The Revolutionary City: Socialist Urbanisation and Nuclear Modernity in Cienfuegos, Cuba

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Abstract. During the Cold War, Havana symbolised the struggle for national liberation in Latin America. Yet like few other places the Cuban Revolution’s visions of development materialised in the southern city of Cienfuegos. This article examines why two half-finished nuclear reactors and a decaying ‘nuclear city’ remain in Cienfuegos today. Through a comprehensive spatial and infrastructural transformation of Cuba, the revolutionary government sought to remedy the evils of dependency and unequal exchange. Cienfuegos and its shifting place in the Cold War political economy demonstrates how a radical critique of urbanisation merged with the spatiality of centralised energy infrastructure in the pursuit of ultimately failed nuclear modernity. The history of Cienfuegos draws the academic gaze away from Latin America’s major cities to widen the geographies of theory in urban, energy, and Latin American studies.

Keywords: urbanisation, nuclear energy, infrastructure, unequal exchange, Cuban Revolution, Cold War

Ferrying across the Bay of Cienfuegos, I had the sense of being in a strangely global and historical place. I approached a once colonial city; later the epicentre of the Cuban Revolution’s visions for national development. To the west towered the distillation columns of a formerly Soviet but now Venezuelan-funded oil refinery and the chimneys of a Czechoslovak electricity plant. To the south-east lay the remains of a never-completed Soviet nuclear submarine base. On the stern, where the bay met the sea, rose a mighty concrete structure that in the 1980s was due to become the Revolution’s greatest achievement. Now the containment building of Cuba’s first nuclear reactor appeared a hollow shell. As a place, Cienfuegos seemed the product of complex socio-ecological relations that at one time or another had convened in this exact location.
The revolutionary government turned its attention to Cienfuegos in the 1960s to develop the country’s industrial capacity away from the Cuban capital. The Havana Declarations asserted Cuba’s independence from the neo-colonial world order, but the injustices of dependency could only be remedied by industrialising and urbanising the deprived regions. As architectural historian Roberto Segre argues, the revolutionary leadership neglected Havana to create a homogenous urban fabric across the island.¹ In Fidel Castro’s words, there would be ‘a minimum of urbanism and a maximum of ruralism’ when the Revolution transformed the country in its entirety.² On Cuba’s southern shores (Map 1), Cienfuegos became a key node in an international network that would allow the country to develop under historically fair conditions.

Map 1. Cienfuegos, Cuba

Alongside Cuba’s spatial transformation, the revolutionary government developed a distinct mode of energy infrastructure in Cienfuegos. Echoing Lenin’s maxim that ‘Communism is equal to Soviet power plus electrification of the whole country’, they invested heavily in a unified national electricity system, in the first instance powered with Soviet fuel oil. In the Cuban Marxist-Leninist reading of history, oil-based electricity was a material precondition for the nation’s transition to communism. As Cuba reached higher levels of social development, however, oil would give way to nuclear energy, epitomising the Revolution’s ability to transform the techno-material base of the national economy. While Cuba established a nuclear programme in 1976, starting work on a first reactor in 1983, nuclear development also materialised in new urban form across the Bay of Cienfuegos in the Ciudad Nuclear (Nuclear City).

² Fidel Castro Ruz, ‘[El encuentro] con los integrantes de la marcha al Segundo Frente “Frank País”’, Pinares de Mayari (Oriente), 26 Sept. 1966 (Havana: Stenographic version of the Revolutionary Government). I have translated this and all other quotations originally in the Spanish.
This article examines the place of Cienfuegos and the Ciudad Nuclear in the ideational world of the revolutionary leadership and explores how the city developed through industrial investments as part of the socialist international political economy. I draw on geographer Doreen Massey’s work to argue that cities should be understood relationally, as places that form through actions and processes that extend beyond them in space and time. Cienfuegos then serves as a prism for understanding the socio-political significance of urban change and energy development as one simultaneous process in the Cuban Cold War period. The focus on Cienfuegos contributes to an understanding of the Cold War where Cuba’s national history is seen neither as ‘an extension of empire’ nor through the primary lens of bipolar conflict. Cienfuegos also prompts us to look beyond the region’s major cities, whose significance are frequently overemphasised in urban and Latin American studies, granted their history as symbols of European power and dominance. The city further brings alternative circulations of knowledge to light in social science research on energy. This is a research field that predominantly has emerged from the encounter with a small set of countries in Western Europe and North America. Cuba’s joint urban and energy development demonstrates how leaders and planners attempted to enact social change through a


radical spatio-infrastructural transformation, aiming not only to break with the colonial past, but to bring nuclear modernity to the Caribbean. The effects of this transformation today raise questions about the links between urban form, energy infrastructure, and political economy in Cuba’s Cold War and after.

From Urban Dependency to Urban Revolution

In the eighteenth century, Havana developed into Cuba’s all-dominating urban centre. The capital constituted a key node in the Spanish imperial economy. In particular, control over Havana gave access to the transatlantic route on the westerlies, allowing ships to sail from the Americas to Europe. When Spain ceded Cuba to the United States in 1898, Havana also kept its status an outward-looking colonial hub. Beyond its harbour, the city provided spaces for political and economic administration over resource extraction in the sugar-producing hinterlands. Within Cuba, the seasonal rhythm of the sugar industry meant that work was abundant in the hinterlands during the labour-intense zafra (harvest). The dreaded period between harvests, usually lasting from June to December, was known as the tiempo muerto (dead period), and to escape it, rural dwellers migrated to Havana in search for jobs.

To the revolutionary leadership, the tiempo muerto, urbanisation, and Havana’s primacy resulted from Cuba’s incorporation into the colonial world economy. ‘Do you think that if we would have had the possibility to start planning the entirety of this country, we would have overindulged ourselves with a city as big as Havana?’ Fidel Castro notably declared to a crowd in Oriente Province in 1966. ‘Those enormous urban concentrations are anti-economic’, he suggested, ‘they are unaffordable; they are enormous human concentrations.’ In the colonial metropoles, whether

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8 García, Beyond the Walled City.
9 Castro Ruz, [El encuentro] con los integrantes de la marcha al Segundo Frente “Frank País”. The use of Fidel Castro’s speeches as primary sources in the following is less motivated by their factual claims about historical events and more by their importance for reconstructing the revolutionary leadership’s ideational world. Even so, his
in Europe or North America, urbanisation had been the product of industrialisation. In Latin America and the Caribbean, by contrast, urbanisation resulted from colonial resource extraction serving the metropole’s industrial development. Without domestic industrialisation, Havana was draining Cuba’s rural areas of resources while large parts of the urban population remained in poverty without employment.\(^{10}\) Among Latin American dependista theorists more widely, this analysis gave rise to notions of ‘urban inflation’ and ‘overurbanisation’ when the ‘surplus of unproductive population’ was destined to live in slums and work in the informal economy.\(^{11}\)

Having entered Havana in January 1959, Fidel Castro’s new government soon set up a Department of Physical Planning to oversee Cuba’s urban and regional development. According to its first director, Felipe Prestamo, the intention at this point was to focus on regions away from Havana.\(^{12}\) On the one hand, the government sought to reduce the primacy of the capital in terms of economic activity and population growth. By turning away from it, the dependency relation between Havana and its hinterlands would be broken, allowing the deprived regions to develop.

Addressing the International Organisation of Journalists in 1971, Carlos Rafael Rodríguez, one of Cuba’s most senior government and Party officials, argued that Havana had been ‘the developed capital of an underdeveloped country.’ By the early 1970s, however, the government’s neglect of the capital, counteracting the legacy of colonialism, was showing results: ‘That Havana no longer exists and will never exist again. Our capital today is the stagnant capital of a country in development.’\(^{13}\) Indeed, the government even attempted to ‘ruralise’ Havana. In the late 1960s, Fidel Castro urged the habanero population to farm the Cordón de La Habana, a green belt around


\(^{13}\) Cited in Eckstein, ‘The Debourgeoisement of Cuban Cities’, p. 94, my emphasis.
the capital, intending to boost, but resulting in a slump in Cuban coffee exports. He also exhorted them to work in the cane fields to achieve the ultimately unsuccessful 10 Million Tons Zafra of 1970.\footnote{Note that the notion of ‘ruralisation’ had very different implications in the Cuban and Soviet contexts. In the Soviet Union, ruralisation was used to describe the forced resettlement of peasants to cities during the Stalin period, see Stephen Kotkin, Magnetic Mountain: Stalinism as Civilization (Berkeley, CA: University of California Press, 1998), pp. 107–8.}

As Gugler concluded with some hindsight, the government’s intention to counteract the growth of Havana reflected the view that it ‘represented the evils of old society’.\footnote{Josef Gugler, ““A Minimum of Urbanism and a Maximum of Ruralism”: The Cuban Experience”, International Journal of Urban and Regional Research, 4: 4 (1980), p. 521. Walking the streets of Havana today, the effects of the government’s intentional neglect can still be traced in the urban landscape’s dilapidated buildings and rundown infrastructure.}

On the other hand, the government would create an integrated network of larger and smaller urban areas, creating an evenly urbanised fabric across Cuba. Urban centres would be joined in terms of economic planning and coordination, political representation, cultural norms and, crucially, nationally-spanning infrastructure. Paul Susman argues that the goal of ‘urbanising the countryside’ meant that the state would provide the population with services and other use-values ‘consonant with the social goals of improved service provision and enhanced equality.’\footnote{Paul Susman, ‘Spatial Equality in Cuba’, International Journal of Urban and Regional Research, 11: 2 (1987), p. 233.}

In urban areas, Cubans would have access to centralised electricity and water supplies, sewage treatment and telephone lines. There would be easy access to hospitals and schools. While these were aspects of revolutionary development that Fidel Castro had identified in the Moncada Programme, he frequently reiterated that only national infrastructure and urbanisation of the country’s interior could resolve the problems facing Havana, breaking the spatiality of dependent urbanisation. To maintain a stable water supply in Havana was one of the most pressing concerns.\footnote{Fidel Castro, La Historia me absolverá (Edición anotada) (Havana: Oficina de Publicaciones del Consejo de Estado, 2008 [1953]); Fidel Castro Ruz, ‘La conmemoración del XIII Aniversario del Asalto al Cuartel Moncada’, Havana, 26 July 1966 (Havana: Stenographic version of the Revolutionary Government); Castro Ruz, [El encuentro] con los integrantes de la marcha al Segundo Frente “Frank País”’, 26 Sept. 1966.}

Infrastructurally, the construction of the state rationing system distinguished Cuba’s socialist urbanisation process from other places. The government devised the rationing system in 1962 to ensure distributional equality. Across the country, each household received a rationing card (\textit{libreta})
and was entitled to a basket of foodstuffs and consumer goods to be collected in an integrated system of ration shops (bodegas). As infrastructural spaces for centralised redistribution, the bodegas constituted moments in the production of urban space but also in the nationally-integrated socialist state. With urban infrastructures, the state extended its power to logistically implement political decisions, aiming to transform living conditions throughout the country.\(^\text{18}\) As Kale has shown in the case of electrification in independent India, electricity – on a par with the bodega – was ‘both object of and mechanism for’ the formation of the socialist state in that it simultaneously symbolised and enabled socialist urban practice.\(^\text{19}\) Hardly by accident, the Cuban census came to define urban areas as much based on population density as the accessibility of urban infrastructures – socio-technically integrating and coordinating the socialist state.\(^\text{20}\)

From the government’s point of view, the urban restructuring of Cuba would follow alongside a transformation of the nation’s economic structure. After the Revolution, urbanisation would be coeval with industrialisation. The territorial extension of networked electricity infrastructure was essential to this task, as we shall see. The effects of industrialisation would be as much socio-economic as spatial. When the state opened factories and educated the workforce, the productive forces would develop, and workers would agglomerate in urban areas. Factories would also generate work for the already deprived urban populations. In the countryside, Fidel Castro urged small-farmers to move towards ‘superior forms of production’ – a shorthand for collectivisation and mechanisation.\(^\text{21}\) Entering into successively larger social units, pooling mechanised resources, peasants would become agricultural workers. Ultimately, the peasantry would wither away as an archaic social class of antes as the rural population became proletarians.

working for the state and, hence, themselves as a national collective. At once, peasants would live in successively denser, more urban areas, moving from chozas and bobíos (huts and shacks) to modern, infrastructurally-integrated housing.\textsuperscript{22}

To this end, two actions were taken primarily. First, the government nationalised all urban land, passing the Urban Reform Law in 1960. Nationalisation would allow the state to plan urban land-use rationally instead of relying on the haphazard law of value (i.e. market forces) for this historically essential task.\textsuperscript{23} At the same time, the Urban Reform Law would reduce class-based urban differentiation, issuing that one nuclear family could own one property alone and putting a cap on rents.\textsuperscript{24} Second, the government gathered data to draw up plans for cities away from Havana. Notably, they delegated to the Department of Physical Planning to prepare development plans for six of Cuba’s secondary cities. From east to west: Santiago de Cuba, Holguín, Camagüey, Cienfuegos, Santa Clara, Matanzas, and Pinar del Río.\textsuperscript{25}

Susman argues that the new regional focus was successful in as much as migration to Havana slowed during the 1960s.\textsuperscript{26} Eckstein also confirms this fact, noting that Havana had the lowest growth rate of any Cuban city in terms of population in the late 1960s, even though the growth rate had started to decline already in the decade prior.\textsuperscript{27} With restricted economic resources, however, it proved difficult to replicate the infrastructural and industrial development existing in the capital in other parts of the country. ‘[T]he legacy of an “over-urbanized’ past, continued to haunt the new regime’, as Susman suggests.\textsuperscript{28} Even though it had eradicated class exploitation, Fidel Castro argued, the Revolution still suffered from the legacy of dependent urbanisation:

\begin{itemize}
  \item \textsuperscript{22} Alvarez, \textit{Cuba’s Agricultural Sector}.
  \item \textsuperscript{23} See Helen Yaffe, \textit{Che Guevara: The Economics of Revolution} (Basingstoke: Palgrave MacMillan, 2009) for a discussion on economic policy in revolutionary Cuba.
  \item \textsuperscript{24} Barkin, ‘Confronting the Separation of Town and Country in Cuba’, p. 33.
  \item \textsuperscript{25} Prestamo, ‘City Planning in a Revolution’.
  \item \textsuperscript{26} Susman, ‘Spatial Equality in Cuba’, p. 223.
  \item \textsuperscript{27} Eckstein, ‘The Debourgeoisement of Cuban Cities’, p. 93.
  \item \textsuperscript{28} Susman, ‘Spatial Equality in Cuba’, p. 223.
\end{itemize}
If you analyse it, there is a very unequal distribution of resources in the nation, because with man’s exploitation of man having disappeared or being under way of totally disappearing in the sense of existing proprietary classes and dispossessed classes, we find ourselves with a sub-product of capitalist exploitation, which is the exploitation of the countryside by the city.29

In 1969, as a result, Fidel Castro announced that his government would focus most of its attention on three major regions with pre-existing infrastructural development.30 New industrialisation projects would be allocated to the provinces of Havana, Oriente, and Las Villas. In Las Villas, Cienfuegos was the regional centre.

**Industrialisation in Cienfuegos**

Despite Havana’s primacy, Cienfuegos had developed into a regional economic centre over the past century. The city was established by a group of French émigrés from Louisiana in 1819 on the site of a former Taíno settlement. Following the Haitian Revolution of 1791, the Caribbean saw a wave of white migration from the formerly French colony east of Cuba. Louis Pérez Jr. estimates that up to 30,000 French settlers arrived in Cuba in the 1790s. Given that Haiti (then Saint Domingue) had been the world’s leading sugar colony for much of the eighteenth century, the French migrants brought capital and experiences in sugar but also coffee farming with them. When Napoleon sold Louisiana to the United States in 1803, in turn, a second wave of French migrants set sail for Cuba. At this time, the Cuban sugar industry expanded fast, thriving in the calcareous clay soils of Las Villas in particular.31

In comparison to the inland Las Villas towns of Santa Clara and Sancti Spíritus, Cienfuegos’ location by a deep-sea bay provided a protected space for sugar shipments into the Caribbean Sea.

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When Santa Clara was connected to Cienfuegos by rail in 1850, Cienfuegos thus turned into a regional hub in the colonial export-economy. The urban form of Cienfuegos still reflects its historical role in the colonial political economy: the harbour constitutes the city’s western perimeter, and the city then pivots around a central plaza, the Parque José Martí (prior to 1902, the Plaza de Armas), with a cathedral devoted to Virgin Mary and former offices for the colonial ayuntamiento (city council) and merchant corporations (Figure 1). A pedestrian walkway, the Paseo de Prado, extends north to south, forming a spine in a perfect orthogonal city grid. When the town centre was nominated to become a UNESCO World Heritage Site in 2005, the application file suggested that ‘[t]he city’s elegant and perfect neo-classical design, with the shape of a chessboard which extends along its urban perimeter, constitutes an exceptional exponent of the Cuban and Caribbean 19th Century’.

Figure 1. Parque José Martí, Cienfuegos

Source: G. Cederlöf, 2019

In the 1960s, Cienfuegos retained its role as a regional economic centre. Initially, the revolutionary government had attempted to diversify the national economy, identifying the sugar monoculture as the source of Cuban underdevelopment. A return to sugar, however, provided an immediate source of export revenue for the financially-strained government. To blame a crop for the country’s underdevelopment was also from a Marxist point of view to fetishise it, attributing agency to a thing rather than the social relations it embodied. Before long, the harbour

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in Cienfuegos again constituted an essential outward-looking node in a global network revolving around cane sugar. But now a radically different set of social relations were seen to meet in this node, facilitating regional industrialisation and urbanisation. Cuban sugar shipments were no longer destined for Spain or the United States but the Soviet Union and the member-states of the Council of Mutual Economic Assistance (CMEA).\footnote{The Soviet-dominated CMEA, also known as the COMECON or in Spanish CAME, coordinated trade and cooperation between socialist states. After Cuba’s formal entry in 1972, the full members included Bulgaria, Cuba, Czechoslovakia, East Germany, Hungary, Mongolia, Poland, Romania, and the Soviet Union. Vietnam joined in 1978.}

The Cuban government struck a first trade deal with the Soviet Union in February 1960, including 900,000 tons of oil, which were estimated to save Cuba 24 million dollars in one year. Facing US discontent, the Cuban government argued that it was their right as a sovereign nation to trade with whomever they liked, stressing that even US-aligned Brazil was trading with the Soviet Union.\footnote{Anon, ‘Cuba revolucionaria ganará también la batalla de los abastecimientos’, Revolución, 6 July 1961, pp. 2, 4–7, 10; see Tobias Rupprecht, ‘Socialist High Modernity and Global Stagnation: A Shared History of Brazil and the Soviet Union during the Cold War’, Journal of Global History, 6: 3 (2011), pp. 505–28 for an account of Soviet-Brazilian relations during the Cold War.} In comparison, the Soviet leader Nikita Khrushchev was pursuing an export-oriented strategy at this time, making use of the Soviet Union’s vast oil and gas resources to increase Soviet influence in Asia, Africa, and Latin America. While approaching Cuba, the Soviets also offered generous trade deals to a range of countries in the Third World, including Ceylon, India, Ghana, Argentina, and Brazil.\footnote{Arthur Jay Klinghoffer, The Soviet Union and International Oil Politics (New York: Columbia University Press, 1977); Rupprecht, ‘Socialist High Modernity and Global Stagnation’; Noel Maurer, The Empire Trap: The Rise and Fall of U.S. Intervention to Protect American Property Overseas, 1893–2013 (Princeton, NJ: Princeton University Press, 2013), pp. 332–6.}

Cuban-Soviet commerce was established as a countertrade of oil and consumer goods for sugar. Both parties argued that this agreement undermined the ‘unequal exchange’ relations that otherwise existed between developed and underdeveloped nations in the capitalist world economy. Unequal exchange entailed that international wage differences allowed industrialised countries to import a surplus of ‘value’, representing labour-time embodied in traded commodities. While this
surplus enhanced their development, agrarian nations were drained of value, perpetuating their underdevelopment. In the interest of advancing socialism globally, Cuba and the Soviet Union would break this unjust market logic, establishing equal-exchange relations through politically-defined terms of trade. Symptomatically, the first major development in Cienfuegos after the Revolution was a new harbour terminal where raw sugar could be loaded in bulk to facilitate trade with the socialist bloc. The ‘Tricontinental’ Terminal for Sugar Loading in Bulk opened in 1967 in an area known as O’Bourke, northwest of Cienfuegos’ historical centre. The terminal’s name celebrated the Tricontinental Conference that had been held in Havana the year before, positing the Cuban Revolution as a model for national liberation and development across Asia, Africa, and Latin America.

The revolutionary government increasingly identified sugar as a vehicle for industrialisation of the agrarian economy. Unusually for a crop, sugarcane lends itself well to centralised production. Production requires a large mill (aptly known as a ‘central’) where cane stalks can be crushed quickly to avoid fermentation. In Cuba, Roberto Segre argues, the centrals were ‘true “factories” situated in rural areas’. Around them, company towns known as bateyes provided spaces for business management and worker accommodation. Thus, the centrals – carrying urban form – were a means to overcome the contradiction between city and countryside.

While increasing the country’s export-capacity, the ‘Tricontinental’ was also key to the mechanisation of the sugar sector. In 1978, Fidel Castro inaugurated a similar terminal in the province of Las Tunas and explained that the ‘Tricontinental’ had served the Cuban people in two ways. On the one hand, it had saved the country hard currency as bulk loading took away the need

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for sugar sacks. Sacks had to be imported from abroad. Over the past decade, more than 10 million tons of sugar had been loaded in Cienfuegos, and counting savings from sack purchases alone, Fidel Castro estimated that this equalled around 50 million unspent pesos in hard currency.42

On the other hand, the mechanisation of sugar loading had saved Cuban workers hundreds of thousands of hours of hard labour. Sugar sacks had to be carried, but bulk loading was automatic. In a capitalist society, Fidel Castro argued, mechanisation would have taken labour-time away from the worker, the machine competing with the worker for labour. But in socialist Cuba, the machines in the ‘Tricontinental’ had instead liberated Cuban harbour workers from hard labour as the machines were put to use in the workers’ own interest. ‘That is what socialism entails’, Fidel explained, ‘that when a technology is introduced it is not to enslave the worker, it is not to exploit the worker, it is not to make the worker redundant, but to help him. And so, the technology liberates thousands of our harbour workers from that hard labour.’43 Indeed, in the ideational world of the revolutionary leadership, mechanisation and automation generated ‘development’ by freeing the Cuban population from work as the productive forces advanced.

Still, the ‘Tricontinental’ was only one of several industries that opened in and around Cienfuegos from the late 1960s to the late 1980s. While the colonial economy had converged on Havana, Cienfuegos and southern Las Villas were now at the centre of the revolutionary economy. Two features characterised the new investments. First, many new industries enhanced the economy’s dependence on sugarcane. A torula factory in Covadonga and a subsidiary fertiliser plant in O’Bourke provides a telling example. Covadonga is a batey approximately 50 kilometres west of Cienfuegos while torula is a protein-rich yeast that would be used as feed in the chicken runs around Cienfuegos. The torula factory opened in 1977, and at its inauguration, Fidel Castro

reported that the plant would employ 111 workers and produce 40 tons of yeast per day. They had localised the factory at the site of a large sugar central, the CAI ‘Antonio Sánchez’. To grow torula, workers would allow bacteria to ferment cane syrup (miel) deriving from the mill. Production also required water, ammonium phosphate, and urea, and the two latter products would derive from the fertiliser plant in O’Bourke, which was of British origin. In a chronicle of Cienfuegos’ industrial history, the Cuban media outlet Radio Rebelde relates how the fertiliser plant let ‘yellow smoke into the air’ for the first time in 1974. Before long, however, the machinery broke. Fidel asserted that ‘all the defects and […] all the botched jobs [chapuerías] the English made in that plant’ were to blame. Production only resumed in 1978, but then both the torula and the fertiliser plant tied into the economy that overwhelmingly relied on sugar exports. Gainfully, torula was a domestic source of edible proteins via poultry farming, but it relied on a continuous supply of cane syrup.

Second, the new industries tightened Cuba’s relations with the CMEA. As noted in the fertiliser case, the factories that would establish a domestic industrial capacity had to be imported from abroad. In 1984, 52 industrial installations had been assembled in Cienfuegos Province since the Revolution, according to the Cuban leader. These ranged from a dairy plant in Cumanayagua and the torula plant in Covadonga to plants for wheat milling, mineral-water bottling, and floor-tile production. Most plants did not come from the West, however, but fellow socialist countries.

One of the largest factories – the ‘Carlos Marx’ – would produce cement. This factory was located by a large limestone formation in Guaibaro, just outside Cienfuegos. The ‘Carlos Marx’ was imported from East Germany, and to this end, the German Democratic Republic reportedly provided Cuba with a 60-million-peso credit, to be repaid over 10 years at 2 per cent interest. Cuba had to start repaying the credit as soon as the first of three production lines became active.\(^{50}\) The cement, in turn, would primarily be used for housing construction to meet the demand for urban accommodation. For construction purposes, three factories produced prefabricated housing modules in Cienfuegos. The most advanced of these employed the IMS system, a Yugoslav construction technology using prefabricated concrete structures to build multi-story buildings.\(^{51}\)

To inaugurate the cement factory, the East German leader Erich Honecker visited Cienfuegos. Fidel Castro stressed how sweet a deal the factory was for the Cuban population during the inauguration: ‘Look for yourselves what magnificent terms of credit’, he urged the crowd. But he also pointed out that Cuba required these kinds of conditions to develop an industrial capacity – ‘what magnificent financial conditions to be able to build this factory’.\(^{52}\) If Cuba would have imported the plant from a capitalist country, as in the case of the fertiliser plant, they would have suffered from unequal exchange. In the revolutionary understanding of international political economy, Cuba no longer had to suffer from unequal exchange when they integrated their economy with the CMEA countries. According to Fidel, trade on preferable terms with already industrialised countries in the socialist bloc, such as Honecker’s East Germany, allowed Cuba to develop its economy under historically fair conditions: ‘The development of these relations gives more solidity to our economy, it makes it less dependent on the Western markets, on the highs and lows and on the crises of this market; it makes it much less dependent on the


unequal exchange that we have with the capitalist world.\textsuperscript{53} The Revolution therefore made Cuba a Latin American exception, having escaped the yoke of unequal exchange. The ‘Carlos Marx’ Cement Factory in Cienfuegos testified to this historical feat.

Industrialisation also brought with it urban change. Fidel Castro argued that the construction workers played a crucial role in Cuba’s transformation as ‘they have transformed the physiognomy of the country’.\textsuperscript{54} Alongside Cienfuegos’ factories, the construction workers were building aqueducts and sewers; they were putting up houses and shops, libraries, hospitals, and schools. Urban change was most clearly seen in the regional cities. Many of these had seemed like small villages (\textit{aldeas}) before the Revolution, Fidel explained. To speak of construction then was ‘to speak of the fifth wheel of the car’. The politicians invested in a few small works during the \textit{tiempo muerto}, when the people were begging them for employment. But after the Revolution, ‘when the necessity to develop all lands arose’, the country had finally developed a modern construction industry with thousands of construction workers.\textsuperscript{55} Indeed, in the mid-1980s, the growth of Cienfuegos was ‘a reflection of the Revolution in the entire country’, generating development away from the parasitical capital. And yet, while Cienfuegos could pride itself with great industrial development, there were still many things that Cienfuegos lacked in comparison to other cities. The pre-revolutionary past was still making itself felt as capitalism and colonialism had left ‘a situation of great inequality, not only social inequality, but inequality between regions’.\textsuperscript{56}

The urbanisation process was also visible in the statistical yearbooks. According to the Cuban censuses of 1970, 1981, and 2002, the proportion of the population in the province of Cienfuegos who also lived in the city increased from 27.2 to 31.5 to 35.6 per cent between the census-years.\textsuperscript{57}

\textsuperscript{56} ONEI, \textit{Anuario estadístico de Cienfuegos 2015}, tables 3.1, 3.15.
Rodríguez García also concludes from Cuban demographic data that the provincial population living in urban settlements with more than 200 inhabitants increased from 8.85 to 32.3 per cent between 1981 to 2002. In Cuba overall, the urban population grew only marginally from 1960 to 1970 – from 58.4 to 60.3 per cent – but then increased markedly, with 68.1 per cent estimated to live in urban areas in 1980 and 73.4 per cent in 1990.

**The Nuclear Revolution**

In the 1980s, Cienfuegos was the scene of the largest industrial project the country had witnessed thus far. The Cuban government decided to build a nuclear power plant in Juraguá at the mouth of the Cienfuegos Bay. Framed as *La Obra del Siglo* (the Project of the Century), the Juraguá plant would have four reactor-generator units, each with a capacity of 417 megawatts (MW). In the first instance, the government proceeded to build two reactors, construction starting on the first in 1983 and the second in 1985. The power plant was part of a larger nuclear programme through which four more reactors eventually would operate in the province of Holguín and another four in Pinar del Río. One day, Cuba would rely on nuclear fission alone for electricity generation. Electrification, in turn, was critical to the successful infrastructural integration of Cuba. With a centrally-controlled national grid, industrial production was not geographically limited to places with energy resources *in situ* but could be ‘rationally’ developed by the socialist government without concern for limited energy supplies.

The reactors had a Soviet design known as VVER-440. ‘VVER’ was the Russian acronym for water-water energy reactor, meaning that pressurised water would be used to cool and moderate the reactor core. ‘440’ implied that the reactors normally would have a capacity of 440 MW. Cuba

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nonetheless opted for a plant with several non-standard features for the reactor type. Model V-318 would have containment buildings to prevent radioactive fallout in the case of a meltdown. The buildings would also resist the shockwave from a direct aircraft hit. As Cienfuegos was located in a seismically active area, moreover, the reactors were designed to withstand an earthquake. The plant was sited at only 17 metres above sea-level, which would ensure that it had a continuous supply of cooling-water in the event of a tsunami. The likelihood of a tsunami forming in the Caribbean Sea was one in 10,000 years, according to Fidel Castro, and in government discourse, the precautions taken even in this regard attested to the level of safety characterising the project. As a result, the reactors would also have a lower electrical output than the standard Soviet model.

Nuclear power again resonated with the belief in technology as a liberating force, which would bring socialist development to Cuba. The plant would develop the country’s productive forces in one nuclear leap, thrusting Cuba on to a higher stage of techno-material development. Already in the Moncada Programme, Fidel Castro suggested that nuclear energy would allow a progressive government to electrify the entire country, ‘given that the application of nuclear energy is now a reality in this branch of industry’. In 1984, he boasted that the first reactor then under construction in Juraguá would have a greater capacity on its own than the combined electrical industry prior to the Revolution. In all of Latin America, only Argentina and Brazil had successfully developed nuclear capacity with their Atucha, Embalse, and Angra plants. Thus, the nuclear reactors in Juraguá testified to the progress the Revolution brought not only to Cuba, but to Central America and the Caribbean.

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63 Castro, La historia me absolverá, p. 53.
It is important to remember that the modernisation process essentially had the same material characteristics when Cuba followed the Soviet development model as compared to the US example in the early twentieth century. As Paul Josephson reminds us, engineers and politicians in both the Soviet Union and the United States frequently looked to each other to make sure they were on the right ‘development’ track.\(^67\) From the Marxist-Leninist point of view, the difference between capitalist and socialist development was that modern technology entered into qualitatively different social relations in the two Cold War blocs. Under capitalist relations of production, more advanced productive forces increased the exploitation of the working class; under socialism, they contributed to the liberation of the proletariat. Materially, however, mechanisation, electrification, and automation were neutral features of an imminent nuclear modernity.\(^68\)

Studying the Cuban nuclear programme, the US-based scholar Jonathan Benjamin-Alvarado suggests that the Cuban leadership pursued the project above all for international prestige.\(^69\) In Cuba, by contrast, the Executive Secretary of the Cuban Atomic Energy Commission (CEAC) argued that Cuba ought to be entitled to nuclear power as a sovereign nation.\(^70\) Nuclear technology represented the most advanced material base of any developed nation, and nuclear power was a historical necessity for the development of Cuba’s productive forces. The Executive Secretary was Cuba’s leading nuclear physicist, Fidel Castro Díaz-Balart, who also happened to be the Cuban leader’s firstborn son. Fidelito, as he was known, was appointed to lead the development of both electrical nuclear capacity and radiochemical applications in the pharmaceutical and agricultural industries. Under the purview of the CEAC, Cuba would develop a standalone nuclear industry.


that ultimately would be independent of foreign technicians and advisers.\textsuperscript{71} For the time being, however, the project was unthinkable without Soviet support. ‘Only within the framework of cooperation between the socialist countries is it possible for a country like Cuba to undertake this giant project’, a propaganda film from TeleNuclear, aired on Cuban television in the 1980s, made clear.\textsuperscript{72}

Beside the nuclear plant, the government was developing Cienfuegos into a hub in the energy sector. While Fidel Castro Ruz had identified nuclear energy as the definitive solution for electricity generation, electrification had proceeded based almost exclusively on fuel-oil combustion since 1959. Prior to the Revolution, the Florida-based Compañía Cubana de Electricidad had also supplied electricity generated in oil-fired thermoelectric power plants, albeit primarily to white, affluent urban areas. At that time, three multinational companies – Standard Oil of New Jersey (Esso), Texaco, and Royal Dutch Shell – delivered fuel oil to the Compañía via their refineries in Havana and Santiago de Cuba. In 1960, however, the Eisenhower administration urged the refineries to cease operations, following the Cuban leadership’s trade deal with the Soviet Union for complementary oil imports.\textsuperscript{73} As the conflict escalated with a US oil blockade, the revolutionary government nationalised the refineries along with the Compañía Cubana de Electricidad, the Cuban Telephone Company, and 36 sugar mills on 30 August 1960. Soon, the United States’ blockade developed into the more general trade embargo against Cuba. Fortunately for the Cuban revolutionaries, the Soviet Union agreed to fill the supply gap left by the United States by exporting oil in exchange for sugar – at that, on the highly beneficial terms that undermined unequal exchange.

Subsequently, the Cuban government invested heavily in thermoelectric generating technology to facilitate industrialisation and automation. In the late 1960s, new power plants

\textsuperscript{71} See further Castro Díaz-Balart, ‘La energía nuclear en Cuba’; Castro Díaz-Balart, Nuclear Energy.
\textsuperscript{73} Maurer, The Empire Trap, pp. 314–27.
opened in Mariel, Santiago de Cuba, and Nuevitas with Soviet technology. In O’Bourke, the nationalised utility synchronised the CTE ‘Carlos Manuel de Céspedes’ with Cuba’s Western grid in 1978. The plant’s first two units each had a capacity of 66 MW, this time imported from Czechoslovakia, and the plant was later expanded with two generators from Japan, each good for 169 MW.\footnote{Castro Ruz, ‘El acto de inauguración de la Termoeléctrica “Carlos Manuel de Céspedes”, celebrado en ocasión de comenzarse el Día del Constructor’, 5 Dec. 1978.} A short distance from the power plant, the government also sited a new oil refinery to be built with Soviet support in the course of the 1980s. It was the largest industrial project in the region beside the nuclear plant.\footnote{Castro Ruz, ‘El acto central por el XXXI Aniversario del Asalto al Cuartel Moncada’, 26 July 1984.} The refinery’s bayside location would facilitate Cuban petroleum exports, but the fuel oil coming out of it could conveniently be used in the thermoelectric down the road.\footnote{Castro Ruz, ‘El acto de inauguración de la Termoeléctrica “Carlos Manuel de Céspedes”, celebrado en ocasión de comenzarse el Día del Constructor’, 5 Dec. 1978.}

Hence, also in the energy sector, Cienfuegos entered into a network of socio-ecological relations with international reach: the Cuban Ministry of Sugar (MINAZ) exported sugar produced in the Las Villas area, in part via the ‘Tricontinental’ loading terminal in O’Bourke. In return, the Soviet Union sent crude oil to Cuba’s refineries. When complete, the refinery in Cienfuegos would be a key node in this trade network. MINAZ then used oil products of various kinds in its mills, cane harvesters, and lorries, while the nationalised utility combusted fuel oil in its thermoelectrics to provide electricity for industrial and residential use. Cuba’s industrialisation in general, and Cienfuegos’ in particular, thus even more closely interwove with the sugar monoculture and Cuba’s international relations with the Soviet Union.

Here, however, the nuclear power plant would play a highly strategical role in the eyes of the revolutionary government. The propaganda film from TeleNuclear asserted that the plant would ‘represent a qualitative change in the national energy system’.\footnote{TeleNuclear, ‘CEN Juraguá’.} By substituting enriched uranium for oil, the nuclear reactors would reduce the need for oil imports significantly. With four reactors
in Juraguá, Fidel Castro estimated that the plant would displace up to 2.4 million tons of fuel oil per year.\(^{78}\) This would again transform the geometry of social and ecological relations convening in Cienfuegos. Reduced oil dependence would allow the Cuban government either to cut back its oil imports, diminishing its dependence on the Soviet Union, or to re-export Soviet oil for hard currency on the international markets.\(^{79}\) Fidel reasoned that nuclear energy thus in all cases would enhance Cuba’s development, as the oil saved would constitute a great financial saving or source of income for the socialist state.\(^{80}\) More widely, Sonia Schmid argues that the European CMEA states that also imported Soviet nuclear technology – notably East Germany, Czechoslovakia, Bulgaria, and Hungary – saw nuclear energy as a means for reducing their dependence on oil and gas imports from the Soviet Union. The Soviet government, by contrast, regarded nuclear transfer as a way to ‘strengthen inner-bloc ties and to further demarcate their sphere of influence.’ Schmid suggests that this contradiction was resolved in the socialist countries’ shared belief in advanced nuclear technology as an essential material base for historical progress.\(^{81}\)

\[\text{Cienfuegos in the Nuclear Cold War}\]

Cienfuegos’ future as a nuclear city made it a centre of contestation in the bipolar Cold War. Given Cuba’s geopolitical role following the \textit{Crisis de Octubre} (the Cuban Missile Crisis), Cienfuegos developed what Gabrielle Hecht would call dangerous ‘nuclearity’ in the eyes of the United States. Nuclearity is a socially-contingent practice whereby a place or an object gets designated as ‘nuclear’ with political implications.\(^{82}\) In this regard, the construction of the Juraguá plant was not the first instance that rendered Cienfuegos a nuclear place.

In August 1970, aerial photographs from a US reconnaissance mission indicated that Cuba was building a new naval facility on Cayo Alcatraz, a small island in the south of the Cienfuegos Bay. Next to a set of barracks, the photographs also showed a football field. To the CIA’s analysts this constituted an inconsistency: Cubans played baseball, not football. Russians did, however. Previously, in July 1969 and again in May 1970, Soviet Foxtrot and Echo-II class submarines had called at Cienfuegos to be serviced by accompanying tenders. When two barges arrived with equipment to dispose of radioactive waste from submarines in September 1970, the United States raised the issue to a matter of top-level diplomacy.\(^\text{83}\) Evidence suggested that the Soviet Union was building a base for missile-carrying nuclear submarines. On 25 September 1970, the Soviet Ambassador to Washington received a note from President Nixon, stating that the United States regarded Soviet actions as a possible breach of the ‘understanding’ reached after the 1962 Missile Crisis.\(^\text{84}\) This understanding implied that the United States would refrain from invading Cuba, as long as the Soviet Union withdrew all offensive weapons from the island.

The Cienfuegos crisis was largely resolved through informal conversations between Soviet Ambassador Dobrynin and US Secretary of State Kissinger. Now declassified memoranda from these exchanges show that an oral agreement was reached on 6 October to honour the understanding from 1962. Even so, the Soviet government insisted on its navy’s right to periodically visit Cienfuegos, or any other port, in accordance with international maritime law. Kissinger admitted that this was a right the United States hardly could deny them.\(^\text{85}\) Despite the agreement, the Soviet Union continued to tender submarines in Cienfuegos. In February 1971, they serviced a November-class nuclear attack submarine, and the conflict heated up again. At this point, Kissinger forwarded a new note from Nixon submitting that submarine tenders had been


\(^{85}\) Keefer et al., *Soviet-American Relations*, memos 85–6, 97.
in or around Cienfuegos for 125 of the past 166 days and that the United States saw this as a breach of their mutual understanding.\textsuperscript{86} The Soviet Union then withdrew their nuclear submarines and tenders and Cienfuegos’ status as a nuclear place waned for the time being.

In April 1986, however, when construction had started on the reactors in Juraguá, disaster struck at the ‘V. I. Lenin’ Nuclear Power Plant in Chernobyl. Critics in the United States soon suggested that the Juraguá plant was a ‘Cuban Chernobyl’ in waiting. In case of a reactor meltdown, they estimated that radioactive fallout would create ‘serious ecological damage as far north as Tampa, Florida’, not to mention in the Cuban archipelago.\textsuperscript{87} Cubans who had been involved in the construction works, but emigrated in the 1990s, also reportedly claimed that essential welding jobs had been poorly carried out and constituted a safety threat.\textsuperscript{88} To the contrary, Fidel Castro Díaz-Balart insisted on the power plant’s safety. On the one hand, the Chernobyl reactor had a completely different design from the Juraguá plant, as it used graphite rather than pressurised water to moderate the reactor core. At that, the Cuban reactors would have containment buildings. On the other hand, two plants with pressurised-water reactors were already operating at Turkey Point and Saint Lucie in Florida. In the southern states of Tennessee, the Carolinas, Mississippi, Alabama, Georgia, and Florida, 35 plants were already in active use. Despite this, Fidelito argued, only Juraguá was unfairly designated a possible nuclear hazard.\textsuperscript{89}

\textit{The Ciudad Nuclear}

While the nuclear programme epitomised Cuba’s efforts of industrialisation, it also had specific urban form. Just east of the reactor construction site, the Cuban government developed a new housing zone as part of the project (Figure 2). Initially, construction workers, engineers, and welders lived in the Ciudad Nuclear. Once the reactors were operative, the ‘city’ would house

\textsuperscript{86} Keefer et al., \textit{Soviet-American Relations}, memos 123–6.
\textsuperscript{87} Benjamin-Alvarado, \textit{Power to the People}, p. 73.
\textsuperscript{88} Benjamin-Alvarado, \textit{Power to the People}, pp. 73–5.
power-plant workers. A workers’ town was of course no anomaly in the Cuban landscape but an integral dimension of the Cuban urbanisation process. Bateyes had been adjoining sugar centrals since colonial times, and a purpose-built ‘university city’, the Ciudad Universitaria José Antonio Echeverría (CUJE), had been constructed on the outskirts of Havana in the early 1960s to house the students of a new polytechnic university.\(^90\) In building a nuclear power plant with Soviet support, it was also logical to create a workers’ town. Soviet state architects often developed new cities next to heavy-industrial extraction sites. The Stalinist steel city Magnitogorsk is the most emblematic example; Pripyat, overlooking the reactors in Chernobyl, the most notorious.\(^91\)

**Figure 2. Workers’ Housing in the Ciudad Nuclear**

Source: G. Cederlöf, 2019

While the nuclear power plant would thrust Cuba on to a higher stage of technological development, the Ciudad Nuclear also represented a break with the past. If Cienfuegos’ urban form represented a ‘colonial space’ in the *dependista* lexicon, the Ciudad Nuclear constituted a space of and for the Revolution and its emerging nuclear modernity.\(^92\) The city was spaced out along two parallel thoroughfares, taking the shape of one quarter of an octagon. Most buildings would have five floors and were assembled using the Yugoslav IMS system. First, a prefabricated skeleton of reinforced concrete was set in place for each building; then, slabs were hoisted into place to constitute interior walls and a façade, leaving space for prefabricated stairs, balconies, and other design features. The Revolution’s first major housing project, the Ciudad Camilo Cienfuegos in Habana del Este, had been built largely with non-industrial techniques, but prefabrication was


\(^91\) Kotkin, *Magnetic Mountain*.

employed on a large scale to build the Distrito José Martí in Santiago de Cuba in the late 1960s. Prefabrication then became increasingly prevalent in the 1970s when Cubans received paid leave to work in housing construction as part of the so-called Microbrigades.\(^9\)

The Yugoslavs had named the IMS after the *Istitut za ispitivanje materijala* (Institute for the Testing of Materials) where it was developed in the 1940s and 1950s. The IMS would facilitate the reconstruction of the newly socialist but war-torn Yugoslavia with industrial precision and efficiency. Notably, the planners of New Belgrade (*Novi Beograd*) used it for housing construction as they developed this new district of the Yugoslav capital. Again, the vision of modernity’s materiality crossed the ideological divide of the Cold War. Rooted in the thought of Le Corbusier and the International Congresses of Modern Architecture (CIAM), New Belgrade engendered the same high-modernist planning ideals that were espoused by planners and politicians from Brasilia to Tashkent and Chandigarh.\(^4\) In Yugoslavia, the IMS system was soon promoted as an export asset.\(^9\) The IMS factory in Cienfuegos opened in 1978 with a reported capacity of 1,500 households per year. In the Ciudad Nuclear, the revolutionary government planned for 4,500 households.\(^9\)

Unlike the city plan for Cienfuegos, the Ciudad Nuclear was not constructed with a cathedral and administrative buildings as its focal points. Instead, the housing complexes congregated around a cultural centre, with a public library, bookshop, and professional theatre group. As in all Cuban revolutionary cities, the centralised infrastructures of the socialist state would be present:

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electric public lighting, aqueducts, and sewers, but also *bodegas* for the distribution of food rations, a polyclinic, a pharmacy, primary and secondary schools, a day-care centre, and a post office. The CEAC also established a polytechnic university focusing on nuclear physics and radiochemistry.\(^97\)

In the case of Magnitogorsk, Kotkin has shown how a socialist subjectivity and the embodied experience of an approaching, if fraught modernity were fashioned in the construction of this Soviet steel city.\(^98\) Representing the ideals of the Cuban Revolution, the Ciudad Nuclear constituted a built environment for modern, educated socialist citizens; indeed, an environment that would be productive of the socialist New Man. It was also an interpersonal meeting place seen to reinforce the social relations between Cuba and the CMEA countries. In 1984, for example, Fidel Castro noted that 5,500 Cubans were living in the Ciudad Nuclear, but also 188 Soviet and 82 Bulgarian engineers.\(^99\) In the shadow of the materialising reactor domes, a qualitatively new urban society was emerging. At least, so it seemed in the grand narrative of the Cuban Revolution.

*An interrupted nuclear modernity*

With the collapse of the Soviet Union, Cuba lost not only its closest political ally, but its main trading partner. Boris Yeltsin’s Russian government demanded renegotiations of the Soviet Union’s bilateral agreements, including the contracts for the Juraguá plant. In September 1992, with rain symbolically pouring from the sky, Fidel Castro announced that the nuclear programme would be suspended indefinitely.\(^100\) Cuba could no longer afford the Russian technology as they suffered from unequal exchange. At the same time, Russia required Cuba to purchase oil and sell sugar at world-market prices. From 1989 to 1993, Cuba’s imports of crude oil declined by 86 per


\(^98\) Kotkin, *Magnetic Mountain*.


cent, even as Fidel Castro declared that the country had entered a ‘special period in peacetime’.\footnote{ONE, Estadísticas energéticas en la Revolución (Havana: Oficina Nacional de Estadísticas, 2009), table 14.}
The refinery in O’Bourke still opened in 1991 but had to close again four years later due to a lack of crude supply. In and around Cuba’s sugar centrals, production grinded to a halt. Las Villas’ sugar fields lay deprived of synthetic fertilisers and pesticides, and the industrial machinery was lifeless without diesel, fuel, and lubricant oils.\footnote{Walfrido Alonso-Pippo, Caros A. Luengo, John Koehlinger, Pietro Garzone, and Giacinto Cornacchia, ‘Sugarcane Energy Use: The Case of Cuba’, Energy Policy, 36 (2008), pp. 2163–81.}

As work stopped on the nuclear reactors, the construction of the Ciudad Nuclear also ended abruptly. While people still live in the urban enclave across the bay – both Cubans and a few Russians who remained – many buildings were never finished. Left to the salty sea-winds, some are today in danger of collapse. In defence of the nuclear programme, Fidel Castro Díaz-Balart noted that approximately 1,300 Cubans had graduated as nuclear physicists from the Juraguá Electronuclear Polytechnic and Soviet universities by 1992.\footnote{Castro Díaz-Balart, Nuclear Energy, p. 292.} Yet none of them had a nuclear plant where they could put their knowledge to work. Their high-modern city, a long distance away from the Cuban capital, was falling into decay. In large numbers, Cubans from eastern and central provinces migrated to Havana during the special period in search of employment; ‘a process that mirrors migration flows in pre-revolutionary Cuba’, de la Fuente notes. When 92,000 Cubans were applying for residential status in Havana in the spring of 1997, the government banned all migration to the capital as unemployed newcomers often ended up living in ‘subhuman conditions’.\footnote{Alejandro de la Fuente, ‘Recreating Racism: Race and Discrimination in Cuba’s “Special Period”’, Socialism and Democracy, 15:1 (2001), p. 85.}

In the past decade, however, Cienfuegos has seen renewed investment. In 2007, Raúl Castro and Hugo Chávez re-inaugurated the oil refinery following extensive retrofitting, making Cienfuegos a key node in PetroCaribe. PetroCaribe has been an oil-trading bloc dominated by Venezuela and Cuba but by 2014 comprising nineteen member-states. The bloc was founded to
overcome the challenges faced by the Caribbean’s island-states, given their heavy oil-import dependence and low purchasing power on the world market – unequal exchange, in other words.105

A Cuban-Venezuelan joint-venture, Cuvenpetrol S.A., has operated the refinery, which has constituted the single largest project to have integrated the Cuban and Venezuelan national economies since the mid-2000s. In 2007, Cuban families also moved into a new residential area north of O’Bourke, named the Reparto Simón Bolívar. The Venezuelan government had donated the prefabricated buildings in the area as part of PetroCaribe’s social programmes.106 The process of socialist urbanisation found new material expression in the Reparto Simón Bolívar, again tied to a historically-specific form of energy development. The houses in Simón Bolívar were petrocasas, so-called ‘oil homes’, made from the plastic polyvinyl chloride (PVC), produced in the Venezuelan petrochemical industry to derive social benefits from the country’s oil wealth.107

Despite this upswing, Cienfuegos’ place is shifting again in the geometry of wider political-economic relations. In August 2017, the Cuban government re-nationalised the refinery, reportedly responding to Venezuela’s failure to pay for services incurred under the PetroCaribe agreement.108

Cuba has also looked for new sources of oil as the Bolivarian Revolution has entered what may be a terminal state in Venezuela. In a process parallel to PetroCaribe, then, Cienfuegos was declared a UNESCO World Heritage Site in 2005, to the benefit of the Cuban tourism industry. The city constitutes an ‘outstanding example’ of modernist urban planning on Cuba’s southern shores, the UNESCO motivation reads.109 Unsurprisingly, this motivation refers not to the concrete slabs of

the Ciudad Nuclear or the plastic walls of the Reparto Simón Bolívar but the colonial modernity of Cienfuegos’ nineteenth-century town centre. Cienfuegos is today an important stop on the circuit for Western tourists whose purchasing power allows them to seek pleasure in Cuba’s low-wage economy.

Conclusion

The rationale behind the policy for urban restructuring and centralised energy development emerged from a critique of the colonial political economy. Embedded in the pursuit of nuclear modernity, it also had distinct urban form. The Ciudad Nuclear represented a faith in infrastructural integration, centralised redistribution, and automated technology powered by oil and nuclear energy as determinants of social progress. However, Cuba’s spatio-infrastructural transformation was contingent on relations extending beyond its cities in space and time.110 Ideationally, Cienfuegos’ Cold War development was a success as long as Cuba entered into qualitatively different, equal-exchange relations with the CMEA. The government’s inability to sustain these relations suggests that Cuba’s nuclear modernity ultimately was a failure; a failure manifested in the Ciudad Nuclear and the reactor ruins in Juraguá. Despite this, Cienfuegos’ vital place in the revolutionary economy invites us to look beyond Havana and Latin America’s major cities to understand the Cold War in the region. Cienfuegos brings circulations of knowledge to light that widen the ‘geographies of theory’ in urban, energy, and Latin American studies.111 The city’s history demonstrates the significance and difficulty of realising alternative, possibly more equitable urban forms in Cuba and beyond.

110 Massey, ‘A Counterhegemonic Relationality of Place’.