominent liberal writer 'Abbas al-'Aqqad (1889–1964), who imagined Egypt's possession of atomic bombs as a threat to expel the occupying British powers and gain sovereignty over its own territory (1950, 16–17). Notwithstanding these anxieties, many of the same thinkers also wrote enthusiastically about atomic science and technology, and I will later discuss 'Aqqad's imaginations of atomic energy creating a techno-utopia.

The importance of the overarching colonial framework for discussions on Hiroshima is discernible in the focus by intellectuals in Egypt on the West as one bloc, or even predominantly on the UK instead of the US, although it was the latter that had developed and dropped the bomb. While there were 17 British scientists involved in the Manhattan Project, the UK itself only became a nuclear weapon-possessing state in 1952; however, as the colonising power in Egypt and thus the focus of resistance, it received disproportionate attention. This focus on the UK instead of the US is especially prominent in earlier publications, although the US increasingly attracted attention and critique after 1950 due to its role in Korea. Such Egyptian preoccupation with the UK or the Western powers as a whole can be contrasted to a much more US-centric focus on the atomic bomb in China, for example, which was directly involved in fighting the US in Korea (Harrison 2013, 104). This demonstrates the limits of understanding the bombing as a universal event, indicating rather that the distinct dynamics of decolonisation shaped intellectuals' interpretations of this moment.

Science and the postcolonial nation

Qutb also referred to the bombings of Hiroshima and Nagasaki in his magnum opus *Fi Zilal al-Qur'an* (*In the Shade of the Qur'an*), a highly influential commentary on and exegesis of the Qur'an, which he mostly wrote while in prison. Discussing science in Islam, he wrote:

> Humanity has now reached an advanced level of science and [is even able to] split the atom and use it. But what has humanity benefited so far from this science, whose practitioners do not remember, fear, thank, or accept God? What have we achieved [so far from atomic science] except for the victims of the bombs of Hiroshima and Nagasaki? (1972, 2633–2634).

The problem with atomic science, according to Qutb, was that it had been disconnected from an overall moral guidance, encapsulated by the bombings of Hiroshima and Nagasaki. As the passage suggests, Qutb was not criticising the technology itself, which represented a positive achievement that could have aided human development, but rather its use in unethical ways.[2] Once again, this critique was not levelled only by Qutb or those in Islamist circles; rather, it was common among intellectuals from various political trajectories. Many were concerned that scientists had become complicit in the making of the modern machinery of warfare. Philosopher 'Uthman Amin (1905–1978) reminded his readers that 'correct science' was guided by a moral doctrine (1946). The view of science as neutral but subject

to perversion indicates that these individuals still had a minimal faith in, and admiration for, science and scientists. These discussions were part of a global conversation about ethics, science and war. As in India (Abraham 1998, 47), Egyptian and Arab intellectuals invoked the Janus-faced nature of atomic science, using it to exemplify the two paths of good and evil ('Akif 1950, 25; Haddad 1945, 1344–1345; Sha'at 1946; Shahin 1948, 174–175). They did not perceive a contradiction between their enthusiasm for atomic technology and their apprehension regarding its military applications and wartime use.

Unsurprisingly, scientists were more likely to defend the principle of a 'republic of science', in which the objective of science was to uncover the truth, rather than serve any state or military (Rotter 2008, 11–22). Already in 1945, 'Ali Mustafa Musharafa (1898–1950), a professor of theoretical physics, had published a book entitled *Al-zarra wal-qanabil al-zarriya* (*The Atom and Atomic Bombs*), a testament to how closely he was following these scientific developments. As the dean of the faculty of science at Fu'ad (later Cairo) University, he was the most prominent commentator on scientific matters in the public sphere, and he depicted the harvest of energy as a silver lining of the bombings:

> If atomic energy came to people in the form of a destructive bomb, this should not make us forget the economic and constructive purposes for which this energy can be used. […] And if we obtained this energy through the form of a massive explosion, it is because we wanted to obtain it in this form. We dedicated efforts and resources towards this purpose. […] Peace has arrived, and there is an urgent need for reconstruction rather than destruction. I do not doubt that efforts will be directed to the use of atomic energy as a mobilizing instrument in machinery (1945, 67–68).

Despite his declaration that peace had arrived, Musharafa subsequently underlined the importance of 'scientific and technical capacity' for political purposes. He reminded his readers that Italy had used chemical weapons in its invasion of Ethiopia (which had been extensively discussed and criticised in the Arab press), arguing that this had only happened because Ethiopia did not have the same scientific capacity (1945, 69). He highlighted this inequality to argue in favour of providing additional resources to, and of greater interest in, indigenous scientific knowledge. He contrasted Egypt's scientific capabilities with those of Western states – in terms of budgets dedicated to scientific research and in terms of units of energy utilised by individuals. Musaharafa's use of the term 'we' in the passage above suggests an appropriation of the atomic discovery; it reflects a sense that it belongs to humanity or to the scientific community. However, he also perceived Egypt's inferior position vis-à-vis Western powers to be disconcerting, not unlike Qutb. His text was attuned to the embeddedness of science within the global history of empire and seemed determined to challenge it. While Musharafa may have outwardly embraced discourses of a scientific republic, it is clear that he was concerned with national scientific hierarchies. His enthusiasm for atomic science made him nervous regarding Egypt's lack of scientific know-how and what this would mean for the country's future, particularly vis-à-vis colonising powers.

Musharafa took advantage of the public interest generated by the bombing of Japan to make a plea to Egyptian politicians regarding the importance of state investment in education aimed at boosting scientific consciousness. 'Science has become essential for the life of any nation', he declared, criticising the Egyptian political class's lack of interest in science. 'Do our politicians really think they can reach anywhere without science and its weapons?' he asked (1945, 69). The idea that a scientific awakening was necessary for

national progress was hardly new (Elshakry 2013, 223), but the focus on indigenous science reflected the nationalist landscape. Musharafa lamented Egypt's alienation from science, declaring,

> We […] transport the knowledge of others then, in general, we leave it without a connection to our past and no contact to our land: it is a strange, foreign commodity in its features, and strange in its terminology, and strange in its conceptions (Rashed 2008, 535).

As part of his bid to nationalise atomic science, Musharafa called for Egypt to search for uranium in its deserts. He emphasised science as a strategic asset for a nation striving towards progress and independence – a view that ultimately became a cornerstone of the developmental agendas of many postcolonial states. Focusing on and investing in national scientific capability was, for Musharafa, key to the process of decolonisation. This once again reflects the ways in which the atomic bomb generated a combination of excitement and unease.

Scientific knowledge was perceived as a catalyst of social change, and within elite aspirations of postcolonial modernity, the role of science in the future nation was a subject of continuous deliberation. There was a consensus that scientific contributions could define the nation's overall status – and atomic science was seen as an especially promising field at the time. In India, nuclear technology was framed as a way to transcend the 'lag' imposed by the colonial past (Krige 2010, 152). In newly independent Pakistan, similarly, scientists voiced concerns about the neglect of science and its potential for building – and defending – the nation. As Zia Mian writes, 'Embracing this [atomic] future offered a way to affirm a shared perspective on what it meant to be a modern state and society in the contemporary world and what the future would be like' (2009, 32). Furthermore, as Matias Spektor argues regarding Brazil and Argentina, 'Acquisition of nuclear-related know-how became part of a broader developmental enterprise that went beyond nuclear power itself' (2020, 167). Anti- and postcolonial movements adopted such technological-modernist ideas, which would subsequently become the main indicators of development and progress under what Bentley B. Allan (2018) describes as a scientific cosmology that operates under the tutelage of international organisations. Interacting with global capitalism and nationalism, this techno-politics filled a 'discursive vacuum' in the foundations of the postcolonial state and was seen as 'authenticating' the nation (Abraham 1998, 18, 9). As Itty Abraham summarises:

> Postcolonial science can never be only about science. Science helped bring the nation under colonialism into being; now, it is central to the forging of the postcolonial state. Science exists simultaneously as history, as myth, as political slogan, as social category, as technology, as military institution, as modern western knowledge, and, as instrument of change (2006, 213).

Notwithstanding debates on their complicity in war, scientists were perceived as both nationalist subjects and architects of sovereign modernity, ultimately paving the way for the securitisation of science and the formulation of the national security state. The making of science as an indigenous endeavour of national self-strengthening was, as Abraham asserts, inextricably intertwined with the process of de-colonisation. In Egypt, multiple scientists reflecting on the meanings of Hiroshima and Nagasaki shared Musharafa's plea. For example, 'Akif contrasted the US's financial investment in the Manhattan Project with Egypt's modest expenditure on scientific research (1945, 2). Similarly, science writer Muhammad 'Atif Al-Barquqi concluded that the bomb should serve as a reminder to Egyptians of the importance of scientific research, including the 'hidden wealth' lying beneath it (1945, 473).[3]

Techno-utopia

This promise of atomic technology – crystallising after the bombings of Japan – is a well-documented phenomenon (Boyer 1985). The association of atomic science with prospects of prosperity through technology and energy was deliberately emphasised in statements about the bomb by US officials and allies (Kirstein 2009) and was later institutionalised in US foreign policy through programmes such as Atoms for Peace (Krige 2010, 157). Hiroshima was seen as introducing a new era of science, and, like elsewhere in the Global South, Egyptian thinkers across different political orientations focused on the technological and economic dimensions of atomic technology to articulate a postcolonial modernity (Abraham 1998, 6; Mian 2009; Perkovich 1999, 17; Spektor 2020).

Already on 13 August 1945, *Al-Ahram* was referring to the commercial usage of atomic science, while numerous pseudo-scientific and speculative materials emerged during this period discussing atomic technology's potential (Al-Salim 1945; Al-Shitwi 1946). In line with a global discourse, intellectuals in Egypt embraced fantasies of a techno-utopia during this period, using it to project their own political agendas. These imagined futures were not discussed within the context of an emerging national nuclear programme, or an ideology diffused by the state in a top-down manner. Crucially, they did not necessarily contradict sharp critiques of the bombings; rather, these often overlapped.

Based on the idea of limitless energy, thinkers imagined a utopia through their disparate political ideologies. As mentioned, Marxism had grown in popularity in the 1940s, leading to deliberations about how it could be reconciled with ideas of limitless atomic energy. 'Aqqad, for instance, argued that abundant atomic energy would ultimately shatter Marxist thought, as industry would no longer be dependent on exploiting labour (Al-'Aqqad 1945, 885). As a staunch defender of liberal thought, he perceived Marxism as contradictory to democracy and therefore argued that the bomb would serve democratic freedom. In an otherwise celebratory commentary, he declared that the bombing was not, contrary to its depiction, 'a matter of life and death for the Allies', who had already won the war. Yet the bulk of the article expressed enthusiasm for atomic energy, even suggesting that it would bring an end to colonialism, which he argued arose from the need for raw materials and new markets. 'Akif similarly envisioned cheap and abundant atomic energy as ending colonial domination and resource extraction (1950, 23).

Atomic energy, still an abstract idea at this point, functioned as a blank slate upon which intellectuals imagined alternative futures, a condition reflecting the early period in which nuclear categories were being made and contested. These romantic portrayals of the potential of the atomic bomb to create a techno-utopia would later become confined to the realm of science fiction.[4] In this early stage, Hiroshima came to symbolise and stand for various elements of modern life, playing a semiotic role in imaginations of alternative futures. The imaginations of a techno-utopia did not mean that intellectuals overlooked the colonial-militarist etymology of the bomb, but rather that prosperity and destruction were part of the same thread, with fantasies of progress taking place alongside threats and anxieties regarding colonial violence. The technological euphoria of these early days was global, but it was expressed in local contexts through different idioms and metaphors. In Egyptian representations, the bomb was frequently expressed through the symbol of an egg (Al-'Aqqad 1950, 14; Al-Barquqi 1945, 470; Al-Shitwi 1945, 902). For instance, science writer and translator Fawzi Al-Shitwi declared:

> We cannot speculate regarding what scientists discovered […] that led them to the atomic bomb. But […] it opened vast horizons of science and paved the way for the discovery of the atomic bomb. It is very reasonable that its size does not exceed the size of an egg and is capable of destroying several miles of the Earth's surface (1945, 902).

The text highlighted the conflicted emergence of atomic science, acknowledged as being highly destructive to Earth but also opening up the horizons of science into new and possibly emancipatory directions. The article began with the question, '[Is the atom] for the destruction of the world or its construction?', which framed the discussion. Al-Shitwi was the scientific editor for *Al-Ahram* and published a recurring column in *Al-Risala* on atomic science in the first half of 1946.

The representation of the bomb as an egg can be compared to its description by Albert Camus as being the size of a football (Combat 1945). Although both metaphors – the egg and the football – do not reflect the bomb's actual size, which was much larger, they underscore the ways in which it embodies a concentration of destructive power. They highlight how a tiny object can cause widespread and unimaginable damage. However, the symbol of the egg also evokes a metaphor of life within the bomb, which aligns with the portrayal of the nuclear age as both a rupture and a rebirth and of atomic science and technology as a new beginning, a symbol of a postcolonial imaginary.

As Ran Zwigenberg argues, the bombing and destruction of Hiroshima was immediately perceived in Japan through an emphasis on 'transformation, rebirth, and ultimately progress', a process he attributes to elites in both the East and the West who sought to reaffirm the processes of modernity and science in the post-war era (2014, 24). In fact, Hiromi Mizuno asserts that the status of science and technology in Japan was unscathed by the atomic bombings; if anything, science was promoted more vigorously (2008, 173). This indicates, as Harrison reminds us while discussing responses to Hiroshima in China, that reactions to the bombings were not 'natural' but rather mediated by both national and transnational forces (2013, 116). Not only was some information patently false, but it also deliberately silenced some voices, such as the stories of survivors. Censorship by the US military ensured that there were no visual disseminations of human suffering from the effects of the bomb in the early period. This meant that the effects of the bomb continued to be a subject of speculation even in the early 1950s (Lindee 1994).

Conclusion

The debates described in this article had far-reaching implications for subsequent political developments. Critique of nuclearisation, for example, was channelled into support for the Peace Partisans movement in the 1950s, which obtained thousands of signatures from influential Egyptian political and cultural figures (Cormack 2021, 307–308; Ginat 2021, 716).[5] Meanwhile, the enthusiasm for atomic technology was put into practice in the postcolonial period, leading to Egypt's decision to launch a nuclear programme in 1954. Egyptian president Gamal 'Abd Al-Nasser was reportedly enamoured by the potential of atomic technology; according to Rublee, this excitement intensified when an Egyptian singer – presumably national icon Umm Kulthum – was treated with radiation therapy in the US (2009, 107). In 1957, two years after the establishment of the Egyptian Atomic Energy Commission, Nasser

highlighted plans to develop an atomic reactor and a nuclear physics laboratory, and emphasised that 100 Egyptian scientists had specialised in atomic research that year alone (Al-Ahram 1957; Caruthers 1957). By 1958, Egypt was building its first research reactor at Inshas (60 km east of Cairo), acquired with Soviet assistance.

Military applications were not the main purpose behind these endeavours, and in fact, they were only seriously considered in the 1960s after the Egyptian leadership learned about the Israeli nuclear programme at Dimona (Rublee 2009, 109; Shikaki 1985, 83–84). This shift can also be attributed to the consolidation of a global nuclear order and discourse emphasising nuclear desire and deterrence, which concurrently influenced imagined futures. Before these paradigms became dominant, during the ephemeral period when nuclear imaginaries were still in flux, the bomb was not seen as intrinsically desirable – the desire was for technology and science. Egyptian officials were initially interested in nuclear science for national development, in line with the trends and outlooks described above. The direction of Egyptian nuclear policy after independence does not indicate a causal relationship with the material presented here, but it highlights the importance of considering how intellectual reflections and discussions structure political debates.

Furthermore, this research demonstrates that nuclear decision-making is not only a product of the top-level political or military leadership; rather, the nuclear condition is produced in a multi-faceted and multi-directional manner, including through imaginations of the future. By capturing the discursive role of the atom in the imaginations of intellectuals in Egypt, the article has shown that critical reflections on the bomb were comfortably situated alongside nationalist perspectives on science, and even alongside fantasies of techno-utopia. Egyptian thinkers were critical of the new order introduced by the bombings of Japan, which they perceived as advancing colonial power and Western racial hierarchies. From their perspective, the atomic age appeared to signal the dawn of a new and unsettling era. At the same time, atomic science reflected exciting potential, particularly for the emerging post-colonial state. It was invoked alongside a broader endorsement of the authority of science and technology, particularly their implications for political liberation and national development. Imaginations of abundant energy in the atomic future enabled authors to envision and describe futuristic societies. The conversations described throughout this article show how authors articulated their relationship with the nation and its future through fantasies of atomic technology's emancipatory potential as well as anxieties about colonial violence. Rather than perceiving the two as inconsistent, I have argued that these two frames were reconcilable and can be understood as representing a nuanced Arab engagement with the nuclear condition.

The article contains several implications for scholars working on nuclear history and politics. First, it serves as a reminder that there were critical debates about the nuclear condition taking place in the Middle East. The reactions of Egyptian intellectuals were informed by global debates, but they were not merely memetic. Rather, they highlighted local political concerns in the pivotal moment of de-colonisation, in which the future was being radically reimagined. Despite the duality that accompanied the atomic age, intellectuals did not adopt binary positions on the atomic age but developed more complex positions on how it would change the world. While Egyptian nuclear history has often been discussed through the two opposing poles of nuclear proliferation versus nuclear restraint, this article highlights a more dynamic engagement with the bomb.

Furthermore, by studying this moment, we can historicise and complicate the structures of the global nuclear order. The established categories and concepts for talking about nuclear weapons were not self-evident and have not been static since 1945. Contrary to a linear trajectory in which the bombing of Japan is seen as creating the dominant concepts and categories that resulted in the current nuclear non-proliferation regime, the article gives space to different meanings and interpretations of the atomic age. In doing so, it aims to challenge the 'entrenched, rigid meanings assigned to, or embodied by, nuclear weapons', in the words of Ritchie (2013, 165). I have identified early processes of nuclear meaning-making, such as the atomic bomb as a new part of the colonial toolkit and as a form of racialised violence, atomic science as a key to modernity and to postcolonial national development, and atomic energy as a way to project utopic fantasies. Not only do these processes merit scholarly attention to obtain a fuller picture of Arab nuclear thought, but they can also enable us to reconsider the dominance of concepts such as deterrence and proliferation in nuclear politics (see Pelopidas 2011).

Finally, the emergence of thought on the nuclear condition in Egypt was informed by the overarching process and project of de-colonisation, which fundamentally shaped the reactions described above. Yet, thus far, the atomic age and decolonisation have largely been studied separately. Exploring the different responses to nuclear weapons at this critical juncture can allow us to better contextualise the subsequent emergence of national nuclear programmes, whether for research, energy or weapons. Understanding the overlap between the atomic age and de-colonisation will enable a nuanced understanding and scoping of non-Western nuclear thought.

Acknowledgements

I thank the editors and anonymous reviewers for their helpful suggestions on earlier drafts of the manuscript. I am grateful to Benoît Pelopidas, Pelle Valentin Olsen and Kjølv Egeland for their intellectual input. Hassan Elbahtimy's involvement in the earlier stages of this work was extremely valuable. This work was presented in a seminar hosted by Nuclear Knowledges in Paris in 2018 and a workshop at the University of Stockholm in 2019, and I am grateful to the participants for their feedback.

Disclosure statement

No potential conflict of conflict was reported by the author.

Funding

This work was supported by the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (Grant agreement No. 759707).

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Notes

1. All translations from Arabic were carried out by the author.
2. Contrary to earlier thinkers, Qutb did not try to reconcile Islam with science, arguing that science and technology must be subsumed within an agenda of religious rejuvenation. He perceived scientific knowledge as tenuous and imperfect, as opposed to religious text (Elshakry 2013, 316).
3. Taha Hussein, the quintessential Egyptian literary authority, shared this view. He saw the nuclear age as potentially 'elevating financial life, and elevating moral life, through enabling the spread of justice and satisfaction' (1946, 15).
4. For example, a 1967 novel by Muhammad Mahmud, *Man Below Zero*, is premised on nuclear explosions destroying Earth, followed by a socialist utopia driven by nuclear energy. Nuclear energy is described as a 'bomb of happiness' (Campbell 2018, 165–167).
5. As a Soviet-backed movement, the Partisans of Peace was often perceived as communist propaganda, although the participants were genuinely concerned about nuclear weapons; these concerns, however, became interwoven with other political demands (Cormack 2021, 307–308).

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