Aswan High Dam: Ransoming Egyptian Independence

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Introduction

> The Dam is no more a fantasy
> But an unprecedented fact.
> I gaze with overwhelming joy
> At an all-enlightening future
> With flourishing factories,
> And the colour of green covering the arid land.
> Life of tranquility in abundance for all people
> And a pleasant journey to the top. --Umm Kulthum[1]

In May 1964, Gamal Abdel Nasser officially embarked upon construction of a dam that would liberate Egypt through larger water storage for agricultural, culinary and commercial use. For nearly a decade, the Revolutionary Command Council, followed by the military leadership of the U.A.R., promised that the Aswan High Dam (AHD), as Kulthum sung, would revolutionize work and life in Egypt by permanently freeing citizens from colonialism through acceleration of industrialism from hydro-power, enhancement of food productivity to alleviate starvation with year-round irrigation and storage during drought. With the installation of one technological device, the AHD could accelerate the goals of 1952 Free Officers Movement and, perhaps, even obliterate the continual disadvantages of building a postcolonial nation state. Despite these promises, Egypt in 2017 finds itself trapped in a cycle of dependence on former colonial powers for economic investment, agricultural aide and water infrastructure grants or technology. Furthermore, the AHD wrecked the ecological health of the river and, in turn, the livelihoods of small farmers and fishers. In the shadow of a project that promised so much, has it made citizens less independent and the country less democratic? How can multiple-peer reviewed studies on negative ecological effects of the dam from nutrient loss to erosion to high water tables and salinization of soils be ignored? How can the Egyptian government continue to pursue reclamation projects in the desert after so many decades demonstrate that such projects fail? Has the dam become an inseparable part of Egyptian citizenship and identity?

The AHD was more than mechanical device crammed into a river in order to provide nearly limitless water for year-round crop production and hydropower. The dam was an infrastructure machine hardwired to specific ideas about how to organize a country politically, economically and agriculturally which in turn required a specific type of expert management bound within the ideology of high modernism. This “Rule of Experts,” as Timothy Mitchell calls them, was a techno-

[1] Avinoam Shalem, “Man’s Conquest of Nature: Al-Gazzar, Sartre and Nasser’s Great Aswan Dam.” *Journal of Contemporary African Art*, Issue 32 (March 2013): 24

political promise to solve the legacy of postcolonial socio-economic problems in rapid way at the expense of a longer and messier democratic debate.[2] Supporting and selling the dam required burying the potential problems, both ecological or social during and after its construction, while touting its line-by-line economic promises in a far distant future. Ultimately, the AHD was an inherently authoritarian method of radically defining citizenship within modern Egypt while jettisoning an organic democratic structure because its goals, from controlling the river at one focal point to simplifying agriculture on an industrial scale to transporting citizens from farms to cities to an obsession with the future at the expense of the present, forced Egyptians to abandon their traditions about water practices and farming as well as the possibility of a more plural post-revolution to match the demands of the dam.

Part I. Egyptian High Modernism

High modernism was the ideology that built the dam that Egypt finally commissioned in September of 1970. Before we can explore the Revolutionary Command Council's decisions to pursue dam construction, we need to define high modernism and explain how the Free Officers Movement envisioned it. I used James C. Scott's entrancing *Seeing Like the State* to define this ideology. This was a historical process generated in the West as a repercussion of monumental scientific and industrial progress in the 19th and early 20th centuries: "It is best conceived as a strong, on might even say muscle-bound, version of the self-confidence about scientific and technical progress, the expansion of production, the growing satisfaction of human needs, the mastery of nature…above all, the rational design of social order commensurate with the scientific understanding of natural laws."[3] It organized the natural world and society in a simplified way that homogenized difference in order to maximize value and exchange. This was displayed in its insistence on growing monocrops, eschewing ecological diversity, insisting that farming become industrialized under state control to maximize foodstuffs, straightening rivers to streamline water movement, organizing cities to accelerate worker commutes from home to the factory or simply eschewing tradition in favor of newness. Its practitioners constructed it as a scientific practice when it was, in fact, an ideology fixated on using the state, both left and right varieties, to carry out large-scale utopian changes to the lives and work of citizens.[4]

At its heart, high modernism offered immediate and radical technocratic solutions to murky social and political problems because it rested on three components. First, its practitioners aspired to organize nature and society under an administrative block of high level experts.[5] Developing in a period where scientific and industrial education or experience was limited by class and race, high modernism began from position that only a select few could understand and conduct it. Studying theories, collecting data and implementing technical solutions required an elite education that couldn't be found in the lives of rank-n-file citizens.[6]

Second, in order to achieve these goals, it relied upon "unrestrained use of the power of the modern state as an instrument."[7] By placing itself in the hands of techno-experts, high modernism argued that its methods were superior to tradition. Tradition was a slow moving,

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[2] Timothy Mitchell, *The Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002), 15.

[3] James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998), 4.

[4] Ibid., 4-5 and 87.

[5] Ibid., 88.

[6] Ibid., 91-2.

[7] Ibid., 88-9.

borderless, often beyond institutions and generated from disagreement and conflict over time rather than the harmonious product of scientific reasoning and building through state experts. Modernism could, and often did, establish the history of a country as the first day of the modernist revolution rather than in some primordial or tribal pre-history. The industrial and scientific treatment of time in regards to the state kept the modernist state obsessed with the future. As the state depended on calculations for individual and social change through data-driven changes to the economy and natural world, it could predict the outcome of progress into the future. In its futurism, the state willingly made citizens accept the painful short-term sacrifices of multi-year plans.[8]

Third, high modernism was most applied and most successful, at least to those who faithfully believed in it, in countries where war, economic collapse or national liberation was underway and civil society does not possess the strength to resist high modernist leadership. These crises typically require an overthrow of the existing regime and installation of a new power with executive powers. With a long history of exploitation and stagnation, citizens often mandate these changes as "millennial expectations commonly associated with revolutionary movements give further impetus to high-modernist ambitions."[9]

Gamal Abdul Nasser had already embraced high modernism by the time of the Free Officer Movement in July of 1952. In his short primer, *Egypt's Liberation: The Philosophy of the Revolution,* Nasser used similar modernist terminology and views to the ones described by Scott. First, Nasser admitted and supported the view that the military was the only reliable set of techno-experts as a single "force set in one cohesive framework, far removed from the conflict between individuals and classes" and yet "drawn from the heart of the people."[10] There are no calls for direct democracy by the revolution: "Every idea we listened to was nothing but an attack on some other idea. If we had gone along with everything we heard, we would have killed off all the people and torn down every idea."[11] Instead, Nasser argues that the burdens of decision making must be placed on the RCC for their military and intellectual expertise, many were professors, and duty to the state.[12] There is no alternative viewpoint in civil society or at least what few Nasser finds there are divided, "We needed order, we found nothing behind us but chaos. We needed unity, but we found nothing behind us but dissension...It was from these facts, and no others, that the revolution coined its slogan."[13]

After establishing who would guide and manage the revolution, he emphasized a second point aligned within high modernism, revolutionary change could only happen with the confines homogeneity as dictated by the state. He argued:

> To be successful, the political revolution must unite all elements of the nation, build them solidly together and instill in them the spirit of self-sacrifice for the sake of the whole country. But one of the primary features of social revolution is that it shakes values and loosens principles, and sets the citizenry, as individuals and classes, to fighting each other…One revolution makes it obligatory that we unite and love on another…[14]

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[8] Ibid., 93-5.
[9] Ibid., 5 and 97.
[10] Gamal Abdul Nasser, *Egypt's Liberation: The Philosophy of the Revolution*, (Washington D.C.: Public Affairs Press, 1952), 42.
[11] Ibid., 34-5.
[12] Ibid., 31 and 39.
[13] Ibid., 34.
[14] Ibid., 40-1.

As much as this will be an egalitarian society without class, it is also a society free of conflict because individualism is turned down and put to assembly line work building the revolution. This additionally reinforced the rule of experts and planted whatever future would be built against the past and the traditions of Egypt. Nasser looked forward because he thought Egypt's past offered nothing practical, "our own country, is conditioned by the interaction of time and place…In simpler terms, we cannot go back to the tenth century; we cannot wear its clothes…we cannot become lost in its thoughts, which now appear to us as layers of darkness without any ray of light…Time, therefore, imposes its developments upon us…."[15] Whatever Egypt was about to become, Nasser placed it in the modernist future, not the past or the present. By doing this, he cut out democratic debate, pluralism and integration of older customs. In this section, he scolded the Egyptian who might look back for answers. "We cannot," limited the choices to the post-revolution and time, now turned into a colonizer itself, forced modernity on the country. Some of his doubts no doubt came from foreign policy concerns about the fragile revolution being attacked by colonial powers but on another level the modernism demanded rushing forward with only one plan to resolve social disorder.

In this tract, Nasser focused on the horrific legacy of colonialism not simply on its own terms but how it had hindered the progress, in western terms, of Egypt. This emphasized a third high modernist point, that modernism from the west was the only way to escape this colonial past. In a key section of the primer, Nasser examines the experience of colonialism in this lens:

> I used to complain that the people did not know what they wanted and could not agree on any program to be followed. Then I realized that I was demanding the impossible and that I had disregarded the circumstances of our society.
>
> We live in a society that has not yet taken form. It is still fluid and agitated and has not yet settled down or taken a stabilized shape. It is in the process of an evolution, striving to catch up with those other nations that have preceded us on the road.[16]

It's clear that Nasser did not view Egypt on its own terms. He compared and contrasted it, unfairly, to the west. There appears to be a kernel of self-doubt in his first remarks about his own countrymen. Was the process of not knowing "what they wanted" or not agreeing "on any program to be followed" a natural democratic process? He presses against this lack of "stabilized shape" with an internalized orientalism contending that "waves of thoughts and ideas came over us while we were not yet developed enough to evaluate them. We were still living mentally in the captivity of the 13th century."[17] For Nasser, Egyptians were incapable of making their own decisions and in need of an ideology that could make them agree on one program.

As evidence from this short book published in 1955, Nasser spoke for the Free Officers. While not using the term specifically, they had generated their own version of high modernism as a prescription to the ills befalling the state of Egypt. At once, this clearly demonstrates the difficulty in finding anyone, let alone a postcolonial revolutionary, who was not influenced by high modernism in the mid-20th century. Modernism promised to obliterate socio-economic problems along short time lines. Nasser argued that Egypt's colonial experience justified using it by speeding up the development of the country to feed, house, employ and educate citizens. This cut out other options, debates and futures for the revolution. Yet connected to my argument, this work also

[15] Ibid., 83.
[16] Ibid., 68.
[17] Ibid., 67.

demonstrates how building the High Aswan Dam, as a component of building the new state, was a product of that state centralized vision.

Part II. Building Dams and Building Citizens

The Nile River, like all dynamic water systems, would always resist the management practices of Egyptian modernism. It defined its healthiest state as chaotic and replenishing from long-term geological and biochemical processes across multiple states and ecosystems. Ancient volcanoes in Ethiopia are smashed with monsoons that wash dark alluvium silts down into the Blue Nile while the White Nile gathers other organic matter as it passes through swamps in Sudan after which both rivers combine, travel downstream and jump the river banks, flooding the land with the silt and fertile organic matter every July and August. This process also flushes out salt build up from the soil after it has dried to the surface over the year, dragging it off the topsoil and into the ocean.[18]

Wherever humans interact with water, they inevitably end up creating it by controlling or manipulating its natural character. Even in ancient Egypt, as population growth increased and crop production intensified, the river was not allowed to behave unimpeded. They built dikes, dug canals and manufactured irrigation tools to expand the growing season but water was equally obtainable along many different points and large diversions were avoided or technologically impossible. Both farmers and the state coexisted with the dynamic structure of the river and treated it as biotic for centuries, limiting most crop growth to the flood season.[19] The older organization of water did not simplify the natural world even as it tried to control "channeling floodwaters in sequence into hundreds of interconnected field basins, holding them for a certain period, and releasing them in sequence again was into the river a more complex irrigation mechanism" the dams that would replace it attempted to clean this slate and rewrite the manufacturing of water.[20]

The shift in making Nile water behave differently came through the colonial period. The Ottoman Empire brought weir and barrage construction to the Nile in the late 19th century and began year-round agriculture. After it lost Egypt, the British built the first Aswan dam and raised its level twice in order to expand year-round agriculture of cotton for export to textile factories in England.[21] While these projects were themselves modernist and adopted by Egyptians, the RCC moved dam construction on par with pyramid building, "'In antiquity we built pyramids for the dead. Now we build pyramids for the living.'"[22]

In several primary sources during the dam construction and its completion, the RCC and then the U.A.R. demonstrated how the dam was a cornerstone for building the Egyptian state and martialing the creation of new citizens. Within two months of taking power, the RCC leaders Samir Hilmy and Mahmud Yunis, both discussed the construction of a mega-dam with Adrien Daninos, a Greco-Egyptian engineer and self-described modernist who had been advocating hydropower since 1912. With a new regime in place and staffed with military engineers like Hilmy and Yunis, Daninos' concept received a second life. The two officers had the project for hydro-electrifying the existing Aswan dam examined by Dr. Muhammad Ahmad Selim, a hydrologist at Cairo University.

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[18] Daniel Hillel, *Rivers of Eden* (New York: Oxford University Press, 1994), 13-14 and 59.
[19] Daniel Hillel, *Out of the Earth: Civilization and the Life of the Soil* (New York: The Free Press, 1991), 91-3
[20] Mitchell, 35.
[21] Hillel, *Rivers of Eden*, 120-2.
[22] President Nasser in Jessica Barnes, *Cultivating the Nile: The Everyday Politics of Water in Egypt* (Durham: Duke University Press, 2014), 157.

By September of 1952, Dr. Selim's positive reports allowed the RCC to unanimously approve planning and funding for the project. There were no public hearings, no discussions with farmers, fishermen or river tradesmen and what little debate occurred within the Ministry of Public Works squashed studies that pointed out the potential problems of this size and type of dam. The military command were the experts. For the next eight years, the government tenaciously sought foreign funds to pursue the project and began charting its specific uses.[23]

Fundamentally, they believed the dam, not necessarily Egyptian citizens, would bring about economic independence through industrial agriculture and public sector growth. By storing a large amount of water for year-round for perennial crop irrigation on existing lands (which would allow Egyptians to grow more and earn more), flood control, new farms through land reclamation and industrial use. Old farm lands would be planted, watered and harvested with a higher intensity and this would earn farmers more money while providing more food to the state. When yearly supplies of plentiful water were combined with cooperatives handing out seed, fertilizer and pesticide, this would neatly produce greater yields. State planners predicted the public sector and civil service would grow by 20-36 percent after these harvests. Other plans argued that hydro-electrification would also provide enough power to fuel industrialism.[24]

When trucks finally dumped rocks into the river in 1964, Nasser could argue what the dam would do for and *to* its citizens:

> Here are joined the political, social, national, and military battles of the Egyptian people, welded together like the gigantic mass of rock that has blocked the course of the ancient Nile. Its waters now spill into the largest lake ever shaped by human kind and which will be an everlasting source of prosperity. (May 14, 1964)[25]

The importance of this quote is that the vision of the state by 1964 stood on the dam itself. Nasser intentionally mixes all the countries socio-economic problems and foreign policy battles into the concrete barrier bracing in the Nile. This is classic techno-politics. Complexity is turned into simplicity and divisions are cemented into one unified block. Modernism symbolizes in this speech by the way it "blocked" something "ancient." Whatever the past river's behavior, and that behavior was always loosely tied to definitions of being Egyptian, it has been held back because of the dam to make way for something new below it. Furthermore, the "everlasting source of prosperity" is located in the captured water held behind the dam rather than the Nile River itself or the citizens of Egypt.

Day-to-day state propaganda of the dam and responses by Egyptians promised more than water and crops for Egyptians. Two starting texts laying out grander visions were a pair of stamps issued in January of 1960:

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[23] Waterbury, *Hydropolitics of the Nile Valley* (Syracuse: Syracuse University Press, 1979), 99-102.
[24] Waterbury, *Hydropolitics of the Nile Valley*, 98-99. John Waterbury, *The Egypt of Nasser and Sadat: The Political Economy of Two Regimes* (Princeton: Princeton University Press, 1983), 87. Hesham Abd-El Monsef, Scot E. Smith and Kamal Darwish, "Impacts of the Aswan High Dam After 50 Years," *Water Resource Management* 29 (2015): 1875.
[25] Waterbury, *Hydropolitics of the Nile Valley*, 98 and 109.

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The creators of these 10m and 35m stamps made them recruitment posters to support the dam but also put the state directly at the center of the project. All of the expanded benefits are located in the future, from land expansion to irrigation to power are not coming multiple sources, and in one key place on the river, owned by the state. The writers use the phrase "ASWAN HIGH DAM MEANS" as if it is foreign idea the audience needs interpretation of. What does this project translate to? What is behind it? Only the state expert can accumulate and translate this data to the citizen. Then the unquestioned automatic benefits are listed. Interestingly, there are no citizens in the picture, just infrastructure holding back the natural world and making it placid. It is overseen by the state with "UAR" looming over the image promising completion at some distant date in the 1970s.

In a 1967 United Arab Republic pamphlet, *The High Dam*, the spirt of modernism pours out. One section insists that the dam is more than a water storage unit, "The High Dam's major value lies in that it represents the determination and free will of a nation, looking forward in pride and dignity and insisting on translating into practical action the aspiration of the people for a better standard of living."[27] Similar to the dedication speech by Nasser in 1964, the dam is more than a symbol of state objectives, it martials citizens to have "determination" and exercises their "free will." Again, the writers' diction shows that the dam is driving the definition and behavior of citizenship. It forces them to look forward and upward to the economic changes it will bring. To finalize the pamphlet, the writers return to the idea that the dam is the only machine capable of

[26] "My Dam Stamps" (stamps), accessed October, 5 2015, http://www.stampcommunity.org/topic.asp?TOPIC_ID=21925&whichpage=6
[27] U.A.R. Information Administration, *The High Dam* (Cairo: UAR, 1967), 3.

building a post-colonial state: "The dream which has long been cherished by all Egyptians is now being realized at Aswan."[28]

The pamphlet establishes AHD in a similar schema that Nasser used in *Egypt's Liberation* by comparing it to other modernist infrastructure in the west. "The quantities of iron and steel required for the construction of the [dam]….will amount to 140 thousand tons or about 20 times the quantity of steel work in the Eiffel Tower in Paris…The total quantity of water stored is estimated at 157 billion cubic meters or about 6 ½ times the capacity of the Hoover Dam in America," the writers declare[29] While these statistics indicate the immensity of the project, they also place the dam, that is the country of Egypt after the revolution, within the modern world. On top of these competitive claims that fit back into Nasser's views, the dam is also separated from the ancient Egyptian monuments: "the total quantities of the various materials for the construction of the dam…are estimated at 43 million cubic meters, enough to build 17 pyramids the size of Cheop's great monuments at Giza."[30] Once more, the statistics establish how large the project is physically with specific volume data which can only be accounted through experts but this claim also supports the idea that modernism is beyond the scope of those traditions. Journalists at the time even claimed that the dam would be "'the physical starting-point of a new Egypt.'"[31]

By the mid-1960s, the modernist promises of the dam became a panacea for all political and economic dilemmas the country faced. During Nasser's run for sole candidate as president in January 1965, a crowd outside parliament chanted: "Nasser, Nasser, we come to salute you; after the Dam our land will be paradise…"[32] The Egyptian writer Safynaz Kazem described this futurist obsession while the dam was under construction and the state drifted towards authoritarianism: "To the people's demands, the answer was always 'After the Aswan Dam, wealth will flood the nation.' 'After the dam, there will be electricity everywhere.' Always, 'after the dam.' To the point where we thought it would work marvels."[33] One of the few scientific critics of the project during the 1950s was Ali Fathy, chief supervisor of the Old Aswan reservoir and professor of irrigation at Alexandria University. He lamented this futurist outlook at the time:

> It became clear that competent technicians in government circles were collectively determined to overlook any signs of the deterioration of soil fertility as side effect of the High Dam, even as a hypothesis. This was the result of what might be called the "the High Dam Covenant," a psychological state born of political and other circumstances which has cloaked the project from its very inception.[34]

The modern project, as these texts make clear, places water at a single access point governed by the state. While there is still some agency for farmers in the field choosing how much water to apply to crops, to the foreman at a small manufacturing plant in Cairo or the housemaker doing dishes, the dam, which is always an extension of the state, allows this access to water rather than individual efforts or localized networks. [35] This was a continuation of the water-making practices from the colonial period but with the explicit goal of building new citizens. In a positive

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[28] Ibid., 3.
[29] Ibid., 3-5.
[30] Ibid, 16.
[31] Nancy Y. Reynolds, "City of the High Dam: Aswan and the Promise of Postcolonialism in Egypt" *City & Society* 29, no.1 (2017): 215.
[32] Waterbury, *Hydropolitics of the Nile Valley*, 116.
[33] Reynolds, 215.
[34] Waterbury, *Hyrdropolitics of the Nile Valley*, 116.
[35] Barnes, 158.

feedback loop, the state promised the dam would provide a way out from postcolonialism if the citizens supported it; to sell the physical sacrifices and large capital investments (indebting the country to western countries and influence) necessary to build the dam, the state experts calculated its future benefits by simplifying the hydrology of the river, industrial agriculture and hydropower; and the Egyptian citizen could only participate in this new future if he or she supported, collectively, the efforts of the state and protected the dam. Perhaps this explains why no one in one of the few environmental tracts about Egypt in 2013, *Environmental Politics in Egypt: Activists, Experts and the State*, sees beyond the dam and connects it to the ecological problems facing the country.

Part III. A Dead River?

Any internet search on the High Aswan dam will instantly bring up scientific studies about the negative ecological effects that transpired over the last fifty years. Not only are these studies a refutation of the dam but they are an implicit criticism of Egyptian high modernism. The ecological problems stemmed from the dam and the dam's attempt to control water as abiotic and manage agriculture on an industrial scale year-round. As the dam aged and inflicted changes on the river, the river in turn inflicted changes on the modernist plans.

Briefly, it generated five intensifying problems. First, without the seasonal flooding of the silt and organic matter from the volcanic headwaters, soil lost its natural fertility. This led to increased production of fertilizer using hydropower or importing it.[36] Second, by altering the regime flow of the river, the water table stayed permanently high year-round and this meant the native salts never washed out of the system as the flood waters decreased.[37] This had already been apparent as soon as the first Ottoman barrages went up and reiterated with the British construction of dams. As early as 1892, drain pipes were installed under fields to prevent water logging and pull away salts. The AHD increased crop output and acreage and this intensified the need for more expensive drainage works that were obtained through $25 million in World Bank loans the same year the dam was completed. AHD water is, in fact, expensive. The drainage systems need maintenance and often collect polluted salt-petro-fertilizer runoff which can't be reused for irrigation. Still, half the farms in Egypt do not have drainage pipes because drain systems are not rewarded in any egalitarian form. This dependency on government pipe subsidies and foreign drainage investments continues unabated.[38]

For all its pyramid swallowing depths, the lake behind the dam losses 20-30 percent through evaporation. This biochemical process leaves water behind the dam more saline which must ultimately be dealt with by farmers and culinary users downstream.[39] While this is a wholly natural process of having a lake in a desert, the process has intensified with climate change and this requires capturing more water in the lake to compensate for losses. In another blow to Egyptian livelihoods, the dam had a fourth downside because it upended the fishing industry. Plankton depend on the silt flooding into the ocean and the plankton, in turn, were devoured by sardines. As the floods were controlled and silt content reduced as it settled to the bottom of Lake Nasser, the plankton population shrank.[40] Finally, restricting the flooding character of the Nile has ended up exacerbating coastal erosion in the delta because those critical sediments are not building up at the river's confluence to the ocean. As the coastline retreats, more salt water moves

[36] Monsef et al., 1878.
[37] Ibid., 1882.
[38] Barnes, 145-152.
[39] Monsef et al., 1880.
[40] Hillel, *Rivers of Eden*, 129.

back into farm lands and freshwater areas.[41] All of these ecological problems require continuous and costly expenditures to temporarily mitigate.

More germane to our discussion are the ways the Egyptian state responded and continues to respond to these problems with the same high modernism that brought the dam to life in 1970. As early as 1968, Professor Mohamad 'Ab al-Fattah Kassas, a Botany scientist at Cairo University, found the government resistant to scientific assessments of the dam: "We kept telling the government and the party leaders that they should not confuse technical and political issues but keep them separate."[42] As environmental scientists within Egypt and abroad monitored the river's death, the government responded with building environmental agencies only to staff them with military and security officials with backgrounds in economics.[43]

A national dam with this much control over the river and Egyptian society required an ever-increasing water bureaucracy of experts and managers. The Ministry of Water Resources and Irrigation, which farmers call *al-rai*, "the irrigation," continued to grow larger and larger after 1970 to allocate water and monitor its quality. The system became increasingly hierarchical and distant from the demands of farmers, much higher now that rice became a monocrop and foreign companies compete with Egyptians for water use, and the actual consequences of the dam on the ecosystem.[44] Using the same modernist accounting methods of the 20th century, techno-experts within the government, *al-rai* and their new global partners in the 21st century promise large scale land reclamation and subsidies on monocrops will eventually pay out given enough time and dedication of water from Lake Nasser.[45] In areas where the government pursued land reclamation, this problem repeatedly smashed their efforts. Except for plants that had evolved to handle high saline soils and a lower level of nutrients, crops on reclaimed lands required continuous inputs of fertilizer and organic matter to make up for the lack of belched river silt.[46]

As the above problems intensified along with an economic policy of liberalization that increased farming demands even higher, the government redoubled technological efforts to make the dam fulfill its original promises in a privatized market. After a drought in the early to mid 1980s reduced the level of Lake Nasser by more than half, *al-rai*, advised the government to implement a strict amount of Nile flow indefinitely. This also meant reversing the promise of endless water to farmers and getting them accustomed to scarcity, which was further complicated by the fact that farmers in Nasser's Egypt had been promised water as a right.[47] Rather than listening to engineers about conservation methods or lowering the dam level so it could capture high runoff, the government and *al-rai* made no changes to the system in the mid-2000s. Much like Nasser's inability or unwillingness to look for alternatives, the state experts believe there is no alternative water practice that can irrigate farms, feed citizens and provide water to the cities.[48]

Still the dam could only retain so much water and when the upstream rains hit the dam, the lake started overflowing. Under President Hosni Mubarak, the government and *al-rai* undertook a large-scale reclamation project west of Lake Nasser to employ the excess water in the dam. The Toshka Lakes Project, another futurist creation much like the ones RCC had presented decades ago, promised to transform 2.5 million acres of desert into agriculture as a response to food insecurity and unemployment. Rather than let excess water pass through the dam and into

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[41] Monsef et al., 1883.
[42] Sowers, 23.
[43] Ibid., 35.
[44] Ibid., 129.
[45] Ibid., 129 and 133-38.
[46] Waterbury, *The Egypt of Nasser and Sadat*, 64-5 and 297-300.
[47] Barnes 6 and 52.
[48] Ibid., 55-6.

the fields for needy farmers where, in turn, it would exacerbate the above listed problems, the government pumps much of it into another lake and lets the saline waters evaporate in the desert, waiting for a future where reclamation will succeed.[49]

Considering the long list of ecological problems, removing the dam could offer a catchall solution.[50] The river would be dynamic again and behave much like it had evolved. Diligent environmental restoration and planning could reverse these effects. Additionally, dams have a short shelf-life because the rivers they block and lakes they create are scouring the infrastructure, finding seepage points below the dam and looking for the path of least resistance. The dam, it seems, has outlived its usefulness to Egyptian citizens but not to the state. Despite powering the post-revolution, the population continued to grow and outstripped the supply of power from the dam by the early 1980s.[51] While hydropower was the cheapest electrical option at the time, now solar technology and fossil fuels makes it expensive, especially when the generator must be shut down for repairs.

Environmental restoration could offer jobs to thousands of unemployed Egyptians in the Nile River Basin. These would be shovel ready type projects such as reforesting the banks of the river, dam removal, canal dredging and removal of the saline drainage pipes crisscrossing fields. In the cities, where so many places that formerly flooded have been urbanized, new construction would require rebuilding wetlands, floodplains and green infrastructure. Water efficiency in an era of climate change would demand the construction of new irrigation systems. Riparian restoration and dam removal will also stop coastal erosion and stop the non-point pollution from run off that is killing fish, both putting fishermen back in business. Industrial activities could continue as well through water pumps, screen pipes or consolidated diversions. This would not eliminate year-round agriculture all together. Above all, farmers could decrease the amount of fertilizer use and expensive drainage systems with the river in a more natural flow-flood regime.

The most useful question about dam removal is about how it might change citizenship itself. If dam construction centralized the state and built new citizens by altering interactions with the Nile, farming practices and other modernist systems, then could dam removal be a method of forcing Egypt into a messier, organic democratic discussion about the future of the country and what citizenship means? Access to water along multiple points rather than at one location would require pre-dam traditions of water use to return. While the *al-rai* would exist, the hierarchical structure of it might break down as different sections and counties along the river build their own water use and restoration plans.

Conclusion

In *al-Saad al-Aali* (The High Dam) painted in 1964, Abdel Hadi al-Gazzar attempted to capture the ideology behind of the dam and how it would remake the Egyptian citizen. In it, the new Egyptian citizen rises out of the middle of the Nile, with eyes forward to the future and the opportunities that await. The face might human and individual but the body is held up through a complicated set of steel beams and hinges, connected with wires and powered through hydro-electricity.[52] The brain consists of the same wiring and hardware:

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[49] Ibid., 53 and Charlotte Malterre-Barthes, "The Toshka Project: Colossal Water Infrastructures, Biopolitics and Territory in Egypt," *Architectural Design* 86(4) (2016): 100.

[50] To date only David Zetland has proposed doing this. Last modified February 10, 2012. Accessed April 20, 2017. http://www.aguanomics.com/2012/02/time-to-break-down-aswan-high-dam.html

[51] Monsef-Smith, 1877.

[52] Shalem 22 and 28.

 [53]

All of this suggests that the new Egyptian can't build himself—the state must build the citizen. In this process, tradition seems to disappear into the dam structure. Two peasants in the bottom right seem to be engulfed by the new materials. Individuals along the dam are isolated and miniscule. In another modernist trope, the natural world is obliterated. The Nile river has lost its curves and colors and now simply runs through a straightened channel before hitting the techno-man. The RCC and then U.A.R. regimented water in the same way they regimented Egyptian citizens, as abiotic machines capable of adjustments and within the objectives of freeing Egypt from dependency.

The High Aswan Dam was a technological machine built in long historical process of modernism in the west. This ideology, as *al-Saad al-Aali* demonstrates, was hardwired into dam construction. From the Tennessee Valley Authority to British low Aswan dam to the Hoover Dam, modernism saw the natural world as a threat and a commodity in need of state control. Containing and simplifying this abiotic system in a dam could generate hydropower and providing year-round water for culinary, industrial and agricultural use. Rather than creating complex, smaller diversion projects at the local level where participation would have been more democratic, from seasonal weirs to conservation practices to screened pipe intakes from the river to consolidated diversions (many of these technologies were practiced in pre-colonial Egypt) or adopting the complex farming practices both new and inherited, the large industrial type dam was pursued. The Nile doesn't not fully restrict Egyptian life or culture through environmental

[53] Ibid., 19.

determinism. Modern technology could have been used with agency but it would have required disconnecting it from the elaborate *techne* it was built with. For the Free Officers, this appeared to be the only method of liberating the country from continued colonial domination and poverty but this doesn't adequately explain their rationale.

Why, despite criticism from hydrologists like Ali Fathy and Abed al-Aziz before it's construction and scientists to the present day, does "the High Dam Covenant" persist in Egypt? The "Rule of Experts" lives on because high modernism was inherently imperialist and embedded itself into the orientalism that captured the minds of Egyptians, including the men who led the Free Officers Movement of 1952. Since it denigrated local history and tradition as unscientific, particularly in regard to the natural world and agriculture, homegrown alternatives and cultures were ignored in favor of ideas from the west. The Nile itself was forgotten or simplified in this vision, the local management and practice of making water was ignored and the farming practices that had developed before modernism were cast off and standardized. Modernism focused on the future and the speed of bringing that moment to life; it could not focus on enmeshing past customs and ideas within its framework. This was the cause of authoritarianism in modernism, not simply that it existed on its own, but that it built itself out of an inflexible view of making the state at the expense of the past and simplifying citizenship in homogenous ways. In this way, the dam, and in turn the state, exercised increasing authority over citizenship despite being far removed from the day-to-day existence of those using the water it stored. Whether removing the dam and restoring or remaking the river is worthwhile, this demolition project cannot happen until the dream of modernism is removed from Egyptian consciousness through a process only the citizens, not the experts, can undertake.

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