CUBAN DESIGN:INGENUITY AND RESILIENCY TO SUBSIST

by

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Master of Architecture

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

CUBAN DESIGN INGENUITY & RESILIENCY TO SUBSIST

Since 1959, the Cuban people have been deprived of consumer products common elsewhere due to the political and economic condition in the island, where an everlasting lack of access to basic resources prevails. Driven by necessity, Cubans have resorted to designing creative tools and solutions to subsist, tools which implicitly reflect the history of their environment. Material culture is the sum of things, of objects in which stories are embedded. A visual catalogue of artifacts presents rich and highly charged evidence of an entire cultural history of creativity within a people. Building on previous exposés of similar types of artifacts, by conducting multi-disciplinary analyses of these fascinating hybrid creations designed out of necessity, this study brings a different perspective beyond conventional models of consumerist design. The thesis documents, examines and celebrates the ingenuity of alternative design that the Cuban people have resorted to as a response to the deficiency of resource availability. A curated selection of varying types of home-made Cuban artifacts reveals the object's association to its historical, political, economic and social context from which they emerged. Each artifact exposes not only the intelligent and resourceful nature of the Cuban people but also their everyday life's struggle. This thesis seeks to build public awareness of and interest in Cuba's post-revolution reality.



ACKNOWLEDGEMENTS

This thesis was meant to serve as an expository document of the reality of life in Cuba and the undeniable resourcefulness and creativity of the Cuban people. Over the past year, it has developed into so much more. This thesis has reminded me of my priorities, my empathy and my duty as a Cuban-Canadian to take action in the future reshaping of our island. This document marks the beginning of my involvement in a professional capacity with the re-development of Cuba throughout my career.

Rick Haldenby, thank you for being a mentor and a friend. Your guidance and unconditional support throughout this thesis gave me the confidence to believe in my ideas and the power of my work. I have the utmost admiration for you, I cannot express the absolute honour it has been for me to have had you as my Master's Thesis supervisor.

Jane Hutton, thank you for understanding my thesis to its core and guiding me towards a more indepth explanation of my work. The brilliance in your feedback has motivated me to further explore the potential of this work beyond a thesis, giving me the chance to unfold the many layers I simply could not unravel in the span of this year.

Philip Beesley, from the very first days of my thesis development you were able to engage with my vision and propel me along. Thank you for our wonderful conversations that shaped the structure of this thesis.

To my parents, words will never be able to express the gratitude, pride and admiration I have for you both. You gave us a chance at life twice, one by nature, the other through a determined and brave choice. A choice you have been upholding for the last 13 years along with all its challenges. You will always be the role models in my life.

To my friends, Mia, Shaina, Tracey and Genna, over the past 7 years your unconditional friendship and support have been fundamental every step of the way. To my new friend Iva, thank you for being the best Master's companion.

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DEDICATION

To my parents,

for instilling in me the principles and universal values that govern the person I am today.

Hay sol bueno y mar de espuma, Y arena fina, y Pilar Quiere salir a estrenar Su sombrerito de pluma.

"¡Vaya la niña divina!" Dice el padre, y le da un beso: "Vaya mi pájaro preso A buscarme arena fina."

"Yo voy con mi niña hermosa", Le dijo la madre buena: "¡No te manches en la arena Los zapaticos de rosa!"

Fueron las dos al jardín Por la calle del laurel: La madre cogió un clavel Y Pilar cogió un jazmín.

Ella va de todo juego, Con aro, y balde, y paleta: El balde es color violeta El aro es color de fuego.

Vienen a verlas pasar: Nadie quiere verlas ir: La madre se echa a reír, Y un viejo se echa a llorar.

El aire fresco despeina A Pilar, que viene y va Muy oronda: "¡Di, mamá! ¿Tú sabes qué cosa es reina?

Y por si vuelven de noche De la orilla de la mar, Para la madre y Pilar Manda luego el padre el coche.

Está la playa muy linda: Todo el mundo está en la playa: Lleva espejuelos el aya De la francesa Florinda.

Está Alberto, el militar Que salió en la procesión Con tricornio y con bastón, Echando un bote a la mar.

¡Y qué mala, Magdalena Con tantas cintas y lazos, A la muñeca sin brazos Enterrándola en la arena!

Conversan allá en las sillas, Sentadas con los señores, Las señoras, como flores, Debajo de las sombrillas. Pero está con estos modos Tan serios, muy triste el mar: ¡Lo alegre es allá, al doblar, En la barranca de todos!

Dicen que suenan las olas Mejor allá en la barranca, Y que la arena es muy blanca Donde están las niñas solas.

Pilar corre a su mamá: "¡Mamá, yo voy a ser buena: Déjame ir sola a la arena: Allá, tú me ves, allá!"

"¡Esta niña caprichosa! No hay tarde que no me enojes: Anda, pero no te mojes Los zapaticos de rosa."

Le llega a los pies la espuma: Gritan alegres las dos: Y se va, diciendo adiós, La del sombrero de pluma

¡Se va allá, donde ¡muy lejos! Las aguas son más salobres, Donde se sientan los pobres, Donde se sientan los viejos!

Se fue la niña a jugar, La espuma blanca bajó, Y pasó el tiempo, y pasó Un áquila por el mar.

Y cuando el sol se ponía Detrás de un monte dorado, Un sombrerito callado Por las arenas venía.

Trabaja mucho, trabaja Para andar: ¿qué es lo que tiene Pilar que anda así, que viene Con la cabecita baja?

Bien sabe la madre hermosa Por qué le cuesta el andar: "¿Y los zapatos, Pilar, Los zapaticos de rosa?

"¡Ah, loca! ¿en dónde estarán? ¡Di dónde, Pilar!" "Señora", Dice una mujer que llora: "¡Están conmigo: aguí están!

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"Yo tengo una niña enferma Que llora en el cuarto oscuro Y la traigo al aire puro A ver el sol, y a que duerma. "Anoche soñó, soñó Con el cielo, y oyó un canto: Me dio miedo, me dio espanto, Y la traje, y se durmió.

"Con sus dos brazos menudos Estaba como abrazando; Y yo mirando, mirando Sus piececitos desnudos.

"Me llegó al cuerpo la espuma, Alcé los ojos, y vi Esta niña frente a mí Con su sombrero de pluma.

"¡Se parece a los retratos Tu niña!" dijo: "¿Es de cera? ¿Quiere jugar? ¡si quisiera!... ¿Y por qué está sin zapatos?"

"Mira: ¡la mano le abrasa, Y tiene los pies tan fríos! ¡Oh, toma, toma los míos: Yo tengo más en mi casa!"

"No sé bien, señora hermosa, Lo que sucedió después: ¡Le vi a mi hijita en los pies Los zapaticos de rosa!"

Se vio sacar los pañuelos A una rusa y a una inglesa; El aya de la francesa Se quitó los espejuelos.

Abrió la madre los brazos: Se echó Pilar en su pecho, Y sacó el traje deshecho, Sin adornos y sin lazos.

Todo lo quiere saber De la enferma la señora: ¡No quiere saber que llora De pobreza una mujer!

"¡Sí, Pilar, dáselo! ¡y eso También! ¡tu manta! ¡tu anillo!" Y ella le dio su bolsillo, Le dio el clavel, le dio un beso.

Vuelven calladas de noche A su casa del jardín: Y Pilar va en el cojín De la derecha del coche.

Y dice una mariposa Que vio desde su rosal Guardados en un cristal Los zapaticos de rosa.

José Martí

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The intrinsic nature of our existence can be captured through the seemingly insignificant things that accumulate to create our history. Objects allow us to see into the past or to the censored-present, not through the filter of official history or ideology, but rather by looking at direct human interaction with the material world and the capacity to create dwelling spaces and the devices needed to inhabit them. In Cuba, where freedom of speech is a mythical liberty and the government manipulates its global image, the truth that lies within everyday objects is more telling than any other means of communication.

In studying material culture theory Archeologists examine artifacts, Sociologists analyze the functioning of societies, Historians research and teach them. As an Architect (in the making), I explore the stories archived within Cuban retrofitted buildings, homemade objects and the components of their product design. In order to demonstrate the rich charged evidence of an entire cultural history of creativity within the Cuban people I created a visual catalogue of their various objects, tools and building typologies. Due to the communist island's conflictive political relations, there is an everlasting lack of resources including but not limited to foods, medicines, tools, materials, goods, vehicles, housing, transportation and infrastructure.² This deficiency of resources affects nearly every aspect of citizens' lives encompassing all disciplines, industries and fields. Therefore, in order to survive their everyday lives, Cubans have had to overcome this imposed necessity by means of critical thinking, creativity and alternative design solutions. Becoming an astonishing society of self-sufficient, ingenious, creative doers.

While popular curiosity has sparked interest in explorations of Cuban inventions, the documentation and study of these is very limited. Due to the high political risk and legal implications of exposing the island's shameful reality, most national journalists and historians shy away from the topic. On the other hand, foreign researchers have a very limited access to the Cuban reality as the government controls the information and media published publicly while also censoring nationals.³ Thus, previous literature has mostly served as superficial imagery for entertainment consumption. Some select works have claimed more bold, intentional stands through provocative installations yet leaving the public to interpret the implicit messages stored within. ⁴ Therefore, I took on the challenge of creating new perspectives for this topic of fascinating Cuban hybrid creations. I wanted the catalogue I created to go further than a collection of photographs of objects. I wanted to fearlessly recount the stories implied within the objects and their components. In the world of art, often the responsibility for experiencing artwork is handed to the beholder, where they become an active participant. However, in the analysis of artifacts said ambiguity would be a disservice. I firmly expose through written word and drawings the undeniable realities that each object carries and represents; opening the door to difficult topics which in turn allow the reader further selfspeculation.

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[&]quot;Politics, Art and Dissent in Post-Fidel Cuba." Electronic Thesis or Dissertation, Ohio University, 2020

The alignment of my thesis with surrounding world events propelled me to consider alternative forms of academic research and access to information. Originally, I had intended to conduct a self-directed journalistic trip to the island where I would document, photograph and interview home-made objects and their creators. I imagined following traditional archeological research strategies, trying to find artifacts within specific disciplines which I could later analyze and group into categories. Although the research trip was not a possibility for my thesis investigation I arrived to an unexpectedly wonderful alternative. I discovered art historians Gabriela Lavoy and Jorge Lavoy whom had recently conducted a comparable journalistic documentation of Cuban inventions in 2018. The Lavoy's, as Florida-based Cuban historians had recently culminated an exhibition at the CADE Museum for Creativity and Invention in Gainesville, which temporarily showcased their installation of Cuban artifacts. They immediately welcomed my interest on their research library to further analyze their work, as they were not personally planning on expanding their study. I was able to use their raw research to deconstruct and analyze the artifacts through a new technical lens in the permanent medium of a thesis. Thus, most of the artifacts presented in my catalogue were originally documented by Jorge Lavoy, as noted on the figure's sources.

Their selfless, open cooperation reflects the importance of collaborating across disciplines with the shared goal to create new knowledge, expanding on previous research efforts to dissect information through new lenses. Having access to their raw footage, photographs and interview notes allowed me to carry on my vision while expanding the scope of theirs. Through Ms. Lavoy I was put in contact with Ernesto Oroza, a Miami-based Cuban architect. Unlike the Lavoy's brief curatorial adventure, Oroza has focused a great deal of his career towards the documentation of Cuban inventions. Although his work, while fascinating, is not easily accessible to popular audiences. I found this to be another great resource for my thesis research as there was untapped potential to be dissected and analyzed. Ernesto Oroza's artifact photographs are the second major contributing resource to my thesis catalogue, as noted on the figure's sources.

METHODOLOGY

Once I had found the sources for my artifact library, I had to design an imaginative narrative to create a compelling catalogue. Anthropologist Dr. James Deetz wrote an influential book on material culture "In Small Things Forgotten: The Archeology of Early American Life". As inferred from the title, Deetz presents the idea that small objects play big parts in an individual's life and should therefore be strongly considered in an archeological investigation. In the book he also argues for the value of architecture (specifically that of vernacular nature) as vital evidence of historical investigations. Vernacular architecture as a type of local construction using materials and methods specific to its regions houses within it an archive of its material history. I found

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this to be relevant in my expository study of Cuban reality through the built and material world and thus I used the technique of scales to unfold my research.

Resembling a Russian doll set, the thesis slowly unravels in scale from architecture, to mechanics, to product design, to components and finally, techniques. I wanted to give the artifacts a sense of place and life rather than present them as disembodied numbered items. Therefore, I created a fictional space for them, an axonometric filled with authentic Cuban scenes familiar to nationals yet curiously playful to foreigners. The axonometric illustrates an artifact of its own, a Cuban Solar. The Solar phenomenon is defined by typical vernacular building typologies which emerged as a result of the national housing deficiency. Cubans retrofitted traditional single-family colonial villas into multifamily residential dwellings, readapting its programs and spaces. While the three-dimensional axonometric drawing of the Solar is based from a survey of a real Solar in Havana, the scenes within it are product of my experienced imagination. Each scene serves as an opening chapter to the artifacts, often containing more than one per scene. In developing the detailed drawings, I came to the realization of the power an illustration holds. Graphic visuals are important forms of communications, especially in the discipline of architecture. All of the sudden I began to value the opening scenes as a narrative tool to implicitly illustrate certain aspects about Cuban's everyday lives which had not been present in the selected artifacts.

After setting the stage, it was time for the artifacts. Through them I document, examine and celebrate the ingenuity of Cuban alternative design. The artifacts range in size, complexity, discipline, or even customizability and uniqueness, each exposing the cultural context in which they have been ingeniously created. For the most part, the artifact analyses are three-fold. First, I present photographs of the object followed by a general description of its purpose and functions. Second, I graphically deconstruct the objects to each of its core components through a technical approach of exploded diagrams, legitimizing the inventions as intelligent product designs. Third, I expand on the relevance of the artifact, its components or the originating objects from which parts were taken from and their role in Cuban society. This last section exposes the most relevance to the artifact's material history. While the three-fold equation is mostly followed, certain artifacts call for creative deviations with analyses including exploded diagrams, technical diagrams, abstract provocative graphics, and even fictional lineage tracing diagrams. Capturing the reader's curiosity through straightforward yet captivatingly diverse examinations.

The catalogue, analyzed as a whole, can be understood as a beautifully curated unveiling of the greater sociological reality of post-revolutionary Cuban culture and a celebration of its resiliency.

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Staten, Clifford L. "The History of Cuba." Santa Barbara, CA: Greenwood, an Imprint of ABC-CLIO, LLC,

Niglio, Olimpia. "Geometry and Genius Loci: Battista Antonelli's Fortifications in Havana." Nexus Netw J no. 16 (2014): 723-735, https:// doi.org/10.1007/s00004-014-0202-z.

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HISTORICAL CONTEXT

In order to understand the necessity from which the creative inventions derive, it is imperative to have a basic knowledge of Cuban history and the influences on its culture. Cuba, the largest island in the Caribbean, was originally occupied by three main aboriginal groups, the Tainos, Siboneys and Guanahatabeyes. These first occupants were obbliterated following the arrival and settlement of Spanish conquistador Christopher Columbus in 1492.8 Hence, few traces of aboriginal influence remain present in Cuba's culture. Cuba became a Spanish Colony for over 400 years, these centuries of colonial occupation left their mark on the island's culture, architecture and traditions. At the same time the slave trade brought Africans who made up a significant portion of the population. Cubans mainly becoming a mix of physical attributes. cultural practices and religious beliefs between white Colonial Spaniards and black enslaved Africans.

The geographical position of Cuba was of great importance, leading the island to be nicknamed 'the key of the gulf'. It became the go-to stop for ships traveling between Europe and the New World. Most in-coming fleets from Europe would stop at the port of Havana to replenish after long weeks crossing the Atlantic Ocean, and vice versa it would be the final destination prior to returning from the Americas to import all the goods acquired back to Europe. This unquestionably fueled the city of Havana's economy, wealth and military presence. Affluent merchants settled within the city wall and fortifications were built around the bay, forming the Old Havana we know today. Late 16th century renaissance military fortifications, 18th century baroque architecture, along with its predecessor movement of 19th century neoclassical architecture are very much present in the current urban fabric of the country's capital. 9 Similarly, 19th-20th century furniture still remains in Havana today, where such deteriorating antiques serve of use in lieu of new products being available.

Although there is important history behind the many decades of wars and attempts at Cuban independence from Spanish Colony, the focus of this historical context is to understand the main historical phases influencing the artifacts to follow. Thus, the history must be simplified to mere milestones. In 1898 the Spanish colonial occupation finally ended. Coinciding with the Spanish-American war of 1895-1898, Cuba received military and financial support from the U.S. which resulted in its independence from Spain. 10 However, the country was far from being independent, it now had a new foreign political presence. The U.S. implemented rigorous conditions over the island's political and military power. During the early 20th century, the island's enviable weather, beaches and architecture made it a unique touristic destination, it became the epicenter of entertainment, vice and wealth of the Caribbean. An immense building boom occurred, with a particular focus on civil works and commercial hotel architecture. This led to the iconic Art Nouveau, Art Deco

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NATIVE OCCUPANCY

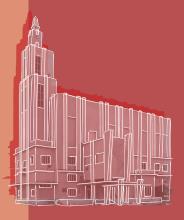




SPANISH COLONY

AMERICAN OCCUPANCY





COMMUNIST REGIME



and Eclectic movements which spanned across the capital's fabric. Along with development came corruption, as was the nature of the exploitational capitalist model of the time. Even though Cuba was flourishing in comparison to the rest of Latin America, Cubans had the U.S. as a frame of reference rather than 3rd world Latin American countries. Dissatisfaction and frustrations grew at the economic gap between Cuba and the US. Investments were focused on sectors of revenue: tourism, entertainment and agriculture. The island's social class imbalance grew to a gross inequality. While the capital was booming with casinos, hotels, and all sorts of luxuries available to foreign visitors, the majority of Cuban citizens were growing ever so poor. Cuban's illiteracy numbers were rising and health care and education were unattainable for many. In 1940, while receiving military, financial and logistical support form the US, the presiding leader in Cuba revoked most political liberties, violated human rights, systematically profited from the exploitation of the nation's commercial interests, and even murdered hundreds of opposing protestors.

All these injustices, inequalities and violations gave way to one of the defining events of the modern era: the Cuban Revolution. Claiming to follow initial ideals for common middle class with no social hierarchy, Castro's revolution gained large national support. In 1959, the communist group was triumphant in its government coup and overthrew the US-backed military dictatorship from the island. A year later, in 1960, the United States responded with a powerful bullying strategy, the trading embargo. 13 It effectively banned all Americans from carrying out business or investments in or with Cuba. Any new American made products, brands, even American pop culture became extinct from the island post 1960, leaving only a trace of vintage American products frozen in time. The embargo also extended its reach internationally, threatening to penalize any foreign American allies were they to engage in business with the communist Cuban government. This was the U.S.'s tactic to suffocate the Cuban government, closing its access to sources of imported and exported goods including basic items such as food, medicine and oil. Unfortunately, 62 years later, this embargo has proven to have failed its purpose, the communist government remains in power and the only victims who have suffered from the strategy are the Cuban citizens themselves. Nevertheless, once the embargo was imposed Cuba had to resort to new allies to survive. At the time there was a clear ally with a mutually shared opposition to the US, the Soviet Union. Thus, began the Cuban-USSR partnership, which resulted in an immense influence on post-revolution Cuba. 14 As the communist government began reforms, new developments expanded throughout the island. Hospitals, universities, schools and social housing were mass produced in pre-fabricated soviet style architecture. Given the island's main trading partners were those of the Soviet Union, Cuban households began to increasingly see soviet tools, machines and products influence a great part of their everyday life.

In 1991, the collapse of the Soviet Union had an incredibly detrimental impact on life in Cuba. As the island was exclusively dependent on its ties to

7

the USSR for economic survival it then entered its extended period of economic crisis known as "the Special Period". 15 The country collapsed as it could not sustain its economy. This period lasted nearly nine years -although it is disputable whether it has ever ended. It led to the greatest hardships and obstacles known to Cubans. Hunger overcame every household, access to essential resources such as water and electricity became scarce. The government imposed resource-saving measures such as eight hour long city-wide blackouts in order to preserve the little oil they had. Reduction in domestic consumption of oil went on to last for 24 months. A general breakdown in transportation, food and medicine shortages, as well as the paralysis of industrial and agricultural systems defined the Special Period in Cuba. 16 This was the time where Cuban inventions arose. Cubans had to get creative, guick, to be able to survive such drastic times. From fashioning their own tools, to creating alternative gastronomy recipes, to adapting the way they lived, the islanders unknowingly became a culture of innovators out of necessity. Generations of Cubans to follow would be forced to learn to think outside the box and use what they had at their disposal to serve as a solution. Leaving these creations to be observed as witty, comical and ingenious to be commended.

Cuba's economy in the pandemic dominated present continues to be as critical as it was during the Special Period, the country's economy continues to decline and a lack of resources prevails as the trading Embargo remains enforced. The housing deficit increases as buildings are not maintained, restored, or newly developed. The once world-renowned schools and hospitals are falling apart, lacking basic equipment for safe hygienic procedures. Civil infrastructure continues to degrade from roads, to sewage systems, to public transit. People wear decades old clothes and shoes while using products which have become obsolete to the rest of the world in lieu of access to new ones. The majority of the country suffers in one way or another and most can only subsist with the financial assistance of family members overseas. However, due to the trading embargo and the Regime's corruption oftentimes regardless of having the means to purchase a good, there simply is none to be found in the island. Therefore, the Cuban's resourceful nature remains essential to their ability to continue to carry out their daily lives.

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2021).

¹⁵Plinio Montalván, George.
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¹⁶Pérez-López, Jorge F.,
and Lorena Murillo S.
"El Interminable Periodo
Especial De La Economía
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16, 2021. http://www.jstor.
org/7739198.

HAVANA'S

When we think of Havana today, we picture the beautiful aging architecture, the old American cars and a sense of celebration. Havana's wonderful range of architectural styles include 16th century fortifications, 17th-19th century colonial villas, 20th century art deco and nouveau, Soviet architecture, 21st century contemporary commercial architecture and everything in between. Old Havana is the historic center of the city, containing the core of the original colonial city of Havana. In 1982, Old Havana was inscribed as a UNESCO World Heritage Site, which launched a campaign to restore the authentic character of its buildings. 17 These restored colonial quarters, boutique hotels, shops and restaurants became a focus for tourists worldwide, attracting millions yearly. The beauty and grandness reflected within Old Havana is an undeniable feat. However, foreigners who visit the island are often oblivious to the veiled reality of authentic Cuban's lives. The Government immensely prioritizes efforts towards the preservation of these tourist areas simply due to the financial profit they gain as well as upholding appearances with the international community. 18 In contrast, the Government unceasingly turns a blind eye towards addressing national issues such as the housing crisis, the degenerating infrastructure, the decaying education and health care systems, etc. as these do not generate direct profit.

The housing crisis was and continues to be one of the greatest challenges in which Cubans have had to adapt in order to accommodate the deficit. Over the span of 50 years, from 1964 to 2014, Havana's population nearly doubled to 2.1 million residents. However, the urban fabric remained the same with an area of 726,75 Km.¹⁹ There were no major projects to expand the city's infrastructure, therefore the city was forced to grow inwards and upwards. This resulted in makeshift architecture. In order to accommodate the newer generations of families, Cubans self-designed new housing typologies. These included dividing their single-family houses into multi-nucleus houses within the same footprint area, as well as building additional rooms on rooftops or backyards. However, the most extreme of these new typologies was the Solar. A Cuban Solar is a building which had originally been designed as a large singlefamily occupancy dwelling and was later informally transformed, sub-divided and occupied as a multi-family apartment building by the citizens.²⁰ Much like Brazilian favelas, these Solares are typically slums with improvised interior construction from salvaged or stolen materials. However, unlike the favelas, Solares are present all throughout the city of Havana, including centric historic and tourist areas of the Capital. They are often disguised by the exterior carcass of their structure along side some of the most luxurious buildings designated to the foreign tourism market.

Centre, UNESCO World Heritage. "Old Havana and Its Fortification System." UNESCO World Heritage Centre. Accessed June 15, 2021. https://whc.unesco.org/ en/list/204/.

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La Habana, 2006.

"Census Plan Maestro: National Office of Statistics and Information." Population Density and Dwellings, 2015.

Chailloux Carmona, Juan M. "Los Horrores Del Solar Habanero: Síntesis Histórica De La Vivienda Popular." La Habana: Editorial de Ciencias Sociales, 2005.



Fig 02. Cultural Centre, Casa de los Condes de Jaruco, Havana



Fig 03. Museum, Palacio de los Capitanes Generales, Havana



Fig 04. Hotel Santa Isabel, Havana



Fig 05. Cultural Centre, Casa del Marques de Arcos, Havana



Fig 06. Colonial Art Museum, Havana



Fig 07. Restaurant, Casa del Marques de Aguas Claras, Havana



Fig 08. Hotel Florida, Havana



Fig 09. Hostal Valencia, Havana

These images represent the typical architecture tourists experience and interact with during their visit. As they meander the tightly woven cobblestone streets, they are fascinated with every corner they turn. Oftentimes one will innocently walk through wooden scaffolding propping up a building's entire façade. Subconsciously, through first world reasoning instinct one might assume this to be an uninhabited building awaiting its glorious restoration or merciful demolition. Regrettably, those decaying walls and crumbling arches are in fact the structure which houses multiple Cuban families.

Havana city has thousands of Solares which exist undocumented and unaccounted for. Solares can range from having as few as three families to as many as over 30 family nuclei within the one building. Many Solares in Havana were originally colonial villas or palaces which were abandoned due to structural deterioration. Thus, Solares show clear architectural features such as central courtyards, galleries, high ceilings and archways. While one may find beauty in the idea of inhabiting these vintage buildings, we must be aware of the realistic dangers that come from calling a Solar one's home. The living conditions of the Cuban Solar are subpar to any modern building standard. There is limited access to adequate sanitary facilities, electricity or plumbing. Amenities such as bathrooms, kitchens or living areas are often shared between multiple different families as communal spaces.²¹ The lack of access to potable running water results in water being informally routed through leaky, rusted pipes into various containers and tanks which tend to be septic. Proper ventilation and access to natural light are also a challenge in most rooms or units in Solares due to the nature of subdividing architectural spaces into multiple interior programs. These poorly designed spaces are typically overcrowded, leaving an entire family to sleep in one same room. The overall structural conditions of the buildings are in dangerously deteriorating states which continuously collapse unexpectedly, resulting in injury and deaths. Overall, the living conditions in a Cuban Solar lead to extremely concerning threats to public health and safety.

In 1941, Juan Manuel Chailloux Cardona, a Political Science scholar wrote a thesis titled: *The Horrors of Havana's Solares*. He conducted an investigation of 50 Solares in Havana which quantified evidence of the environments of these Solares. At the time there was a calculated total of over 2000 Solares in Havana, with an average of 28 units per Solar, this totaled to over 50,000 families living in these building typologies. From the 50-solar study, they found an average ratio of 1 toilet for every 36 residents. Data of this nature truly exposed the horrors in which people were left neglected to live in. Unfortunately, in the present day there are limited additional studies of this kind of the past dozen decades due to the legal ramifications imposed by

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the Government for exposing or criticizing their failed system. Regardless of political efforts to contain this reality, it is impossible to deny what is exhibited in plain sight.

Although it may seem senseless to find a silver lining from the adversity of Solar living, there are actually wonderful lessons to be learned and implemented in future social housing efforts. Bonded by misery, necessity and daily struggles, the community within a Solar can be some of the kindest and most neighborly throughout the island. There is a shared sense of responsibility to help one another, to be respectful and cordial. The undesired communal situations of shared bathrooms or kitchens -while mostly being a major inconvenience- can lead to very humane interactions between the residents. Even preparing for a natural disaster such as a storm or hurricane leads to communal solidarity. This culture of collaboration is nurtured throughout the country, in true Communist spirit there is a general equality in social class. However, in Cuba's case, it is the furthest from a Communist utopia, but rather a social class equality of struggle, necessity and oppression. Due to this traumatic bond, Cubans lead very neighborly lives, with a 'one hand washes the other' attitude. This culture is even more evident when analyzing co-habitants of Solares. Therefore, when Architects and planner address the housing crisis in the future, we must acknowledge the authentic Cuban communal spirit and integrate it into new design solutions.

A very important distinction of Cuban Solares from traditional slums are the residents themselves. Typically, slums are known to be low-income communities, with marginalized and deviant members of society with high crime and poverty rates. However, most Solar residents have completed at least a 9th grade education and many of them are practicing professionals such as educators, medical professionals, technicians, post-secondary students and retired elders. They do tend to be in a lower poverty bracket, perhaps with no relatives overseas to help them financially survive. Therefore, although from its appearance a Solar may seem like a dangerous place, it is no different than most other homes in the neighborhood. Children play with their school friends and similarly adults interact with one another regardless of their residence in a Solar.

The following images serve as a first insight into the nature of these alternative building typologies.

²¹ Chailloux, "Los Horrores Del Solar Habanero", 117.

²² Chailloux, "Los Horrores Del Solar Habanero", 127.



Fig 10. Cuban Solar A



17

Fig 11. Cuban Solar B



Fig 12. Cuban Solar C



Fig 13. Cuban Solar, Luz y Compostela



Fig 14. Solar Habana y Amargura l



Fig 15. Solar in Havana Unkonwn

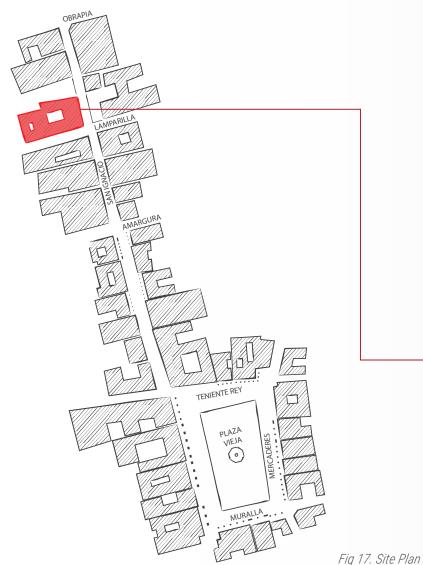


Fig 16. Solar Habana y Amargura II

It is nearly impossible to fully capture the essence of the Solar through a photograph, or to describe it with mere adjectives. One must embed themselves in everything that composes a Solar to understand how the Cuban spirit prevails, how it rises strong and united; painting over the misery with a coat of joy and optimism.

Nevertheless, now that we have a better grasp of what a Cuban Solar looks like, we can proceed to dissect and understand it by its technical composition.

24 UNESCO, "Una Experiencia Singular" The following architectural analysis is a case study of Solar San Ignacio 214, the data presented was gathered and personally shared by architects Alberto Montero and Luis Montano in their thesis development "Creative Economies: Historic Centres". This Solar is located in the historic center of Old Havana, blocks away from one of the most visited tourist areas, the Old Square. The site's architectural style is typical Spanish Colonial, composed of narrow cobblestone streetscapes delineated by two to three story buildings with central courtyards, galleries and colonnades. Due to this Solar's centric location in a touristic zone, it underwent an exterior cosmetic restoration by the architecture department of the Historian's Office of the City. However, the interior and structural state of the building, in which citizens reside, was left in its deteriorated and hazardous condition. The building was originally an 18th century Spanish Colonial Villa, through the decades it was passed down to generations and sold between wealthy Spanish pioneers and businessmen.



CUBA **HAVANA** OLD HAVANA Fig 18. Map of Havana

Today, this Solar serves as a residential dwelling for 30 families, with a total of 85 residents. These residents consist of 15 minors, 20 elders and 50 adults. The building was gradually self-adapted into a Solar as the housing crisis worsened. The alterations perceived include enclosing and occupying the galleries, building inwards towards the courtyard, building mezzanines, as well as building new units on the rooftop. The introduction of the mezzanine or 'barbacoa' as it is commonly known in the island, was wildly popular as it dramatically increases the available square footage of a unit. Traditional colonial buildings were designed with generous floor-to-ceiling heights to allow air flow as well as access to natural light. These +4m high levels became ideal for the addition of sub-levels where the bedrooms could be allocated, maximizing the total floor area of the unit. Other typical characteristics of the colonial villa may not seem apparent to the untrained eye, as they have been buried under a clutter of mismatched additions. However, the structural symmetry, the iconic archways and the central galleries are some features which remain apparent



25 Montero, "Creative Economies in Historic Centres."

Fig 19. San Ignacio 214 - Facade



Fig 20. San Ignacio 214 - Gallery



Fig 21. San Ignacio 214 - Courtyard

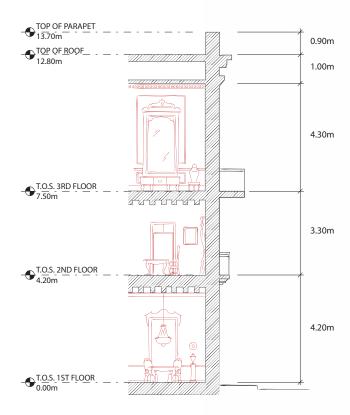


Fig 22. San Ignacio 214 - Foyer

within this Solar. Similarly, traces of original elements such as iron railings, marble stairs and stained-glass windows can still be recognized.

The following side by side building sections and plans demonstrate the clear distinction between the original Villa and the current retrofitted Solar. The Solar's habitable area increased over a third while maintaining the original building foot print by occupying spaces like galleries, portions of the central courtyard, rooftops and adding mezzanines. The spaces were occupied in completely different ways from their originally intended programs. What once may have been a grand salon, stands today as a multi-bedroom family unit with low ceiling heights and dark natural lighting qualities from the addition of mezzanines.

ORIGINAL XVIII C. VILLA BUILDING SECTION



25

Fig 23. Original Building Section

The Solar is a harmoniously chaotic composition of dozens of units all self-constructed from salvaged materials alien to the original architecture which it unapologetically invades as it assembles into a new world within the structural shell of what once was. Yet as curiously ingenious as Solares can be, it is the tools, artifacts and contraptions housed within them that hold the greatest merit of Cuban innovations. Even though ingenious artifacts can be found nearly in every household in the island, their common cause for existence is necessity itself. Thus, making Solares central reservoirs in which these fascinating artifacts are created and used daily.

RETROFITTED SOLAR BUILDING SECTION

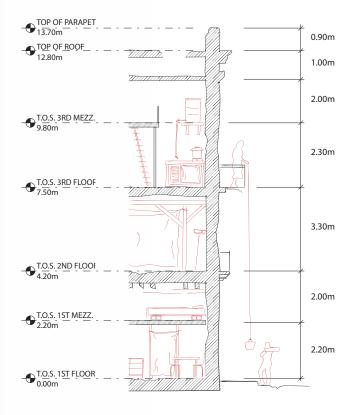


Fig 24. Solar Building Section

ORIGINAL XVIII C. VILLA FIRST FLOOR PLAN

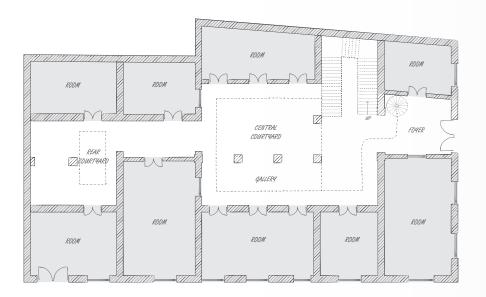


Fig 25. Original First Floor Plan

HABITABL	E AREA	CIRCULATION
FLOOR 1:	380 m²	220 m²
FLOOR 2:	396 m²	204 m²
FLOOR 3:	336 m²	264 m²
FLOOR 4:	96 m²	

TOTAL HABITABLE AREA: 1208 m²

TOTAL BUILDING AREA: 1896 m²
BUILDING FOOT PRINT: 600 m²

RETROFITTED SOLAR FIRST FLOOR PLAN

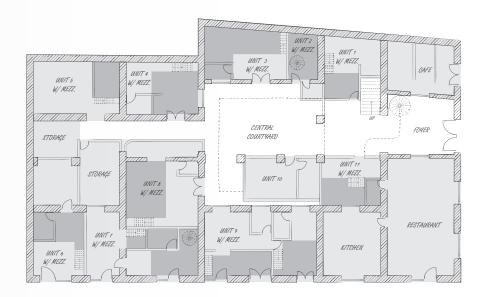


Fig 26. Solar First Floor Plan

HABITABLE AREA	CIRCULATION
FLOOR 1: 481 m ² + 112 m ² (A 36%)	119 m² (▼46%)
FLOOR 2: 419 m ² + 27 m ²	181 m²
FLOOR 3: 468 m ² + 107 m ²	132 m²
FLOOR 4: 135 m ² + 4 m ²	

TOTAL HABITABLE AREA: 1753 m² (▲31%)

TOTAL BUILDING AREA: 2185 m² (▲13%) BUILDING FOOT PRINT: 600 m² (0%)

ORIGINAL XVIII C. VILLA SECOND FLOOR PLAN

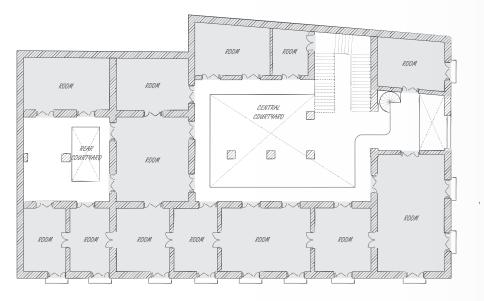


Fig 27. Original Second Floor Plan

HABITABLE AREA	CIRCULATION
FLOOR 1: 380 m ²	220 m²
FLOOR 2: 396 m ²	204 m²
FLOOR 3: 336 m ²	264 m²
FLOOR 4: 96 m ²	

29

TOTAL HABITABLE AREA: 1208 m²

TOTAL BUILDING AREA: 1896 m²
BUILDING FOOT PRINT: 600 m²

RETROFITTED SOLAR SECOND FLOOR PLAN

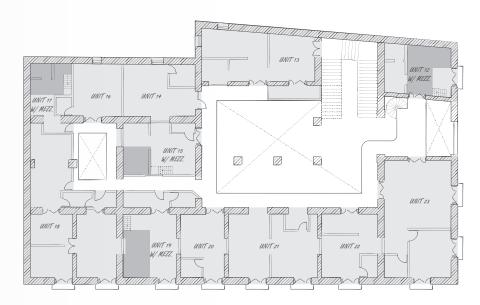


Fig 28. Solar Second Floor Plan

HABITABLE AREA	CIRCULATION
FLOOR 1: 481 m ² + 112 m ²	119 m²
FLOOR 2: 419 m ² + 27 m ² (▲11%)	181 m² (▼11%)
FLOOR 3: 468 m ² + 107 m ²	132 m²
FLOOR 4: 135 m ² + 4 m ²	

TOTAL HABITABLE AREA: 1753 m² (▲31%)

TOTAL BUILDING AREA: 2185 m² (▲13%) BUILDING FOOT PRINT: 600 m² (0%)

ORIGINAL XVIII C. VILLA THIRD FLOOR PLAN

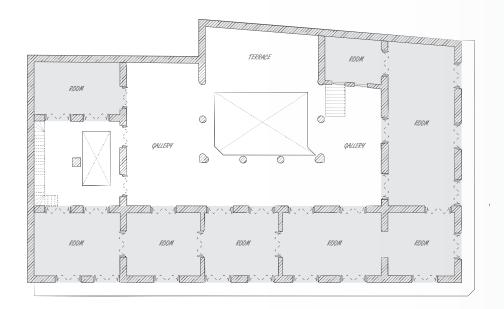


Fig 29. Original Third Floor Plan

HABITABLE AREA		CIRCULATION
FLOOR 1: 3	80 m²	220 m²
FLOOR 2: 3	96 m²	204 m²
FLOOR 3: 3	36 m²	264 m²
FLOOR 4:	96 m²	

31

TOTAL HABITABLE AREA: 1208 m²

TOTAL BUILDING AREA: 1896 m²
BUILDING FOOT PRINT: 600 m²

RETROFITTED SOLAR THIRD FLOOR PLAN

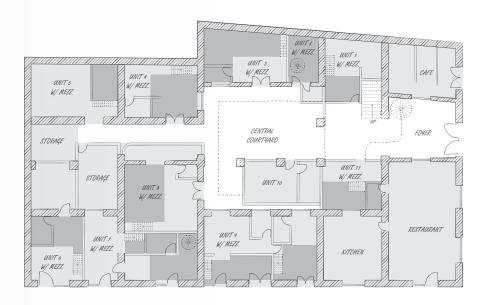


Fig 30. Solar Third Floor Plan

HABITABLE AREA	CIRCULATION
FLOOR 1: 481 m ² + 112 m ²	119 m²
FLOOR 2: 419 m ² + 27 m ²	181 m²
FLOOR 3: 468 m ² + 107 m ² (▲42%)	132 m² (▼50%)
FLOOR 4: 135 m ² + 4 m ²	

32

TOTAL HABITABLE AREA: 1753 m² (▲31%)

TOTAL BUILDING AREA: 2185 m² (▲13%) BUILDING FOOT PRINT: 600 m² (0%)

ORIGINAL XVIII C. VILLA FOURTH FLOOR PLAN

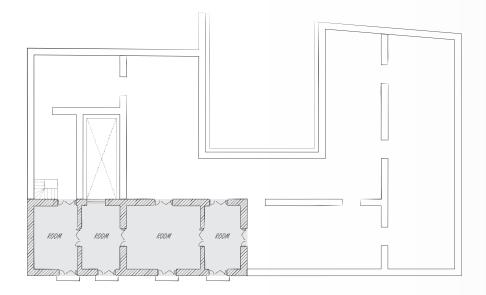


Fig 31. Original Fourth Floor Plan

HABITABLE AREA	CIRCULATION
FLOOR 1: 380 m ²	220 m²
FLOOR 2: 396 m ²	204 m²
FLOOR 3: 336 m ²	264 m²
FLOOR 4: 96 m ²	

33

TOTAL HABITABLE AREA: 1208 m²

TOTAL BUILDING AREA: 1896 m²
BUILDING FOOT PRINT: 600 m²

RETROFITTED SOLAR FOURTH FLOOR PLAN

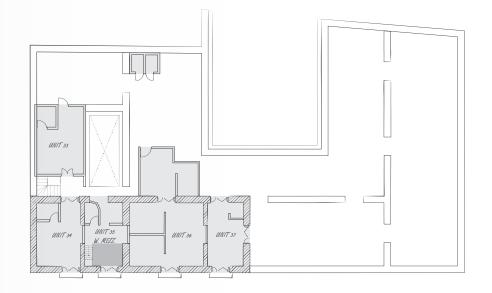


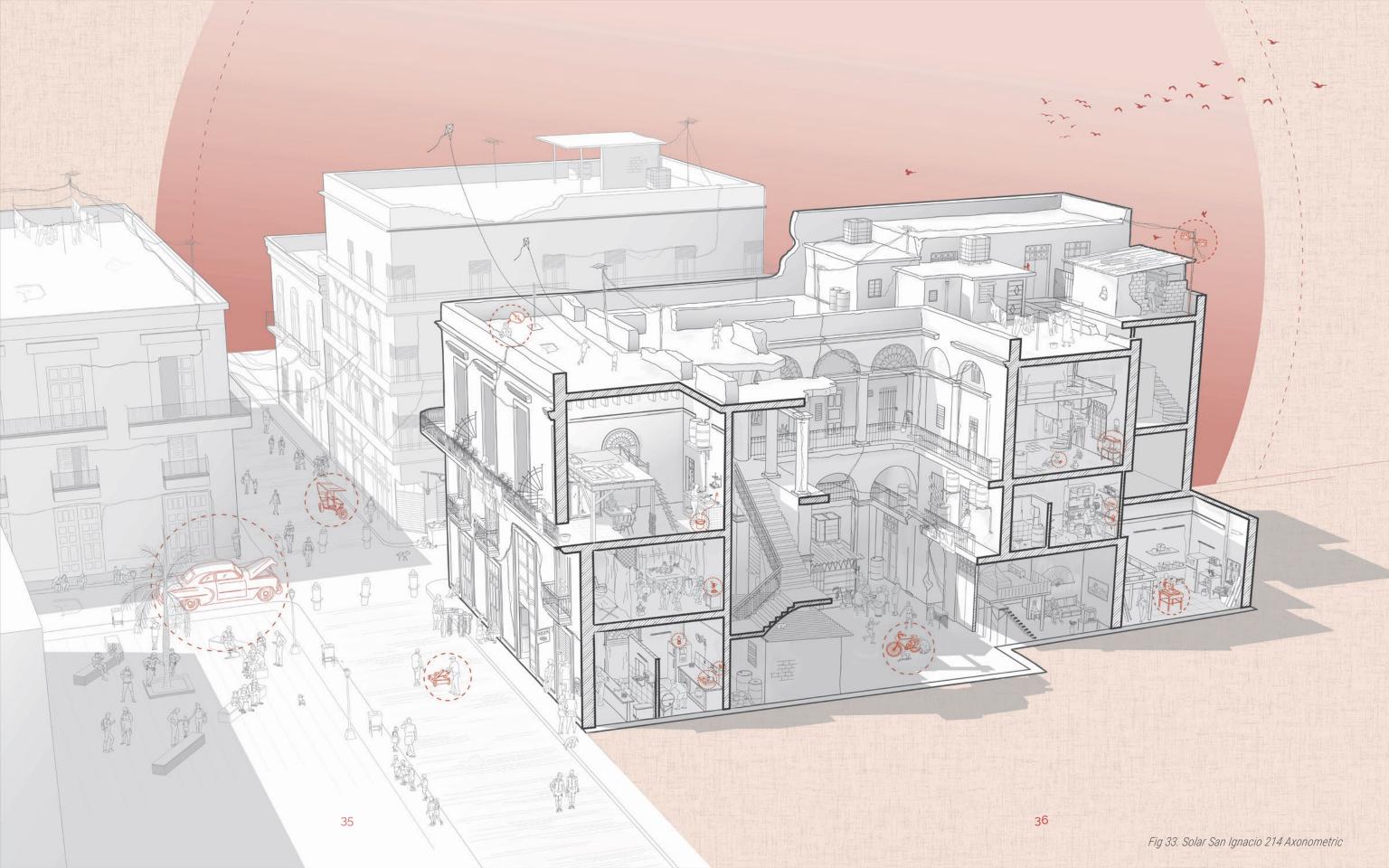
Fig 32. Solar Fourth Floor Plan

HABITABLE AREA	CIRCULATION
FLOOR 1: 481 m ² + 112 m ²	119 m²
FLOOR 2: 419 m ² + 27 m ²	181 m²
FLOOR 3: 468 m ² + 107 m ²	132 m²
FLOOR 4: 135 m ² + 4 m ² (\$\triangle 31\%)	

34

TOTAL HABITABLE AREA: 1753 m² (▲31%)

TOTAL BUILDING AREA: 2185 m² (▲13%)
BUILDING FOOT PRINT: 600 m² (0%)



Sundbo, Jon. "The

Theory of Innovation: Entrepreneurs, Technology and Strategy." Edward Elgar Publishing, 1998.

Slade, Giles. "Made to Break: Technology and Obsolescence in America. Cambridge, Massachusetts; London, England: Harvard University Press, 2006. Accessed November 11, 2020. http://www.jstor.org stable/j.ctvjhzqd7

Literature on innovation has a large variety of definitions for the term. As simply defined by theorist Everett Rogers, innovation is understood as an idea, practice or object that is perceived as new by an individual or other unit of adoption.²⁶

> "Provisionally, we can define innovation as the introduction of new elements or a new combination of old elements in industrial organizations. (...) Innovation refers to the process of bringing any new, problem solving idea into use. (...) Innovation as an industrial activity is a phenomenon that can be studied from the point of view of both economics and sociology." 27

When analyzing innovation in industrial design we must explore the concept of consumerism. The modern concept of consumerism focuses on the idea of the consumption of a steady supply of goods and services by the citizens of a given country. This drives the economic engine of a consumerist society, creating jobs and wealth. The Industrial Revolution played a major role in its spread, industries and factories were able to produce countless number of inventions and products on a mass-scale. The Industrial Revolution fundamentally changed the small-scale unique system in which goods were previously produced. The abundance of new and cheap goods meant there were many different products for people to buy, leading to a chain of consumerism and the concept of supply and demand. Since then, product design was regarded as a practice of designing, prototyping and mass-producing products for the general public. With consumerism further developing in the 20th century, uniqueness began to become obsolete. Similar goods were marketed to large groups of people, globalizing products and cultures. Another important phenomenon of consumerist societies was the introduction of the concept of planned product obsolescence. Amidst the Great Depression, manufacturers were forced to use inferior materials in manufactured goods, this led manufacturers to learn to manipulate the failure rate of materials in order to simulate faster demand.²⁸ Manufacturers learned how to exploit obsolescence, inventing not only disposable products but the concept of disposability itself, creating a scheduled simulated demand per product.

All of these factors inform the way in which we design today, they inform the materials we use, the quantities and specificities of each product depending on the targeted consumer, etc. However, Cuba entered a different phenomenon due to the imposed trading embargo. Up until 1960 Cuba was a participant of the global consumerist society, the architecture, cars and products remaining in the island circulating pre-1960 are clear evidence of this. Once the trading embargo was put in place Cuba's goods were mostly traded with the Soviet Union. The concept of modern consumerism is often associated with capitalist countries, therefore most of the goods traded between Cuba and the socialist Soviet Union did not fall under the characteristics of products manufactured for a consumerist society. Planned product obsolescence was not a marketing strategy in Soviet made products. Additionally, things such as large customization options were not a priority in Soviet made products. Much like their socialist political model, their manufacturing principles largely followed the one size fits all rule. Resulting in very similar or identical household items being used throughout the island.

The next factor playing a role in Cuban innovations today was the decline in constant supply of new products. As the Soviet Union collapsed Cuba found itself with very limited options for trading goods therefore Cubans would have to use the products already existing in the island well past their intended life span. They were also forced to become creative and modify whatever resources were available to engineer new products as needed, thus the birth of Cuban inventions.

Having to find an alternative to the conventional doctrines and formal models of industrial design, the Cuban society subconsciously turned to the practice of adhocism. As a design principle, adhocism starts with everyday improvisations, designing by trial and error, adjustment and readjustment; understanding on how we actually do things and designing based on those needs.²⁹ One thing the Cuban Revolution unquestionably succeeded in its earlier stages was educating the general population to great lengths. Although, the education system was not immune to the country's deterioration, the quality of instructors, resources and results have since plummeted. In many cases teenagers are the teachers to middle school children, and needless to mention the limited and outdated resources. However, the knowledge of elder generations prevails and trickles down maintaining a fairly advanced educated society. This level of education along with necessity results in nation-wide Cuban innovations that follow principles of mechanics, physics, chemistry, even nanotechnologies.

When comparing product design of Cuban inventions against conventional design hierarchies we find a large disconnect between the finished products. Similar to Maslow's Human Hierarchy of Needs, Steven Bradley coined the concept of Design Hierarchy of Needs where he explores the pyramid of design priorities.³⁰





2010, Steven Bradley

While most mass-produced products today meet all the levels of Bradley's pyramid of needs. Cuban creations lack levels in each product. Functionality is always met as the invention is exclusively being created out of necessity rather than whim. Reliability is certainly strived for as access to resources is scarce, therefore the creation must work and it must last. Usability becomes a luxurious concept, typically the Cuban creations are not known for their intuitive nature. There may be very specific ways to operate an item, only apparent to the creator. Proficiency is also seen as a secondary priority, oftentimes there are barely enough resources to make the design function, let alone resources to make it more proficient. Lastly we have creativity level, this is theorized as the addition of extra features, functions, customizations, etc. in the case of Cuban homemade inventions this is rarely ever a priority as the products are not designed for mass-production consumerism but rather produced as the small scale of the 'cottage industry' model.

Understanding the difference between conventional consumerist product design and post-Revolution Cuban inventions we can now further explore specific artifacts with a better appreciation for its creative genius.

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Bradley, Steven. "Designing For A Hierarchy Of Needs. Smashing Magazine. April 26, 2010. Accessed October 25, 2020. https:// www.smashingmagazine. com/2010/04/designing-for-a-

hierarchy-of-needs/

LOS EMELIN®OS

THE EMELINOS

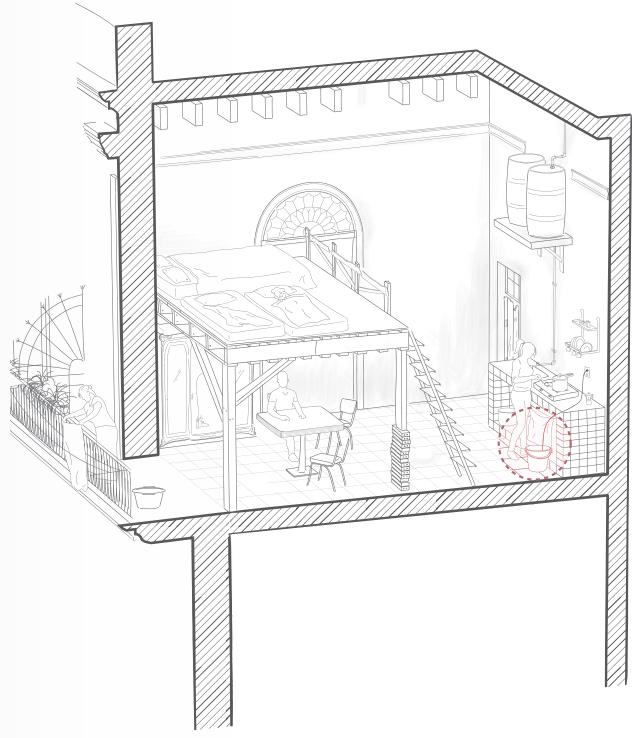




Fig 35. Electric Water Heater



Fig 36. Electric Water Heater

Homemade electric water heaters are very common household items that form part of the daily life of many Cubans. Used mostly for personal hygiene water heating.

Most routine errands and tasks in Cuba require extra steps to complete, even something as trivial as showering needs additional planning amongst the family members. Who will go first, how long will they be so they can time when to heat up the next bucket, and so on. Showering by bucket is very common as residential water pressures are unpredictable or permanently low. Cubans have invented and fashioned immersion heating devices from scraps of materials in order to shower with comfortable water temperatures. While these heaters are relatively simple in principle, it is astonishing the creativity behind different variations found throughout the island.

The way this homemade electric heater works is through a basic understanding of physics and thermodynamics. Using an electrical power source, a conduction cable, a coiled resistor and an isolating component electric heat is achieved. This is a common process where electrical energy is converted into thermal energy through Joule heating, as known as resistance. Electric current from an outlet flows through a cable to a metal coiled heating element, producing heat. Joule's first law states that the power of heating generated by an electrical conductor is proportional to the product of its resistance and the square of the current.31

 $P = I^2R$ (Power) = (Current)² x (Resistance)

The heating device is directly submerged into a bucket of water which begins to heat from direct contact with the heating element. Typical homemade immersion heaters can warm up a 5gal pail of water within 5-10 minutes. Due to the lack of more intricate temperature regulators being integrated to the device, water can often times be overly hot. Usually the pail will be 3/4s filled to be able to top off with cooler water as needed. Even though the invention itself is not too complex, it is a testament to the general level of education Cubans hold as well as their drive to solve difficulties regardless of the scale.

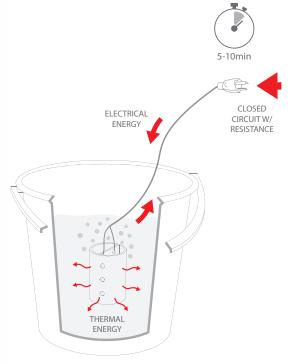


Fig 37. Heating Diagram

Wikipedia. 2021. Joule heating. Accessed November 15, 2020. https:// en.wikipedia.org/wiki/

Joule heating.

Due to the lack of resources, many variations of this immersion heater are often found in households made from wildly different materials yet sharing the same heating principle and main components. One common alternative is using two metal cans as opposed to a coil and PVC pipe. The inner can is connected to the cable (acting as the resistance), wooden blocks are wedged between both cans (isolating the current) and an outer can creates a protective casing to avoid injuring the operator.

A catalogued documentation of these heaters alone could fill a book in itself, considering access to warm water is so essential one can assume any person that does not have a traditionally manufactured gas or electric water heater has had to assemble one of these homemade prototypes. Some people go as far as introducing the immersion heaters into shower heads directly, heating the water as it comes out. This, of course can be extremely dangerous and not necessarily as efficient however it is another solution which does have the advantage of showering free-handed with direct running water. In some cases, albeit much less commonly seen, people will use these types of heaters to heat up frying oil when they don't have enough gas or burners to cook with.

The topic of access to running water in Cuba is a daily struggle, water treatment plants as well as the national hydro infrastructure are not exempt from the state of deterioration taking over the island.³² In major cities direct water access from the plants are restricted to certain hours of the day, for example 8am-5pm periods. While many other towns and rural areas receive direct water access two or three times per week. This results in the need for daily water storage to be integrated to the everyday dwelling. Water tanks are a common sight in rooftops, balconies or platforms along most buildings. These generally tend to be plastic, concrete or metal tanks; however it is not uncommon to find homemade tanks as well.

Reserve water tanks not only become an integral component to residential buildings and units but also to the people's lifestyle. Residents actively monitor when to fill the tanks from the city water, they plan water-related tasks such as laundry, car washes, showers, etc. around when the best water pressure and free-flowing volume will be. As mentioned, for some this is a daily routine, for others it's a weekly one and as a result there is a need for the inevitable daily use of the infamous water tanks. Some people are able to acquire plumbing pipes and repurpose mechanical pumps in order to connect their tanks to the house's plumbing system. However, many residents -depending on their living conditions- are forced to manually retrieve water from a reservoir. The quality of the water is another public health issue, as deteriorated pipes have breaches or leaks which are vulnerable to contamination. It is common practice for residents to boil and filter any water that will be consumed in order to avoid common parasites or diseases such as giardia.

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Fig 38. Water Heater Component Breakdown



Fig 39. Showerhead Electric Heater

Plastic shower head with immersion heater installed at point-of-contact, these can be dangerous and result in electric shock if there is an exposed contact directly touching the water pipe.

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Fig 40. Electric Water Heater

Fig 41. Electric Water Heater

Figure 40 shows another Cuban prototype of electric water heater, this one uses a wooden handle from a jump rope which has been carved to embed a coil. Its peculiar shape acts both as an isolator as well as the casing.

All these heaters, while assembled from different materials, follow the same basic physics principle of electrical energy conversion into thermal energy.



EL CARPINITERO

THE CARPENTER



Fig 42. El Carpintero Axo Scene



Fig 43. Scroll Saw

Woodworking tool found in a homemade carpentry shop.³³ Hardware stores rarely stock power tools, nor are they affordable for Cuban consumers. Finding himself in need of a standard tool such as a vertical saw, the Cuban carpenter creatively used components at his disposal to fabricate himself this ingenious woodworking contraption.

A scroll saw is a standard machine found in most woodworking shops. Traditionally a scroll saw uses a reciprocating blade which runs in an up-down motion at high speeds to cut through material. This machine is advantageous for its capacity to allow free handed cuts, with the ability to cut irregular geometries -much like a jig-saw. Regardless of the scale of the project, scroll saws tend to be used throughout the process. Most power scroll saws today are electric powered and have many different settings on cutting speed, power, angle, guiding arms, various blade types, some are even automated for ultimate precision. However, the core purpose of the tool remains the same, to cut through materials on a flat surface.

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Fig 44. Scroll Saw on site



Fig 45. Scroll Saw on site



Fig 46. Scroll Saw on site



Fig 47. Scroll Saw on site

This Cuban invented scroll saw is no different from commercialized ones -in terms of purpose, that is. The function is the same, a material can be displaced along the machine bed as the saw cuts freely through it. However, the means by which this one is achieved is wildly inventive. It repurposes an old electric motor from a 1970's Soviet washing machine, connected by a spare electric cable from an old household floor fan in order to achieve circular rotation. The motor converts electrical energy into mechanical energy. An electric current from the power supply interacts with a stator and a rotor creating a magnetic field, winding to generate a force in the form of torque which is then applied to a shaft. This shaft transmits the rotating force to a drive pulley. Attached to the pulley the carpenter had to use a drive belt long enough to connect to the receiving pulley. For this, he used a worn-out serpentine belt from a 1982 USSR Lada 2107 automobile, this belt is found in the engine as it transports power to the engine accessories. The belt was too wide for the washing machine motor pulley, it was cut in width as well as in length and bonded again into a closed loop. The belt then sits on the machine pulley of a 1950's American Singer sewing machine, which had originally been manually operated by a hand wheel and foot pedal. The rotation motion carried by the belt from the motor is then transferred through the sewing machine's arm shaft, this connects to a crankshaft which converts the rotational motion into reciprocal motion (upand-down linear motion). The former needle bar had been retrofitted to receive and fasten a home-made metal blade, which is the final component to the scroll saw. The machine is then fastened to a homemade stand made from scraps from an old wooden door, sheet metal as well as reinforcing steel bars taken from construction sites and welded together to stabilize the table.

1970'S USSR WASHING MACHINE

The Cuban-Soviet relations are world recognized, largely from their implication during the cold war and their mutual practice of the principles of socialist agendas. However, their bond intertwines far beyond selective instances. When we pay close attention to products, literature and architecture present in Cuba it is evident just how strong the Soviet influence was during the first decades of the Cuban Revolution. Following the Cuban Revolution triumph in 1959 -and the subsequent American embargo imposed on the island- the Cuban government turned to nations which shared mutual beliefs and mutual adversaries. Cuba became a member of the COMECON organization (Council for Mutual Economic Assistance) in 1972.34 This organization was established in 1949 as a trade and economic coordinating group of the Soviet Union and its Eastern European allies, Cuba was admitted as its 9th member nation. Protected under this economic alliance. Cuba traded their exported and imported goods nearly exclusively with Soviet nations between 1972-1991.35 Residual evidence of this mutual political and economic partnership can still be observed today. especially when looking at iconic household items. In the case of the scroll saw we find components from the famous Russian AURIKA washing machines.

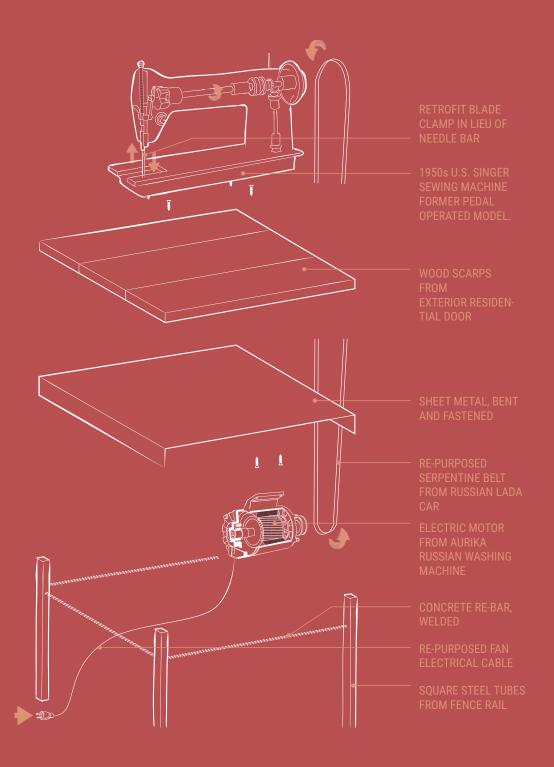


Fig 48. Scroll Saw Component Breakdown

New York Times,"Cuba Becomes Full Member of Soviet Economic Bloc"

35 Plinio, "Cuba 1990-1994", Accessed June 15, 2021.

These arrived at the island in the early 1970s, completely changing domestic life in the country. Although these washing machines were highly desired by Cuban consumers there was simply not enough to supply the general population. Therefore, the Cuban government turned to one of its common socialist strategies to address supply logistics: the labour merit reward. This consisted in rewarding a number of distinguished employees with the opportunity of purchasing the goods available (washing machines, television sets, pressure cookers, etc.). The employees were mostly from the medical and education fields. Apart from tourism, the Cuban regime relies on trading their doctors, teachers and athletes internationally as a means of economic revenue. Ever since the government began its first trade of medical personnel to Algeria in 1963, the island was calculated to have sent over 60,000 trained professionals internationally to remote endangered areas in need of medical or education assistance by 2012.36 The government would in turn seldomly 'reward' them with basic incentives that were otherwise not available to the general public. It is important to understand the washing machine was not the reward, the reward was the opportunity to purchase it. Employees were then responsible to find enough money (often sent from family abroad) to purchase the disproportionately priced household item other wise the opportunity of purchase would be passed on to the next person.

The Aurika washing machines were designed and manufactured under a non-capitalist system, therefore planned product obsolescence was not an implemented business strategy. This resulted in products built to last, Aurika motors being a prime example of this. The main body of the Aurika washing machines were not designed for Caribbean Island climate corrosion and most rotted throughout the decades, however their motors continue to operate 50 years after their manufacture date. The motor's endurance made it one of the most modified pieces of equipment across the country, found used in many other household items as well as various applications in industrial fields.

1982 USSR LADA 2107 AUTOMOBILE

When foreigners think about Cuba, one of the first things that come to mind are the famous Cuban cars. The Soviet and all-American cars which somehow seemed to freeze in time and remain 70 decades behind. While these cars are examples of some of the most creative mechanical engineering Cuban artifacts, it is beneficial to first understand the Cuban transit system itself.

As the country's economic health declined, the public transit infrastructure reflected that same state of deterioration. Public buses would run fewer trips, shorter routes, and would reach limited centric areas. During rush hours city buses are dangerously overcrowded, people pushed into one another and often hanging from doors or windows. Some of the bus routes have been nicknamed by locals as the ghost bus for their reputation of simply never showing up. Thus, the Cuban people rose to the challenge and slowly formed

a wonderfully ingenious unwritten public transit network which when analyzed speaks wonders of the ability to self-organize as a society.³⁷ People with their own private owned cars began to operate as taxis. Trying to make ends meet a taxi driver makes substantially more money than for example a teacher or an engineer. However, these taxis are nothing like what we understand Western taxi services to be. For one, as opposed to standard taxis, the passenger does not tell the driver where to go but rather asks the driver where they are going. The cars typically operate through somewhat of a regular route per locality, it is up to the people to know these beforehand and the flat rate charged for them. It is fascinating to observe how the driver and the passengers waiting on the road communicate. As taxi drivers approach, they meet eyes with the people flagging them down, and without missing a beat they read their hand motion, this is the key. The way in which you stick your hand out not only gets their attention but also communicates their desired route, the taxi driver then indicates whether they are going that way, if they are full, or finally if they will pick you up, all of this happening within seconds without ever slowing down, street after street. These 1950s American cars or Soviet rundown machines miraculously drive hundreds of kilometers daily, transporting thousands of packed Cubans all over the cities. It is quite fascinating to understand, each town with their own routes. fares and stops, all unregulated and self-organized by the locals. The only way to learn about it is to follow the clandestine laws of the streets.

This added layer of self-organized systems addressing issues such as transit deficit serves as additional evidence of the resilient nature of the Cuban people. It speaks volumes to their core values of helping one another and adapting to subsist when facing the ever-growing hardships imposed as a result of the current government body. While this system is commendable as an alternative enhancement to public transit deficiency, it is by no means a solution. The state in which these vehicles operate are unreliable, unsafe as well as inefficient and damaging to the environment. Every day is a struggle and an inconvenience for both the driver and the passengers. However, 'struggle' is the known way of life in Cuba for everyone. Hence, it is a relative term. Even though many outsiders may view the living conditions in the island as miserable, the Cuban people find the faith to not lead miserable lives, but rather convert the feelings of oppression, impotence and frustration into hope, positivity and creativity.

³⁷Blanco, Hilda and Anne
Vernez Moudon. "Havana's
Transportation System:
Future Scenarios."
Transportation Research
Procedia 25, (2017):46794691, https://www.
sciencedirect.com/
science/article/pii/

S2352146517306178.

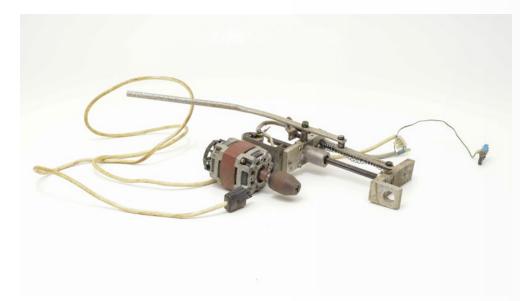


Fig 49. Drill Press

Homemade drill press, found in the same woodshop as the previous scroll saw is this Cuban iteration of a table drill press.³⁸

This drill press is composed of a drill head from a power handheld drill, an Aurika washing machine motor, plumbing PVC piping, repurposed electrical wires, a retrofitted tractor shifting lever and motorcycle springs. The Cuban carpenter fashioned a stand for the drill from scraps of aluminum and steel, then mounted the motor and drill head which would be lowered into the table by pulling on the lever, drilling through wood or metal materials.

These two artifacts are specifically unique in their nature, not only do they re-use components from things like vintage washing machines, tractors or sewing machines, but they are specific tools themselves seldom found in common Cuban households. They were created by a Cuban which made a living off of his woodworking business. Like these there are many types of discipline-specific equipment which Cubans have altered to suit their trades. Hairdressers repurposing old deodorant bottles to fashion homemade curling rollers. Nail aestheticians adapting micro motors previously used in dental clinics to facilitate the shaping and polishing of acrylic nails. Self-owned restaurants (paladares) transforming steel drums into charcoal ovens. The list goes on for nearly every small business owner in Cuba, who have to be creative in order to keep their clandestine business afloat.³⁹

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Fig 50. Drill Press on site



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Fig 51. Drill Press on site

38 Azcuy, "Cuban Ingenuity" CADE.

39
Winocur, Marcos. "Cuba
1959-1971: Construir
el Socialismo en el
Subdesarrollo." Investigación
Económica 43, no. 167
(1984): 239-254.



THE ORISHAS

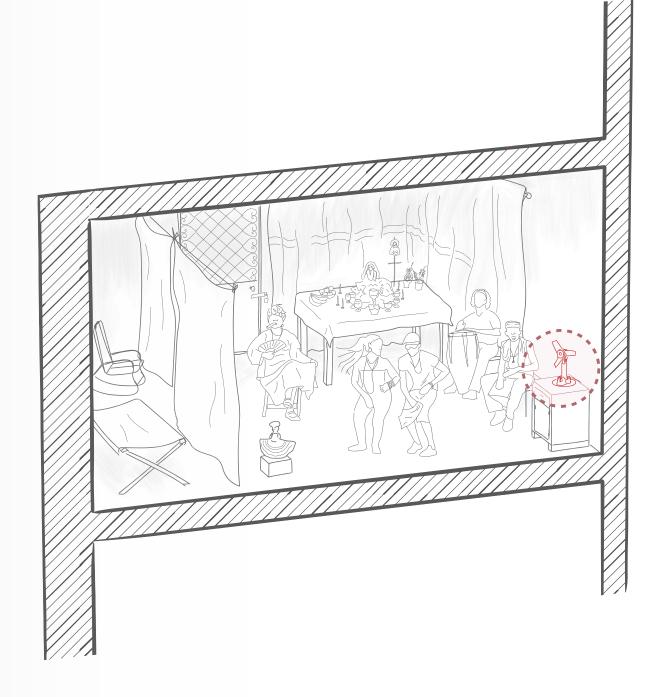




Fig 53. Orbit Fan

The next artifact capturing our curiosity is a fan, a staple household item with a whimsical assembly. At first glance, its ruggedness and deterioration are apparent. The rust, dents and scratches may instinctively disqualify it from a sophisticated apparatus. Yet once we begin to dismantle its components, the creative critical thinking is undeniable. First, the base of the fan is a repurposed disk brake from a Soviet Moskvitch car. The shaft was used from a metal water pipe, fastened by a bolt adhered to a soda bottle cap. Powering the blades is a Russian Orbita motor. These motors, similarly to Aurika motors, have extraordinary durability and have been salvaged to be used in many applications including water turbines and knife sharpeners. Lastly, the blades were handshaped from a recycled plastic sheet.

Given Cuba's tropical climate with high temperatures and humidity year-round, a fan is an essential item in every house, classroom, office and even vehicle. Most Cuban homes or places of work don't have central air conditioning; therefore, one must get creative to make the temperatures bearable.

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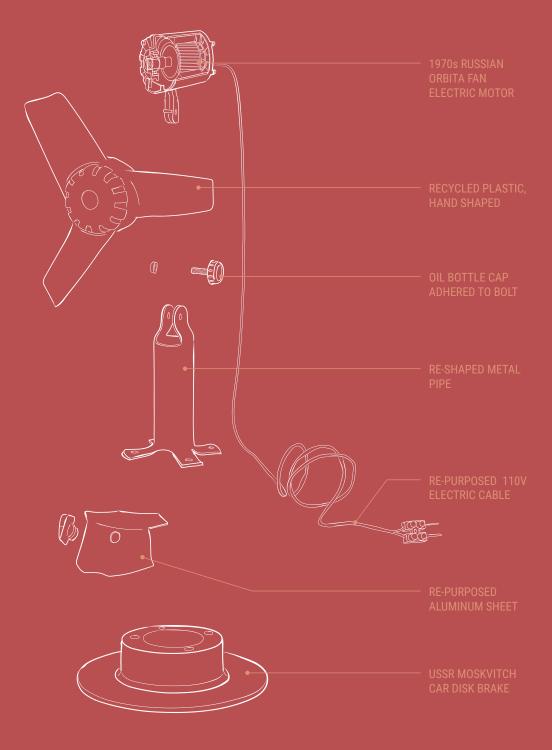


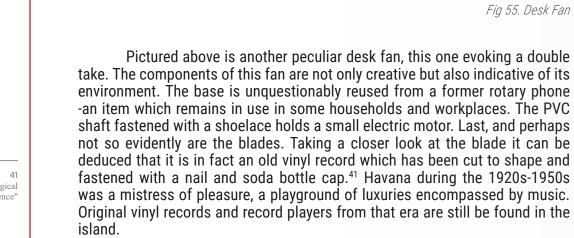
Fig 54. Orbit Fan Component Breakdown

Azcuy, "Cuban Ingenuity"

CADE.



take. The components of this fan are not only creative but also indicative of its environment. The base is unquestionably reused from a former rotary phone -an item which remains in use in some households and workplaces. The PVC shaft fastened with a shoelace holds a small electric motor. Last, and perhaps not so evidently are the blades. Taking a closer look at the blade it can be deduced that it is in fact an old vinyl record which has been cut to shape and fastened with a nail and soda bottle cap. 41 Havana during the 1920s-1950s was a mistress of pleasure, a playground of luxuries encompassed by music. Original vinyl records and record players from that era are still be found in the



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Fig 56. Desk Fan Component Breakdown

Oroza, "Technological Disobedience"



DELICACIES CAFE

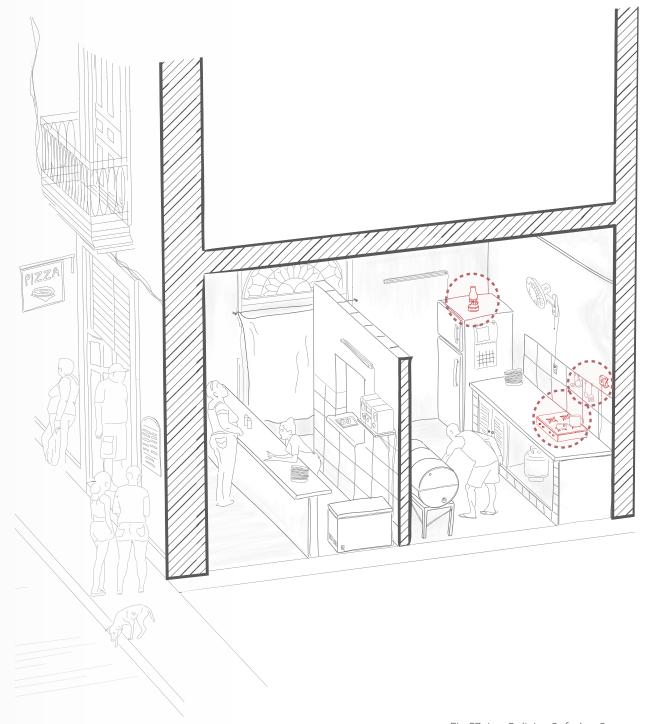


Fig 57. Las Delicias Cafe Axo Scene



Fig 58. Kerosene Stove

Cuban cuisine is known for its Caribbean flavours and colorful assortments. Although, the everyday diet of a Cuban resident is far from what is shown on traditional recipe books. Along with a declining economy which has limited imports of goods, the food industry in Cuba does not suffice the population's need. Food supply is not the only culinary struggle, having access to properly working stove tops, or ranges can be a challenge for many households. Thus, creativity must spark to resolve the deficiency. Thousands of contraptions can be found as stoves through various approaches.

Figure 58. A re-purposed gas hot plate retrofitted to accommodate kerosene as propellant.

Figure 59. Compressed fuel stove which has been assembled with repurposed sheet metal. The rigidity of the metal gauge allows for a sturdy unit, able to hold a full bucket of water to be heated.

Having the ability to boil water is detrimental as it is done to extract the calcium, kill bacteria and filter before using it as potable water. Another common need for boiling buckets of water is to wash cloth diapers in lieu of

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Fig 59. Compressed Fuel Stove

disposable ones. And of course, these outdoor heavy-duty stoves are used to cook the famous Cuban caldosas. A traditional stew prepared and shared between neighbours during festive occasions and especially during the infamously obligatory Revolutionary Defense Committee (CDR) meetings.

An industry that often finds itself in need to invent alternative cooking appliances are the small family-run restaurants, better known as 'Paladar(es)'. While the limitation of access to ingredients or equipment causes frustration, it inevitably results in ingenuity. Cuban paladares began in 1993, when the government legalized a number of self-employment occupations, including those in hospitality. These 'survival-fare' to-go cafes propped up all over inside Cuban homes, serving almost exclusively the national clientele.

Paladares stand as an immersive lesson of an underground subculture that eventually went and remains mainstream out of necessity. Menus are continually in flux as it is impossible to have a guarantee of constant supply of all ingredients. Basic items like butter, milk, eggs or cheese are often gone before they hit the shelves and thus the Cuban culinary creativity and product sourcing rises to the task.

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Hernandez-Reguant, Ariana. "Cuba in the Special Period: Culture and Ideology in the 1990s." Basingstoke: Palgrave Macmillan, 2010.



Fig 60. Electric Hot Plate



Fig 61. Electric Hot Plate

Figure 60, Working 30-year-old homemade electric burner in hand-shaped metal casing. The wire used as resistor is heavier than typical nichrome wires, allowing for a greater heat transfer and durability.

The pinnacle of the Cuban culinary creativity was arguably during the 1990s Special Period. The everlasting scarcity of food drew out an ingenious of new gastronomy recipes. Ground beef was substituted for ground plantain peels. Shredded coconut desert was replaced by shredded cabbage or carrot in a sweet syrup. Coffee was ground and mixed with ground peas to meet the demand of the vital daily drink of the island. In the absence of meat products, the grapefruit peel steak was invented, seasoned, breaded and fried to resemble the Cuban favourite bistec. Even items like shampoo or toothpaste were concocted through amateur formulas involving baking soda, salt, rubbing alcohol, lime and vinegar. However, some of the most shocking urban legends of the time were the condom pizzas and the mop cloth steaks. It is said some paladares resorted to supplementing cheese with sliced condoms in pizzas to simulate glazing. Similarly, it is said mop cloths would be marinated, tenderized, breaded and deep fried to be sold as the popular pork sandwich.

However, the shortage of foods was not limited to the Special Period. In 1963 the Cuban government banned all private slaughter of cattle due to the decline of livestock. The Castro government appropriated all of the private farms and held an absolute monopoly on their production, they also controlled legislation towards it, making it illegal to commercialize or purchase beef privately. The government prioritized supplying the tourism industry with the products first and if anything remained it would be distributed at unattainable prices to nationals. Elite citizens resorted to the black market for their meat needs, however they risked penalty fees and up to 10 years of imprisonment. This ban instated in 1963 remained enforced until April 2021, claiming the freedom of hundreds of starving Cubans trying to make ends meet.

Today, Cuban's meals continue to be an assortment of imaginatively sourced, prepared and cooked recipes with 'appliances' equally as original.

Hernandez-Reguant, "Cuba in the Special Period"

Frank, Marc. "Cuba Loosens Ban on Cattle Slaughter, Sales of Beef, Dairy." Reuters. April 14, 2021. Accessed June 17, 2021. https://www.reuters.com/ world/americas/cuba-loosen: regulations-killing-cowsselling-beef-2021-04-14/

Burchardt, Hans-Jürgen. "La Última Reforma Agraria Del Siglo: La Agricultura Cubana Entre El Cambio Y El Estancamiento." pp. 33–56 Caracas: Nueva Sociedad, 2000.



Fig 62. Electric Stove Igniter

Pictured above is a sophisticated and efficient home-made stove igniter commonly found in Cuban households. In order to light kerosene stoves with alcohol preheating, Cubans created the electric alcohol igniters. These were three-fold, it consisted of a simple electric resistor, a metal needle and alcohol reservoir. The small metal needle would be introduced in a bottle containing alcohol, often a re-used glass medicine bottle. The needle would then be grated against the live resistor, producing a spark. The spark would result in a flame which was then transferred to the kerosene stove to ignite it. While this was a daily grueling feat, it was necessary as many relied on these igniters to get through the toughest of times.

Typically, matches are a monthly item available for purchase through the household's supply book (known as 'la libreta de abastecimientos') however even matches go missing from the shelves in lieu of sufficient supply. This brings us to a very peculiar communist system still implemented today, la libreta. In brief, this supply book accounts for every resident within a household and is registered with the local bodega, butcher shop and pharmacy. These then administer and sell the monthly rations of foods and basic household items allocated to the residents. The government-regulated rations are unthinkable to the Western world. Typical monthly supplies for a house of four include a pack of hot dogs, a carton of eggs, two chicken legs and thighs, 1 dinner roll per

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Fig 63. Oil Lamps

day, ground soy (as substitute for beef), rice, beans, sugar, etc. Any additional food had to be purchased at CUC currency stores (25 times more than the cost of pesos, CUP). Even then, these CUC stores are not exempt from the food shortage and low quality of products distributed. Needless to say, the wait lines go on for hours whenever a new shipment of food comes to the stores. It truly is a miracle to subsist in Cuba relying solely on the government salary or pension even as a distinguished professional. Most Cubans rely on financial assistance from relatives abroad who send money or pay clandestine mules to import basic products like cooking oil, coffee or spices to be delivered to their family members.

Much like kerosene stoves, we find their close ally, the oil lamps. The island's decreasing access to oil and decaying infrastructure makes for ordinary monthly blackouts, often lasting multiple hours. For months during the Special Period, the government instated planned black-outs lasting up to eight hours consecutively, and alternating throughout the day. These affected not just residential areas but also businesses and even healthcare offices. Thus, oil lamps must always be handy in every household. Pictured above is an array of crafted lamps including a recycled spam can, soda cans, medicine bottles, shoelace, rags and scrap aluminum. These lamps range in components using different igniters, casings and even fuel types. These lamps are also symbolic of most major hurricanes in the island which also induce excruciatingly long power-less nights.

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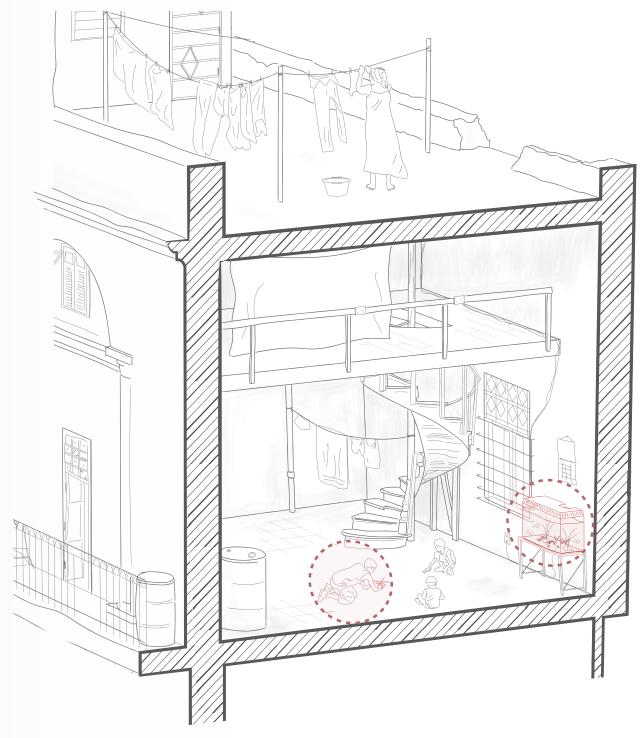
food policy and popular nutritional levels." Cuban Stud. 1981-1982;11-12(2-1):127-46. PMID: 11614379.

Handelman, Howard. "Cuban

Perez-Lopez "El Interminable Periodo Especial De La Economia Cubana".



CHINA'S HOUSE



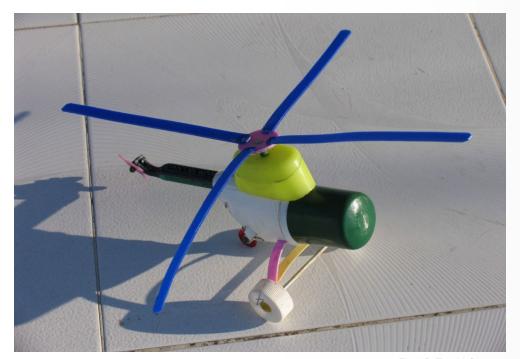


Fig 65. Toy Helicopter

Children, our society's future, those who carry the gift of innocence and irresponsibility. At least that is what we hope for our young ones, a happy and carefree childhood. This is not the case in many developing countries, Cuba is no exception. In a place where basic necessities are unavailable or unattainable, luxuries like a large selection of toys are unheard of. Those fortunate to afford the prices on the shelves cherish the toys their entire childhood and tend to share with their neighbours and classmates. However, the vast majority thinks outside the box to fashion their own toys to play with. This is an evidential instance where critical thinking and creative design is present from the very young ages of Cuban's lives, setting the pace for what will be their subconscious ingenious endeavours.

Pictured above are toys built from recycled deodorant bottles, bottle caps, glue bottles, straws, nails, razors and toothpicks. Children's imaginations are incomparable to any other, thus it is not surprising to see the contraptions made by them.

During the 60s, the embargo's implication on shortage of goods affected children's toys supply. As a response, the government implemented a toy raffle for all children in the island.⁴⁸ This followed the anti-capitalist mindset of constant consumption but more importantly it masked the critical shortage on goods. In principle, there were three categories, the basic, the non-basic and the mandated, ranging from most luxurious to least, respectively.

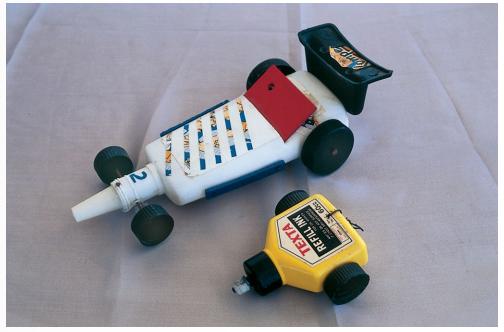


Fig 66. Toy Cars

Through a random raffle, each child in their district would fall within one of the tree categories and they would be assigned a day and time to purchase their toy. While some children would take an RV car or a bicycle home, others would have to settle for the designated bag of marbles or baseball with no option to choose otherwise. Although this socialist program promised to allow every single child to purchase a toy the reality was many were left empty handed. Eventually, this program dissolved as the shortage worsened.

Today, children continue to fashion their own toys. In elementary school the arts and crafts classes spark a great deal of creativity and production. Additionally, given children's love for the national sport of baseball, it is typical to see them play with 'baseballs' made from rocks wrapped in paper and tape and bats from scrap wood. It is also usual to see kids rolling down the street in their wooden scooters (chivichanas) made from scrap wood and ball bearings as wheels. Another common source of toys is as a gift from a relative's latest trip from abroad, this of course is not the reality for most.

Winocur, Marcos. "Cuba 1959-1971: Construir el Socialismo en el Subdesarrollo." Investigación Económica 43, no. 167 (1984): 239-254.

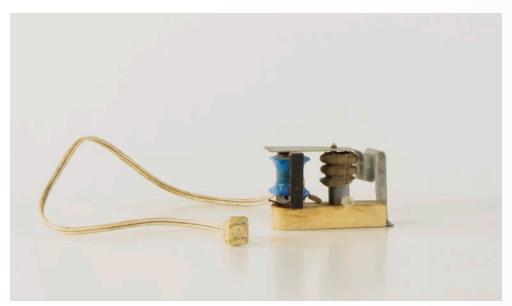


Fig 67. Fish Tank Bubbler

Elaborating on the topic of children, we come to one of the country's favourite pets and pass-time, fish. Given their modest need for nourishment and extra care, fish are a very common house pet. Being the largest island in the Caribbean, their relationship to water and the sea is like no other. Hence the admiration and enjoyment brought from having beautiful fish at home to enjoy.

Figure 67. A homemade aerating pump for a residential fish tank. While grasping an understanding for electricity and physics, the inventor used wood, galvanized iron, a small transformer, plastic piping and electrical hosing to create this bubbler. ⁴⁹ The galvanized iron plate is positioned at a proximity to the transformer, causing it to oscillate in an up and down motion. The iron plate is directly connected to the top of an air pump made of rubber hose and plastic pipe. The vibration from the plate then forces air through a plastic tube which is attached to the pipe. This process of aerating a fish tank ensures proper oxygenation to the water column, resulting in better water quality for the fish.

Cherishing the playful innocence of children is detrimental in a place where childhood runs out before it barely starts. Children are often burdened with the harsh realities which their families face and become contributing members at a young age. The education system is one of the first steps to rapidly bridge childhood to adulthood. Although, Cuban education was once a prestigious system to boast about, the reality today is it also faces a decline in quality. Without proper access to books, supplies or adequate instructors, the student's access to a renown education is limited.

The Cuban government's reputation and financial health strongly depend on tourism as well as the international exchange of professionals. Programs

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such as teachers and doctors without borders are key party points by which the communist regime claims its 'successes' to. The government trades brigades of these professionals with countries in need, in exchange for political alliances, oil and other goods. Therefore, the government regulates the number of post-secondary professions available to students, with a large percentage of slots for teachers and medical professionals, regardless of the student's interest or ability for the discipline. This results in teenagers between the ages of 16 and 19 as teachers, teaching all subjects to middle and high school students. As can be deduced, the quality of knowledge or pedagogy from teenage-teachers reflects on today's education system.

The education system was also comprised of mandated voluntary labour during the summer months where high school children worked in agricultural fields. 50 Classified as boarding 'country school', bus loads of students would be sent to schools out in rural areas of the country to collect potatoes, tomatoes and all sorts of produce while remaining lodged on site. Although this may seem unethically horrendous, the reality is students' fondest memories often surround their days at the country schools. Regardless of the mandated labour and subpar living conditions, they saw the bright side of it, treating it as a kind of summer camp with their friends for weeks on end. However, notso-fondly reminisced is the 1-year obligatory military training imposed on all boys once they graduate high school. Before they can pursue post secondary education, Cuban boys must 'voluntarily repay' their nation. 51 Although some were able to avoid enlisting through bribes and falsified medical reports, the majority has to endure the torturous and humiliating military training. In the current events of the 2021 Cuban protests this abusive mandatory enlistment has come to light, where teenage boys face treason charges if they refuse to serve their country in anyway required by the commander in chief. Any child soldier who refuses to beat their peacefully-protesting neighbors or relatives will face jail time or the capital punishment for treason against the Revolution.

Regardless of the obstacles that students face in order to access continued education, it is the older generations who are responsible for a respectable trickledown of knowledge to the young ones. Additionally, the exploitative communist agenda strongly pushes the importance of education in order to train professionals for profit. Hence, a general thirst for knowledge prevails and with limited access to the internet or books, Cuban students constantly self-teach themselves with a never-ending ambition. This is perhaps one of the most exasperating realities of Cubans. A society so full of knowledge and potential with no legal means to lead a dignified life in their country.

76

UNESCO, 1974.

Figueroa, Max, Prieto, Abel and Gutiérrez, Raúl. "La escuela secundaria básica er el campo: una innovación educativa en Cuba."

González, Argelis J. and Correa Crespo, Cecilia M. "La formación profesional del diferido de las Fuerzas Armadas Revolucionarias de Cuba previo a su ingreso universitario." EduSol 16, no. 54 (2016): 94-102.

LA ENTRADA

THE ENTRANCE





Fig 69. Electric Lawn Mower

The lawnmower is perhaps the artifact in this collection with the most evidence of traces to its material culture and social environment. Its complexity and creativity of component composition is fascinating, each part being reused from objects of completely dissimilar disciplines or even eras. This Frankenstein of a machine stores within it an encompassing recollection of Cuban history.

First, the breakdown. The lawnmower was built in the early 1990s and was operating for over 20 years since. 52 The inventor had to understand the basic principles required for the industrial design of an electrical lawn mower. Body, wheels, blade, motor, electric source. While this may seem straightforward, it can be impossibly difficult to build when none of the conventional parts are to be found for purchase or trade. Therefore, the inventor had to resort to alternatives which could play the role of the main components. Body: a vintage dresser drawer serves as the casing, along with a scrap wooden ladder acting as the frame and handle. Wheels: a selection of similar-sized wheels from toy carts, and baby strollers were collected and attached with scrap metal rods. Blade: an old machete was disassembled, the blade was cut symmetrically, bent to shape and sharpened. Motor: in order to rotate the blade in a circular motion a washing machine electric motor was re-used and fitted to attach to the machete blade. Electric source: understanding basic principles of electricity, the inventor sourced used appliance's electrical cables able to handle the energy load of the motor, for convenience a residential electrical switch was installed on the handle frame.

While the contraption itself is wildly interesting and inventive, it is

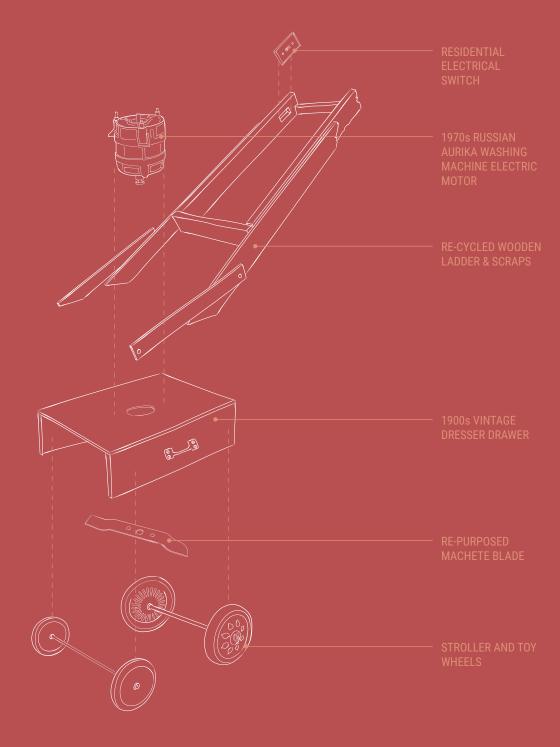


Fig 70. Lawn Mower Component Breakdown

Azcuy, "Cuban Ingenuity" CADE.

even more captivating to understand the components on their own and the relationship each has to one another and the inventor. Inspired by Edward Tufte's creative studies of representing information,⁵³ I decided to create a historical fiction lineage tracing analysis where we can observe a clear pattern of inheritance and internal trade through each component of the machine. These are essential practices maintained in post-embargo Cuba as it is the only way to obtain goods which are not accessible in the market.

First, we look at the vintage dresser drawer, the dresser could date back to early 20th century colonial furniture. During the 19th and early 20th century the Cuban elite decorated their homes with Empire-style furniture crafted from the island's plentiful supply of mahogany and other tropical hardwoods.⁵⁴ Furniture sets, appliances, kitchen-ware, and household possessions usually tend to trickle down through the family's generations remaining in use until they have completely deteriorated. The next component playing a role in the assembly of the lawnmower is a part from a 1950s American car. The car part is not directly in the machine but rather was previously acquired by the inventor by trading tutoring classes from his wife to a friend. The part was then traded for his neighbour's 1970s Russian washing machine electrical motor. The machete originated from a similar period in the 1970s during the infamous sugar cane harvest, aka 'the harvest of the 10 millions'. In 1970 the Cuban government dramatically paralyzed nearly every single one of its industries in order to devote workers towards harvesting and producing 10 million tons of sugar. 55 This was an effort to pay off the island's debt to the Soviet Union and repair its financial health. Workers from varying disciplines, blue or white collar, were forced to head to the fields to harvest sugar canes for nearly a year. Only 8mil tons were produced, this failure after extreme sacrifices was one of the toughest blows to the country's morale at the time. This chapter of history is present in the lawnmower through the blade of the rusted machete.

Another 1970s-1980s object whose component was used is a Soviet fan, these were mass distributed in the island and many are still functioning today. Its cable was salvaged and used to power the mower's motor. The wheels were taken from toys and strollers, one of which was purchased through the government-led toy raffle during the 1980s. The remaining components such as the wooden ladder, residential light switch and scrap wood were acquired within the 1990s decade just prior to the assembly of this machine by trading with family members.

This machine is not only evidence of Cuban design ingenuity, it is also a true testament to the Cuban culture of internal sharing, trading and crowd sourcing. It demonstrates the common practice of constant saving, storing and re-using items knowing they may hold great value in the future even if for unconventional purposes. Cubans have developed the ability of thinking alternatively with what is available along with the capacity to envision and foresee the worth and future usage of things.

81

53
Tufte, Edward R.
"Envisioning Information."
Cheshire, CT: Graphics Press,
2018.

Fernandez Martin, Mercedes.

"Cuban Furniture and
Interiors During Spanish
Presence." Laboratorio de
Arte 25, Vol.2 (2013).

55 Burchardt, "La Ultima Reforma Agraria del Siglo", 40.

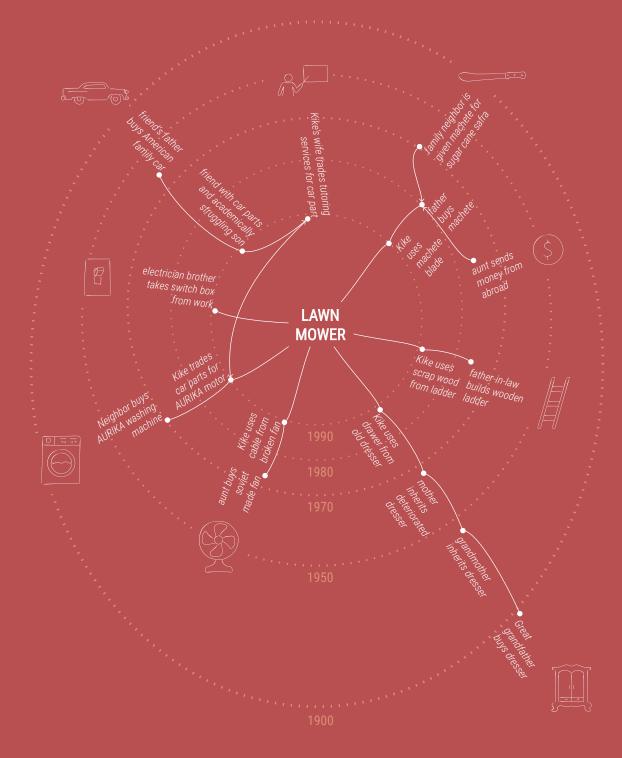


Fig 71. Lawn Mower Lineage Tracing Diagram

THE DOVECOTE

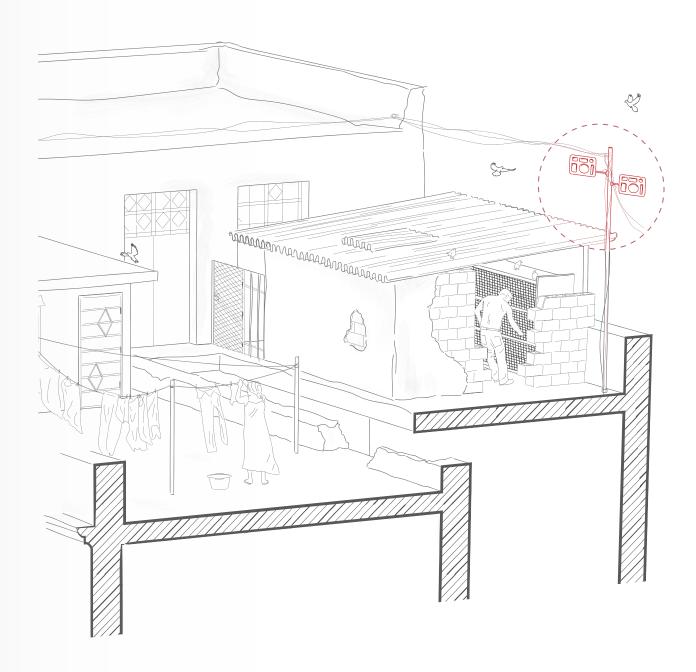


Fig 72. El Palomar Axo Scene







Fig 73. TV Antennas on Rooftops

One of the few means of entertainment for Cubans is to watch regularly programmed tv, which presently consists exclusively of 5 national television channels. Due to the island's Caribbean weather conditions, it is typical for rooftop antennas to be blown away by a hurricane or get damaged throughout the years. Aluminum lunch trays are found in most schools, here, they were re-used to obtain better signal to watch TV. Over-the-air radio waves from television stations are intercepted through the metal surface of the tray, then carried through a transmission line to the receiver. Cutting large holes or drilling multiple holes in them allowed for greater radio wave reception.

All five national television channels are under the control of the Cuban Institute of Radio and Television (ICRT).⁵⁶ Pre-Revolution, Cuba was one of the first countries in the Americas to have television service, the broadcasting market was highly competitive and provided a great variety of media. Post-Revolution, Castro's government applied a series of measures that transformed all national media. All television channels were put under the state's control and were to meet a set of values established by said government, regulating mass media. Cubans cannot legally watch or listen to independent, private, or foreign broadcasts. These five channels mostly would air Cuban regulated news, telenovelas, educational shows and documentaries, a select daily hour of cartoons as well as movies and a few other programs.

Television is only one of the examples of regulated mass media in Cuba, virtually all means of television, radio, newspapers and internet are tightly controlled and exclusively provided by the Cuban government for the past five decades. ⁵⁷ There is a strict censorship of information, news and commentary

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where journalists must operate under confines of laws against anti-government propaganda or the criticism of officials.

One of the government's greatest censorship efforts was the limitation of citizen's access to the internet. Cuba's crashing economy after the fall of the Soviet Union, as well as the U.S. embargo made the equipment and construction of internet infrastructure very expensive and difficult to obtain. As well, the government's interest was to isolate the people to access of information or vice versa their ability to denounce the national conditions to the outside world. Beginning in 2007, some restrictions were eased off. However, due to the cost, access to the internet remains a luxury in the island for most. Government-owned internet cafes as well as public wifi hotspots have been installed throughout select locations. These wifi hotspots are no more than a mere router installed in a city park or a neighborhood street corner with no designated seating areas, shading, electrical outlets or modes of privacy. Typically resulting in overcrowded intersections or parks filled with people shouting one over the other trying to connect with a loved one living abroad, or trying to surf the web as efficiently as they can. The cost of the new access is incredibly high, at \$4.50/hr rate, one hour of connection to surf the web or get in touch with some relatives would be the equivalent of 22.5% of the average Cuban's salary (equivalent to \$20USD per month). 58 Most Cubans who have 'the means' to connect to the internet have a relative living in a foreign country who sends them the funds to be able to afford those rates.



86

Fig 74. TV Antenna with Lunch Ttrays

"Cuban Institute of Radio and Television." 2020. About Television. Accessed January 13, 2021. https://www.icrt.

gob.cu/en/espanoltelevision/

Aldous, Viviana. "Censorship in Cuba," Law School International Immersion Program Papers, No. 2

Program Papers, No. 2 (2015). University of Chicago Law School.

Press, Larry. "Past, Present, and Future of the Internet in Cuba." Association for the Study of the Cuban Economy 21 (2011).

Once again, when faced with obstacles, Cubans find a way to create alternatives to enhance their way of living. Citizens have come up with various systems to surpass the government's restrictions to access to the Internet. Some get online through embassy's networks; others purchase accounts through the black market. The black market consisting of doctors, professionals or former government officials who have been cleared to have Internet access and then proceed to sell or rent their usernames. Similarly, people with access to dial-up email (typically doctors or government officials) would rent out their account and share it with friends or neighbors, this required organized subject headings to avoid confusion between recipients. While these were not ideal solutions, they enabled many people remain in touch with loved ones through weekly emails and check-ins.

One of the most innovative solutions to the lack of entertainment media is the creation of "El Paquete" known as 'the package'. This is a digital weekly package put together by people with internet access, sometimes brought in from mules living in foreign countries and distributed at a low cost to the general public. This is done as a clandestine operation, even though it is illegal, it is commonly practiced and rarely prosecuted. The package often includes a selection of movies and documentaries as well as series, which are respectively updated each week or month. Passed along through USB devices, direct LAN cables meandering from apartment to apartment, even hanging across balconies. This self-organized network of entertainment distribution while imperfect- has enriched the lives of many who are able to pass their time more enjoyably.

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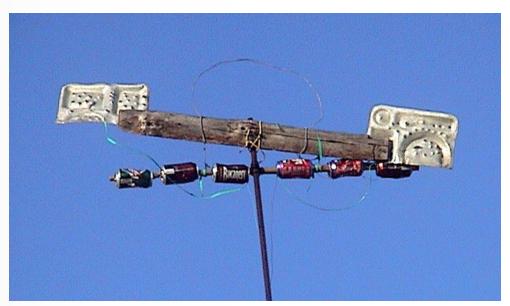


Fig 75. TV Antenna with Beer Cans



Fig 76. TV Antenna with Fan Cage

Pictured above are two iterations of TV antenna solutions including perforated aluminum lunch trays, beer and soda cans, plastic bottles, scrap metal and wood as well as a repurposed metal fan guard.



EL PATIO



Fig 77. El Patio Axo Scene



Fig 78. Rikimbili I

Bicycles play a fundamental role in everyday Cuban life; they serve as the principal mode of transportation for many citizens. Due to the unattainable price of cars and the unreliable public transportation system, a bicycle can be one of the most convenient ways to get around in the city. This was especially true during the Special Period in the 1990s, where the lack of national importation of oil impacted tremendously the ease of transportation -public or private. The transportation crisis became so critical that even schools and work places had to readjust schedules to accommodate the new normal. During this period the Cuban government imported large quantities of Chinese bicycles which were then distributed as prices through labourer stimulus programs.⁵⁹ An employee awarded with the opportunity to purchase a bicycle would celebrate as if they had won a lottery and happily pedal dozens of kilometers to commute or do errands. As the years passed and the Special period alleviated, the use of motorized vehicles became more common again, yet the thousands of Chinese and Russian bicycles introduced remained. This became a new opportunity for Cubans to create a new transportation prototype, the hybrid between a bicycle and a motorcycle, the rikimbili.

Any fuel powered vehicle requires six main components to function: chassis, wheels, fuel supply, engine, exhaust and transmission/drive.

CHASSIS FUEL SUPPLY WHEELS **ENGINE EXHAUST** TRANSMISSION/DRIVE

59 Hernandez-Reguant, "Cuba in the Special Period"



Fig 80. Rikimbili II



Fig 82. Rikimbili IV



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Fig 81. Rikimbili III



Fig 83. Rikimbili V



Fig 84. Rikimbili VI



Fig 85. Rikimbili VII

Deriving from this basic equation there can be endless variations which include different ignition, braking, shifting, suspension and steering systems. Many Cuban inventors have abundant knowledge of mechanical principles to build these motorized bicycles, making it very common to come across hundreds of variations of these prototypes in the island. While the main six components remain common amongst nearly all of the rikimbilis, the parts used vary tremendously. The rikimbili's chassis are mostly old Chinese or Russian bicycles, although some older American bicycles have been used as well as scooter or custom welded frames. Wheels and tires may be the bicycle's originals or repurposed tires from motorcycles or trailers. The fuel supply tanks vary based on availability, although a very common practise is to use a plastic bottle and medical hosing like a sort of gasoline IV feeding the engine. The engine used is one of the rikimbili's most resourcefully gathered component. Users have mounted motors from chainsaws, water pumps, generators, washing machines, fumigation foggers and the list goes on. It is quite impressive the mechanical adaptations that they undergo in order to transfer the power to a bicycle chain drive.

While rikimbilis are constantly built by everyday citizens without formal mechanical backgrounds, the works of professionally trained mechanics or engineers are even more wonderfully ingenious. Bicycle and mechanic shops not only fix vehicles with creative components, but the tools they use, the technologies and the methods with which they perform their services are of tremendously imaginative nature as well. Cuban mechanics are artists, craftsmen, merchants and determined hustlers who never allow defeat regardless of the challenge.



LOS ARTESANOS

THE CRAFTSMEN

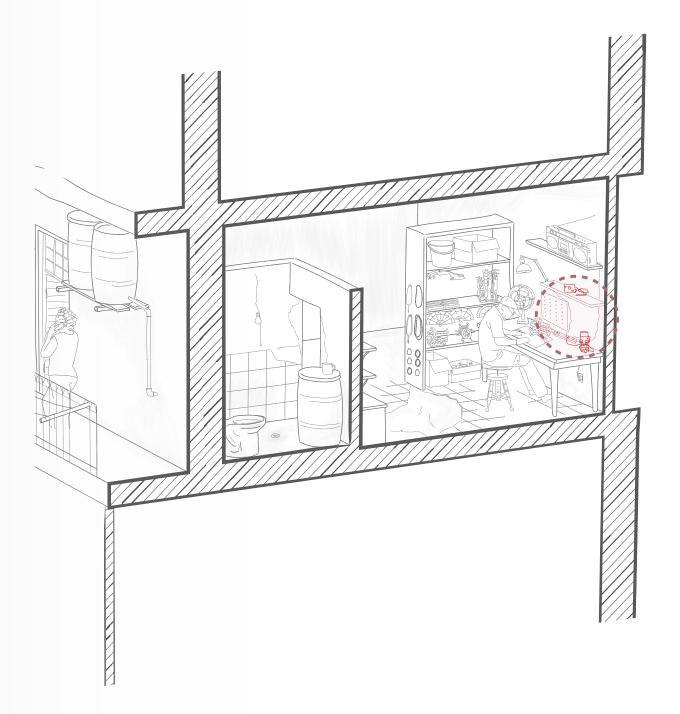


Fig 86. Los Artesanos Axo Scene



Fig 87. Wood Burner

Pictured above is a 2-in-1 contraption that serves as a wood burning tool and a hot wire cutter, used by a local artisan in his studio.

The burner is powered by a television transformer Krim 218, the creator used a coil from the original transformer and soldered several contacts. A dial is added to control the heat temperature, similar to one from an Orbita electric fan. When the wires are connected the high heat circuit is capable of cutting through glass bottles. This tool is used for making drinking glasses out of recycled beer bottles, making small glass containers as well as used for wood burning and engraving various items.

Artisans are very popular in the island as they fashion their own items to be sold at local stands or art fairs. The revenue from the sale of these miscellaneous goods is often very small, but in a country like Cuba, any extra income makes a difference. The greatest source of income for artisans is often in areas with high tourist presence where a day's worth of souvenirs sold can amount to the average monthly salary or more.



Fig 88. Dremel Etcher

Rotary tool fabricated by Cuban artist to be used as an etching tool in his studio.

The Cuban creole art and culture industry is arguably most creative in its way of fashioning the tools necessary to create the art than the art itself. Whether it be the creation of music, crafts or paintings, often the means are as fascinating as the ends. Pictured in Figure 88 is a dremel etcher, the artist uses this tool to engrave a variety of homemade souvenirs. The tool itself is a concoction of components including a small motor from the systems of a Soviet combat aircraft, a repurposed dental bur and a composite of different cords. The artist was able to acquire the motor during his time fulfilling his mandatory military service. Dentistry micromotors are a tool of high demand in the island's black market as people often retrofit the original machines to be used for various purposes especially in nail salons in the application and grinding of synthetic nails.

60 Azcuy, "Cuban Ingenuity" CADE.



Fig 89. Rock Tumbler

Another 2-in-1 Cuban homemade tool is the rock tumbler/palm sander pictured above. The main components include a wood disk with sand paper attached to the drive shaft of a Russian Aurika washing machine motor. The circular rotation of the electric motor serve as the simple principle of a handheld palm sander. However, the sander can be turned into a rock tumbler by adding a PVC pipe fastened with an aluminum casing. This creates a hollow chamber with an interior sandpaper base where small cubes of wood or plastic can be inserted to be reshaped into round beads which are later used for necklaces, bracelets and earings. This tool is a true example of Cuban consideration of all the possibilities capable in one design. Using simple mechanisms, the creator was able to adapt his tool to be as efficient as possible without the need to have a separate tool with another motor and materials. This artifact stands as wonderfully creative employing the most simplistic way, proving sometimes less is more when carefully thought out.

Artistic expression is of high importance in the island of Cuba. Whether it is the creation of a line of homemade jewlery, iconic souvenirs, poetry or songs, art is one of the few mediums in which Cubans can abstractly express some of their most repressed thoughts. The power carried by subjective art



Fig 90. Homemade jewelry and souvenirs

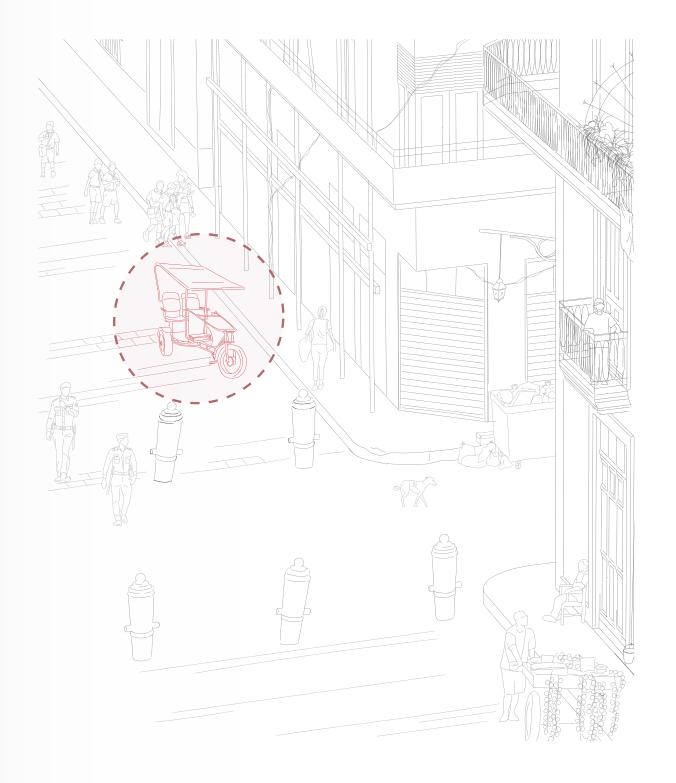
pieces produced in the island serve as an outlet to many who simply can't speak their mind freely. Art becomes a coping mechanism, protected by the subjective ambiguity of the beholder. Art has also been a very powerful and dangerous tool used by Cubans to protest against the repressive Communist regime. Although most of the brave artists who have explicitly expressed anti-government sentiment have faced harsh sanctions, legal consequences or blatant censorship.

Nevertheless, regardless of the government's strict control on the types of art they allow to be consumed in the island, some of these artists have been able to touch the hearts of many Cubans who relate in agony and impotence. In the present day, that power of art is becoming more evident than ever across the island. Where a mere song has the capacity to fuel an entire nation and spontaneously become a clandestine anthem and slogan chanted with the hopes for change and liberty.



LAESQUIMA

STREET CORNER



A bicitaxi is a classic Cuban hybrid of transformed cycles used for transportation. Similar to its motorized cousin (rikimbilis), a bicitaxi is built as an alternative to address the existing transit deficiency. However, bicitaxis -as their name suggests- are used for business purposes amongst nationals and tourists rather than personal vehicles. The basic principle behind them is a manually propelled tricycle which has seating capacity of three or four passengers while providing partial protection from the elements. Although the concept for this vehicle seems quite straightforward bicitaxis are some of the most curiously assembled inventions in the island.

Cubans may lack resources, tools and financial wealth but what they do have is a great scope of imagination. Their go-getter attitudes and positivity comes through when analyzing any of the bicitaxis. They may not be able to own convertible cars with fancy leather seats and sound systems but they sure know how to make the most of what is available. Starting with the basics, the frame and wheels of bicitaxis are sourced from all types of motorcycle, tractor, trailer or cart frames, some have even been assembled using old car's rear tires, axle and differentials. Similarly, the steering is achieved through bicycle or motorcycle handle bars, as well as car's steering wheels or welded scrap metal. Some bicitaxis have manual shifters to change gears in order to compensate for change in elevation. When it comes to the roof, various types of membranes are used from polypropylene sandbags to fabrics. Often, propaganda, graphics or flags will be displayed on the roof or the back of the seats. Most roofs also provide lateral protection from the rain, this is achieved through membrane rollup curtains which are weighed down by a piece of wood or fastened to the seats. The passenger seats can be as uncomfortable as welded metal planks to as luxurious as cushioned coach bus seats, it all depends on the connections the invertor has and their creativity.

Some of the more lucrative features of bicitaxis are the extra bells and whistles added to them. It is not uncommon to hear music blasting from a bicitaxi which has a car battery connected to an amplifier and speakers under the seats or hung to the frame. Some even offer plug in chargers for phones during the ride. These car batteries are adapted and connected to makeshift alternators to recharge from the output kinetic energy generated by the driver. Another extra feature found on bicitaxis are horns, while some are simple bicycle bells there have been many adaptations where air horns are powered by propane tanks, fire extinguisher tanks or even air pumps. Most of the bicitaxis with these additional features are usually found in the main cities of Cuba where tourists interact with them. A bicitaxi is not only a transportation mode from point A to B, it is also a vessel in which different cultures and worlds collide momentarily. Tourists and foreigners are able to directly immerse themselves in these contraptions which are so alien to their mass-produced and manufactured world. These rides tend to be an impactful experience as tourists take in all the unconventional methods present in the taxi even if they can't quite grasp the intricacy of every detail.

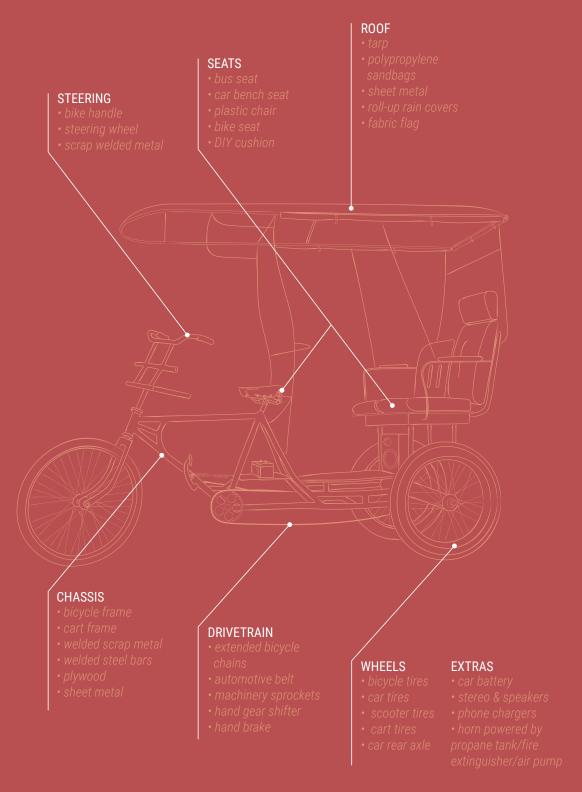
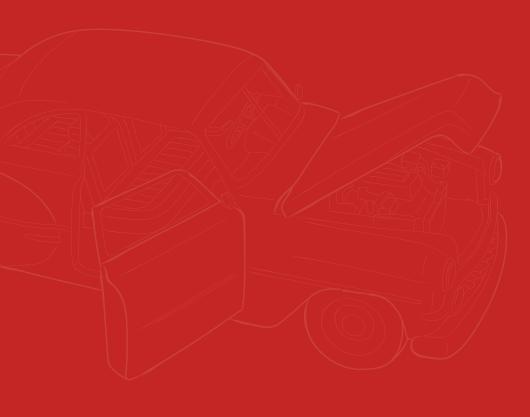


Fig 92. Bicitaxi Component Breakdown



EL PARQUE

THE PARK



Perhaps the most iconic artifact of all, the classic American cars, better known locally as 'el almendron'. The presence of fleets of classic cars roaming the streets of Cuba give an enchanting illusion of mechanical ghosts transporting us into a different era. Havana, the city frozen in time. Its buildings and urban spaces were designed to transcend decades, even centuries. Its vehicles, however, were meant to constantly cycle, thus the presence of +65 year old cars becomes such an outstanding feature of the city. So, how have these vehicles surpassed the test of time, elements, terrible road conditions and lack of proper maintenance? They haven't.

Ironically, these 'classic American cars' are some of the most diverse vehicles in the world. They stand today as a multifaceted concoction of parts and components from a multitude of other international vehicles. While their original chassis and interior can be restored, their mechanical components sooner or later seize to function. In lieu of being able to purchase new vehicles or American car parts, Cuban mechanics had to become inventive engineers. Similar parts would be salvaged from other vehicles and then re-adapted to fit. Other parts would be fashioned from recycled plastics, metals or household items. Many of the fundamental components found in the shells of American cars are from former Korean, Japanese, Russian, German, Spanish and French vehicles. These are the humble, unrecognized backbone of the Cuban classic American cars.

The reason for the determined upkeep of these cars goes far beyond a mere appreciation for the classic machines, but rather due to bans implemented by the Cuban Communist government. Up until 2011, Cubans could only legally purchase vehicles that were produced in 1959 or earlier. The government reserved its limited volume of newly imported cars as a stimulus for those who upheld professional, political, artistic or athletic merit. These select individuals would be granted with the opportunity of purchasing the vehicles, which could not be sold to others but rather passed down to family members. Even though today it is legal to purchase a vehicle the prices are astronomical even for first world salaries, without options for convenient financing. Leaving vehicles to be an unattainable product to most Cuban nationals.

Another absurd government restriction on private property was the prohibition of housing sales which was upheld for over 50 years until 2011. 101 This unimaginable restriction led to creative solutions for those who needed or wanted to move. Through a black-market system, Cubans would find ways to unofficially trade residences. This was a nearly impossible trade as many factors had to align between two or more parties such as same location trade interest, same down or up-sizing prospect, adequate compensation for difference in house value, as well as the overall alignment of interest in each other's property. All of this had to be negotiated without access to the internet or public sites where advertisements could be posted. These imposed obstacles have forced Cubans to become self-made businesspeople and resourceful traders with ample networking aptitudes.

61
"Cuba Lifts 50-year-old
Regulations on Car Sales."
CNBC. December 19,
2013. Accessed June 15,
2021. https://www.cnbc.
com/2013/12/19/cuba-lifts50-year-old-regulations-oncar-sales.html.

Hamberg, Jill. "Cuba opens to private housing but preserves housing rights." Race, Poverty & the Environment 19, no. 1 (2012): 71-74.

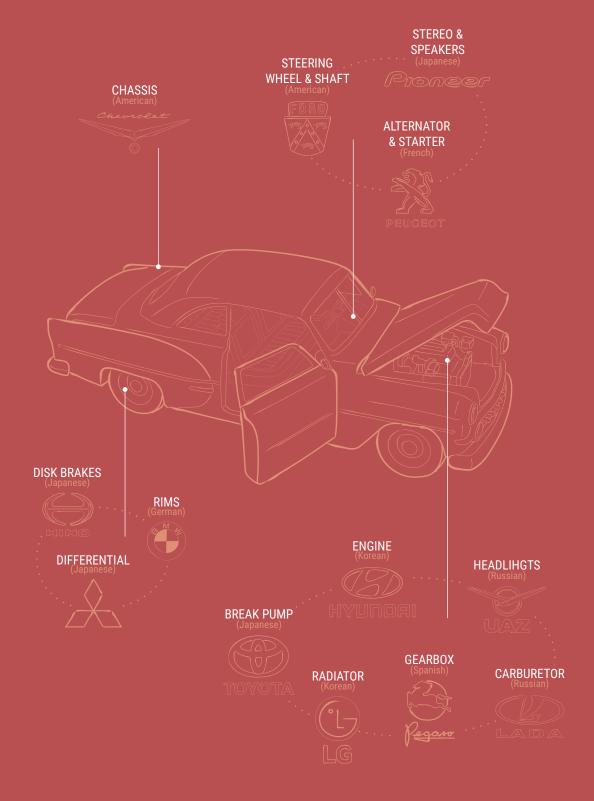


Fig 94. Almendron Component Breakdown

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LA AZOTEA

THE ROOFTOP

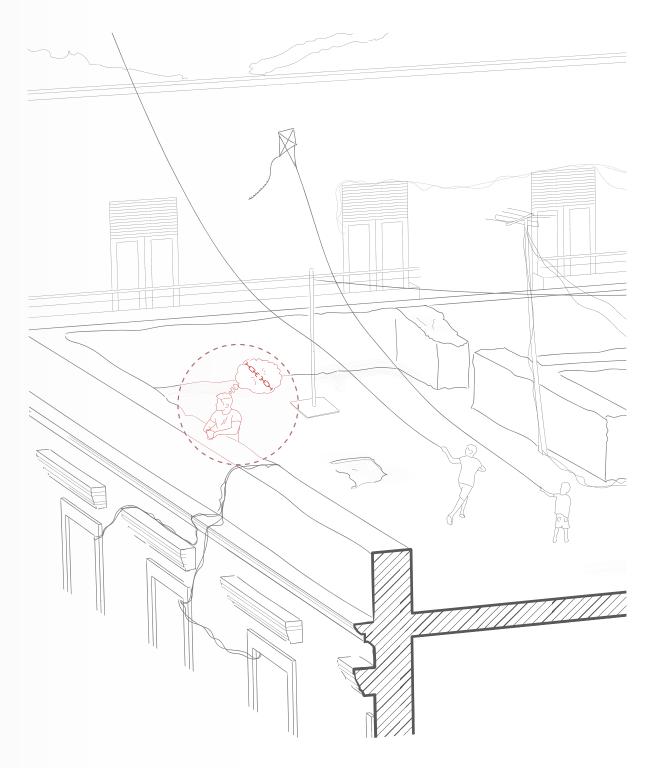




Fig 96. 1951 Chevy pickup truck-raft, 2003

The last artifact of the collection is as powerful in its innovative aspect as it is in its symbolic meaning. On the theme of creativity when facing necessities we land on the Cuban rafts, the ultimate inventions when facing the need to escape, to survive, to live in freedom. It is no secret the unjust laws, cruel persecutions and state of misery that prevails in the island. While some nationals may not agree with this statement, it is greater the number of those who do. Some stay hoping for change or to remain with their family, many sacrifice and migrate in the pursuit for a better future. However, exiting the island is nearly impossible for most as they require visas and granted permission by the government; this is a lengthy and expensive process with no guarantees. Therefore a very popular way of escaping the island is by rafts, hoping to cross the 90 miles and reach the Florida keys. The famous Mariel boatlift in 1980 saw a Cuban migration to the US of as many as 125,000 refugees. The US's close proximity, as well as its facilitation of refugee's path to legal status through the 1966 Cuban Adjustment Act makes it the ideal place to seek asylum.

Those brave and desperate enough throw their fate to the sea and tread north in makeshift rafts. Hundreds of rafts have been designed from scrap boards with sails to powered vessels. However, some of the most famous -which were in fact intercepted by US coast guards- were the truck and car rafts. The sense of unapologetic wit behind these rafts represents everything that is Cuban makeshift design. The materials and components are expressed in their raw identity, without masking or ornamentation. Its components reveal the context of their creator's environment. The assembly itself displays the mechanical knowledge and ambition of the designers.



Talamo, Javier. "The Cuban Adjustment Act: a law under siege." ILSA J. Int'l & Comp. L. 8 (2001): 707.

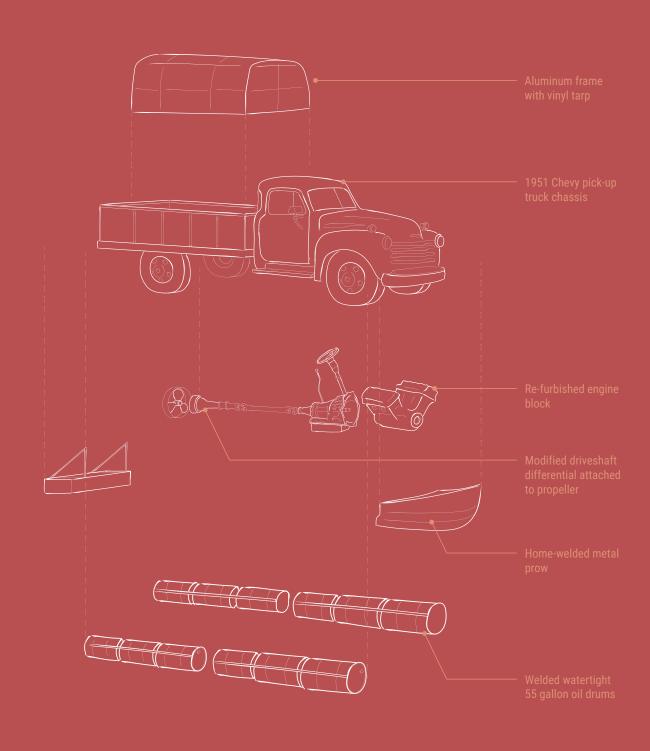


Fig 97. Truck-raft Component Breakdown



Fig 98. 1949 Mercury Station Wagon, 2005



Fig 99. 1949 Mercury Station Wagon, 2005



Fig 100. 1959 Buick car-raft, 2004



Fig 101. 1959 Buick car-raft, 2004

The basic components to these car and truck rafts are the vehicle chassis as a vessel, flotation devices, a motor driving the propeller and a prow to improve the hydrodynamics of the raft. The 1951 Chevy truck-raft in Figure 96 was amphibious, the creator and his crew were able to assemble on site within six hours for its use on land or sea. 65 After a failed attempt to reach American soil in 2003, the creator was returned to Cuba where he designed another car-raft, Figure 100. Their second attempt was on a modified 1959 Buick in 2004, which was also intercepted by coast guards. A last attempt by one of the members of the original crew was done in a 1949 Mercury station wagon in 2005. 66 The last two vessels were more sophisticated and efficient, the interiors were welded watertight, the prows were directly attached to the frame and the cars were fully functional on land. While the size of the vessels were direct giveaways to Coast guard radars, these valiant amphibious creations were nothing short of ingenious and perseverant.

As resourceful as Cubans seeking a life abroad are by sea, they are just as creative with sorting out creative legal ways to exit by air. The act of emigrating Cuba is an art in itself, trying to find legal loop holes, immigration programs and alternative travel visas that may apply to their specific scenario. Nearly every Cuban who migrated after the revolution has a fascinating story behind their process. The Cuban spirit of determination and critical thinking amidst any type of obstacles shines through and sooner or later triumphs.

This captivating unique society may drive those looking from the sidelines to explore what can be learned and implemented from post-revolutionary Cuban culture in their own societies. It is in one's nature to self-relate and explore how stories or lessons may empower our own paths. However, for a nation of people who have been robbed of opportunities, I believe the better question is, how can we use what we have learned about the Cuban community to benefit them? How can we intentionally implement the unique features of their culture into new systemic approaches in their society? The Communist government's ramifications have forced to turn Cuba into an island of hackers, DYlers and critical thinkers. Aside from the overwhelming circumstances of necessity which cannot be undone, can something constructive come from it? Can we embrace this new normal of creative citizens and build on their strengths?

Cubans are a creative community as a whole whom have spent the past decades creatively re-inventing what already exists. It is unimaginable what this island of creators could develop if they had access to smart design and manufacturing tools which were convenient, safe and productive without the burden of basic necessity holding them back. Through the introduction of communal fabrication shops, digital fabrication labs, access to materials and to opensource forums the Cuban cottage industry would boom. Not only would new products be available within the island but people themselves would be able to design more efficient solutions for their own specific needs. One can imagine the impact that access to a single 3D printer would have within a Cuban

neighborhood. The culture of community, sharing and helping one another would prevail while people's ambitions for knowledge and growth would be evident. Cuba is due for liberation and while sometimes it feels incredibly far away, lately it feels like we are at the cusp of change. When that change comes, when Cuban citizens share the liberties and the access that most do in democratic countries, a transition period will begin. While the future of Cuba is unknown, it is fundamental for planners, designers, policy makers and economists to recognize the phenomenon of this creative culture engrained in its citizens. This transition period will be an ideal opportunity to re-imagine Cuba while taking advantage of the existing spirit of individualistic creativity rather than resorting to a default model which ignores the national cultural environment.

The principle of autonomy present in Cubans should be cherished and encouraged in new generations, raising critical thinkers that question and understand how things function, material and/or systemic. Being autonomous in the way we design and create differentiates from the sheep-like mentality of a consumerist world, it results in specific, unique and thus captivating creations at any scale. The principle of reuse and adapting salvageable materials is unquestionably one to pursue in today's environmental reality, which at the scale of a whole country would represent an important impact. After all is said and done, the freedom that autonomy of design provides is something that every Cuban should be entitled to. Cuban creations, objects and architecture will remain evidentiary of the social reality that surrounds them in the present and could potentially serve as guides in the path to their new future.

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As a young immigrant I struggled greatly trying to define myself during my young adult years. Being born and raised in Cuba and having lived half of my life -to date- in the island, the answer seemed clear, I am Cuban. However, having spent my adolescence and studied my career in Canada, where I made many new friends and traditions, it felt unnatural to deny that I too am Canadian. The values engrained in me from these two disconnected worlds account for the person I am today. This is unquestionably evident throughout this thesis. The sense of duty, responsibility and privilege I felt when researching this topic was my main drive, with the intent of bringing awareness and initiating intentional discussions about a future Cuba.

I constantly felt dismissed of my experience under the regime with remarks such as "you were just a kid". And that is true, I was a child, I was also an extremely fortunate child to be sheltered from struggles my own classmates would face. However even as a privileged child I remember the feeling of impotence, of powerlessness, which only turned into anger and sadness as I got older. Today I have the opportunity to live a life full of possibilities, studying what interests me, exploring the world, building my future. Yet, these are all liberties which my own family, childhood friends and fellow Cubans are deprived of. While I was able to escape a life of limitations, I carry the heavy burden of knowing my loved ones live a life-sentence of this imprisonment. I carry the sadness of being separated from my cousins whom I adore and whom are so unbelievably bright and kind people.

Nearing the end of my thesis research, the events of 11J in the island shook me to my core. The collective momentum of breaking the silence and losing the fear awoke in me all these feelings I suppress daily. I wanted to spring into action. All of the sudden, my academic thesis felt like an insensitive mockery masquerading as an effort towards change. Especially seeing people being killed on the streets or hundreds imprisoned for speaking against the oppressive regime right at the palm of my hand. It was during this instinct for action that I came to the conclusion that there is time for action and there is time for thought. More importantly, one without the other would only result in failed attempts. I am not a trained soldier, I am not a policy maker, I am not an economist. I am however, an architect who understands the value of careful and conscious planning and development. I understand the value of designing not just in response to the site but to the cultural environment as well. Through my thesis I am able to identify patterns of behaviour within an entire culture in order to discuss how to best serve them once change comes. This thesis will serve as a stepping stone into my future conversations in the transition of Cuba. This work marks the start of my involvement in a professional capacity towards the systemic and built redevelopment of the island.

Lastly, I want to acknowledge the incredible preparation the University of Waterloo, School of Architecture and its faculty have equipped me with over the last 6 years. This community has challenged me to define what being an architect means to me, professionally and personally. I vow to honour the values instilled in me during my education in this institution.

With all of my heart, I dedicate this thesis to the people of Cuba.



CUBAN DESIGN:INGENUITY AND RESILIENCY TO SUBSIST

by

Amanda Reyes Martin

A thesis
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