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City-Building Practices in Riyadh, A Case of Master Planning from the Gulf

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A Case of Master Planning from the Gulf

By

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Abstract

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This research primarily investigates Riyadh's 1972 master plan, designed by the Greek urbanist Doxiadis. The larger goal is forming a solid analysis of master-planning approaches in the Gulf region. The 1972 plan has been previously discussed in numerous research endeavors, but often it is treated as an isolated project, in ways that reveal only dimensions of "What?" What were its specific features? What were its productive impacts on Riyadh? And what undesirable consequences did it unintentionally have? However, the work in hand takes a different lens. It moves beyond the "What" to understand the "Why" or the "How." Why was the plan developed in the way that was finally approved? How did it reach that shape? And why did it impact the city in the way it evidentially did? Those questions sit at the heart of this dissertation.

Specifically, it aims to inspect the 1972 master plan as a product of negotiations between many influential players and the culmination of dynamics that were in place long before the work on the plan had even started, and which were significant in shaping its outcome. Rapid developments, occurring internally in Saudi Arabia and externally on the global stage, were instrumental in determining the plan's final form. This dissertation concretely connects those relationships to the plan for the first time. The work's main contribution is thus to analyze the range of factors surrounding the decision to construct the plan and show how they influenced the creation process.

Throughout this research, many field visits and interviews were performed, archival material was recovered and examined, maps were evaluated, observations collected, and media analyzed. The research also depended on the collection of oral histories from a number of sources; some are original, others were never connected to this topic. What this research revealed is that contrary to the familiar narrative, the plan's process was not linear or one-dimensional, nor did it unfold in a vacuum or emerge from a lab. Rather, it was arrived at following a complex, multilayered process, and unpacking those layers is essential to fully comprehending and judging it. Finally, the 1972 plan may be seen as representing a timely response to a city that urgently needed a vision for its future, one that absorbed the enormous challenges it faced and created a system for instilling order through a period of unprecedented urban population and territorial expansion.

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Prologue

Within the Saudi urban context, Riyadh is by far the most dominant city in nearly every aspect. Being the capital and the largest city in the country, it plays a central role in Saudi Arabia's commercial, industrial, cultural, economic, and political life. In terms of politics and governance, all government agencies and authorities are located in Riyadh, and thus most of the country's political power is concentrated there. Approximately 24 percent of the country's building permits are issued in Riyadh, clearly illustrating the importance of the city in the economic sphere (Al-Hathloul 2017). Furthermore, Riyadh is considered to be one of the most powerful and influential urban centers in the Middle East. It is the fourth most populous city in the region; it is the second-largest Arab city (after Cairo); and it is the center for much of Saudi Arabia's social power, a condition stemming naturally from the fact that nearly 25 percent of the country's population lives there. As a center for social and economic activities, Riyadh has also transcended its region to take a seat on the global stage. However, historically, Riyadh has not always been so influential. A mere century ago, it was a small, isolated town in the middle of the desert, heavily dependent on its position on the trading routes linking more thriving settlements along the coasts of the Arabian Peninsula. Thus, in 1919, the city was described as covering an area of only 1 km² and having a population of only 8,000 (Al-Oteibi, Noble, and Costa 1993).

The transformation of the city into a global metropolis has been intense, rapid, and fierce, and taken place largely over the last two generations. Even by the middle of the twentieth century, Riyadh had no more than 50,000 inhabitants; yet more than 5 million people now call it home. The city's footprint, which today exceeds 3,000 km², was at midcentury limited to about 3.5 km². In the 1950s, however, growth gained momentum, and the city experienced a boom that continues to this day. Many events have influenced this trajectory, and many actors have had significant impacts on the form and condition of the contemporary city. Yet among these, there is no disputing the significance of the 1972 DA master plan for the city. In terms of Riyadh's urban transformation, it marked a fundamental turning point. The plan came at a critical juncture in the city's history and signaled its transformation from a quaint, organic town into an expansive, modern metropolis. More importantly, it unleashed processes and dynamics, and established parameters, which continue to guide the city's growth. Its enduring legacy still underlies many aspects of the city's changing morphology.

In addition to agreement on the importance of the plan with regard to Riyadh's urban trajectory, there has been clear consensus among historians that the plan should not be treated in isolation as a stand-alone project. Despite being one of the most discussed topics in Saudi urban scholarship, little consideration is typically given, however, to the context from which it emerged or the processes which led to its outcomes. Indeed, the plan is often analyzed and discussed in ways that objectify it, using questions that reveal only dimensions of "What?" What were its details? What were its constructive contributions to the city? And what adverse effects did it have on the future urban environment?

As Nelida Fuccaro (2009) has rightfully observed, accounts of urban development in the Gulf typically treat the region, "as if oil modernization had swept away urban history along with the traditional urban landscapes." According to this view, the development of Riyadh and other Gulf cities is commonly seen as "a tale of transformation from rags to riches" — a linear process

of change, with little regard for crosscurrents of urban complexity. In addition, such an attitude is common in approaches to all the cities within the six countries that form the GCC, the Gulf Corporation Council, despite their many differences. Farah Al-Nakib has pointed to another consequence of this prevailing attitude. As she wrote in 2016, "Gulf cities are often described in the scholarly literature as newly emerging metropolises . . . unburdened by history and therefore free to create a new identity." As a result, historical accounts typically treat them as clean slates, where planning projects have occurred in a void, and where external forces have largely driven outcomes. Such a view also typically assumes that development has occurred in discrete stages, each barely connected to what came before or after, each isolated in its own specifics.

With regard to Riyadh, scholars using such an approach have customarily failed to investigate the many influential conditions that played a major role in shaping the 1972 master plan and that have continued to influence the city they helped produce. In other words, there has been little attempt to move beyond the "What" to understand the "Why" or the "How" Why was the plan devised the way it was? How did it achieve the outcomes it did? The pursuit of these questions is the primary purpose of this dissertation. Specifically, it attempts to understand the 1972 master plan as a product of negotiations between many influential players and the culmination of dynamics that were in place long before the plan was produced, and which were prominent in shaping its outcome. DA did not operate in a vacuum. Nor was its plan for Riyadh implemented in an empty land. Rather, rapid developments, occurring internally in Saudi Arabia and externally on the global stage, were instrumental in determining the plan's final form. Understanding the larger dynamics and forces that shaped the plan will also be shown to be essential to understanding its lasting impact on the city.

The main contribution of this dissertation is thus to analyze the variety of factors surrounding the decision to create the plan and show how they helped shape it into a final document. Many have studied the 1972 plan as a stand-alone effort; however, I aim to look at it as a product of multiple events, ground it in its context, and reveal the many forces that shaped it. In so doing, the dissertation seeks to situate the plan within the context of contemporary events and movements around the world and produce a new understanding of it — one that moves beyond reductionist readings to a more complex view of its layers, foundation, and scope.

With the purpose of arriving at a more holistic view of the DA 1972 plan, the dissertation looks, for instance, at the urban history of Saudi Arabia prior to the arrival of "the Greek" — as Constantinos Doxiadis, himself, is often still referred to in the city. It goes back to as early as the 1920s to illustrate how processes begun at that time had a great influence on the plan, predetermining many of its outcomes. It also discusses issues such as American imperialism and European Orientalism, and it seeks to explain how these attitudes helped shape key aspects of the plan. Doxiadis's own growth and personal beliefs will also be seen as important to many of the ideas the plan contained. Indeed, experiences from his university training and early career helped shape key features of it. Furthermore, developments in other parts of the world (among which was the evolution of modernism as a design movement beyond ideas initially developed within the Congrès International d'Architecture Moderne — CIAM) had a significant impact on the plan. In particular, the period during which the plan was produced was characterized by the opening to serious scrutiny of early post-World War II planning work by CIAM member firms, creating the need to find new footing for the role of Western experts in the modernist tradition. The conditions of urban planning and design as a field and the need to respond to what was being proposed for cities elsewhere were all important to the process of creating the Riyadh plan. All of those

discussions and notions are analyzed here with the goal of establishing a proper awareness of the 1972 plan for Riyadh as a product of many forces.

Chapter 1: Introduction

A. The Setting

There are three major themes that recur throughout this work to explain and analyze aspects of the 1972 Riyadh master plan: the existing context for planning and urbanism in Saudi Arabia, the development of Constantinos Doxiadis's individual approach to planning and urban design, and the changing nature of the professional field in which his Athens-based firm, Doxiadis Associates (DA), operated. But before launching into a discussion of these, it is essential to understand the historical origins and circumstances of Riyadh as a city in the late 1960s, when work on the plan began. This will lay the groundwork for a number of essential questions. Why was the plan needed? Who was its client? What forces were in contention through its development? And what did it aspire to accomplish?

According to Janet L. Abu-Lughod (1987), two types of Islamic towns emerge from the historical record: army camps built for defensive reasons and political towns founded to mark the birth of dynasties and affirm their authority. In a contemporary context, Riyadh is plainly an example of the latter because it is closely associated with the modern nation of Saudi Arabia, the creation of the present Saudi dynasty. However, the underlying settlement, in the form of an agglomeration of residents of common ancestry, was established much earlier, specifically in 1746 by Dahham bin Dawas (Al-Oteibi, Noble, and Costa 1993). It was Dawas who also named the spot where he and his people settled "Riyadh رياض." In Arabic, this translates literally as "gardens," indicating that these people settled around a small oasis that provided them with food and fresh water. However, it would not be accurate to call this early settlement along the Wadi Hanifa (or the neighboring ancient village of Manfuha) a city. What was established then might more accurately be described as a tribal enclave. It is thus more accurate to state that the origins of the modern city can be traced only to 1824. This was when the Najd region of central Arabia returned to Arab rule under Imam Turki bin Abdullah bin Saud following the invasion and occupation of the entire Arabian Peninsula by the Ottoman-Egyptians under Muhammad Ali in 1818 and the destruction of the early Saudi state (Al-Oteibi, Noble, and Costa 1993).

The first written records of Riyadh's urban condition are even more recent. These date to 1902, when the city was described as having an area of 1 km² and a population of 8,000 (Al-Ayyaf 2015). Thereafter, the city's growth remained slow but consistent until 1919, when it experienced a significant expansion following the conclusion of World War I and the end of Ottoman control over the peninsula (Al-Oteibi, Noble, and Costa 1993). Although the subsequent pattern of growth was significant when expressed as a ratio, the city remained small by global standards. For another ten years, its footprint remained the same as in 1916, and it continued to be bounded by town walls as high as 8 m, and including gates and guard towers as was typical of cities in the region (Garba 2004). Until the 1930s, the main elements of the city were the governor's palace (Qasr Al Hokom), Al Masmak Palace, the main mosque (Jamee' Turki bin Abdullah), and a central market.

It was not until 1930 that the first building was constructed outside Riyadh's town walls. The work of King Abdulaziz, the founder of the modern Saudi state: this construction was Al Murabaa' Palace (Al Murabaa' means "the Cube" — a reference to its 400 m^2 footprint) (Fig. 1-1). With a major building now well outside the town walls, people began slowly building in the area

between the palace and the old town boundaries. This space soon became a neighborhood known as Al Foota, mainly comprising palaces for the royal family and their entourage (Al-Hathloul 2017). Al Murabaa' Palace was further significant because it marked the first time that motor vehicles were used to facilitate the construction process (Al-Hathloul 2017). Nevertheless, until 1948, Riyadh remained a small, isolated town in the middle of the Arabian Peninsula. Economic life in Saudi Arabia was simple, predicated primarily on traditional agriculture and nomadic pastoralism, which promoted a pattern of small, scattered villages and towns. And since almost all economic needs of the population could be satisfied locally within these small agglomerations, there was little to encourage movement to cities. Without major urban areas, until the early 1950s, the urban population of Saudi Arabia remained only about 10 percent of the country's total (Alkhedheiri 1991).

Fig. 1-1: Al Murabaa' Palace as it appeared in the 1950s. Source: CSBE.

By the mid-century, therefore, Riyadh's physical size remained limited to an area of around 3.5 km² (Al-Oteibi, Noble, and Costa 1993) (Fig. 1-2). It was inhabited by only about 50,000 people, living at the same density as in 1902. In her discussion of Riyadh at that time, Roxy Binno (2003) has identified how social factors played a paramount role in patterns of spatial organization. Most significant was the need to facilitate the practice of five daily prayers, which meant that all residents needed access to multiple spacious mosques. It was further crucial that privacy and segregation be preserved between men and women. Building, street, and plaza designs thus followed traditional Arabic typologies, which emphasized the presence of spatial transitions and filters between public and private domains. Binno further identified clan and kinship ties, extended family structure, and neighborhood relations as crucial factors shaping the city.

Fig. 1-2: Map showing the extent of Riyadh in 1950. Source: Arriyadh Development Authority.

During this period, there is no doubt that Riyadh reflected the country's larger attitudes. As a new nation, Saudi Arabia's most important priority was stability, which could best be promoted by keeping towns small and isolated. The country likewise had few ambitions beyond its borders, and its economic resources were limited — a condition reflected in the fabric and size of its cities. In 1952, however, Riyadh reached a major turning point in its history. It was in that year that the newly crowned King Saud, eldest son of Saudi Arabia's founding King Abdulaziz, declared that Riyadh would become the country's new capital, replacing Jeddah on the Red Sea coast; and he ordered all government agencies to relocate there within two years (though the process actually took four) (Fadan 1983). In addition, the rapid development of the country's oil resources led to massive job growth, the expansion of related government ministries, and increased wealth. All these trends led people to migrate to Riyadh in search of economic opportunity, and the city witnessed the beginning of a massive construction boom. Multiple projects were initiated simultaneously, at a scale that was unprecedented for a previously small city.

The decision to name Riyadh the capital, combined with Saudi Arabia's rise to prominence in the post-World War II oil economy, changed the landscape of the city forever. Fundamentally, it transformed a small town with previously limited ambitions and linkages to the outside world into the focal point of a newly prosperous country. From this point on, according to Archis (2010), "The shape-shifting form of the city was a physical manifestation of Riyadh's ascending aspirations, literally indexing the burgeoning city-nations' centralization of power and socioeconomic modernization." Pascal Ménoret (2014) described how the old town walls were knocked down in the 1950s to accommodate urban expansion, and how streets became increasingly wider and straighter to accommodate use by newly popular automobiles. Likewise, the first "long" road was built in 1951, connecting Al Nasserya to the old town, and the same year a railroad line connecting Riyadh and Dammam was built. It was during these years that the modern Riyadh truly began to emerge (Alfaisal, 1977).

In the two decades before Riyadh was designated the new Saudi capital, its rate of population growth had been less than 5 percent per year. But in the twenty years that followed,

between 1950 and 1970, the city's rate of population growth nearly doubled to 8 percent (Garba 2004) (Fig. 1-3). By 1968, Riyadh thus had a population of more than 300,000, and its urban footprint had reached 24 km², extending to the airport, 8 km from its center (Aina, Van de Merwe, and Alshuwaikhat 2008). Altogether, from 1930 to 1968, the population increased elevenfold, while the urbanized area grew even faster — by more than 280 times (Archis 2010) (Fig. 1-4).

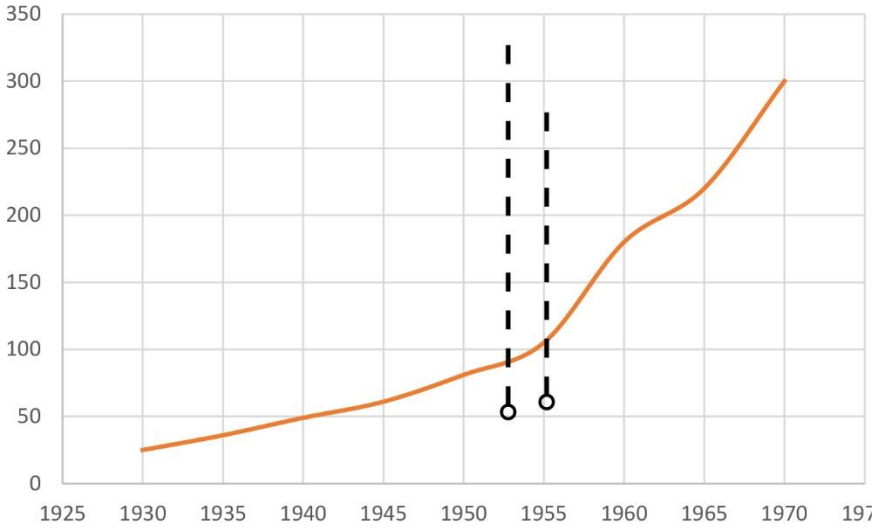

Fig. 1-3: Riyadh population growth. Source: Al-Ayyaf 2015.

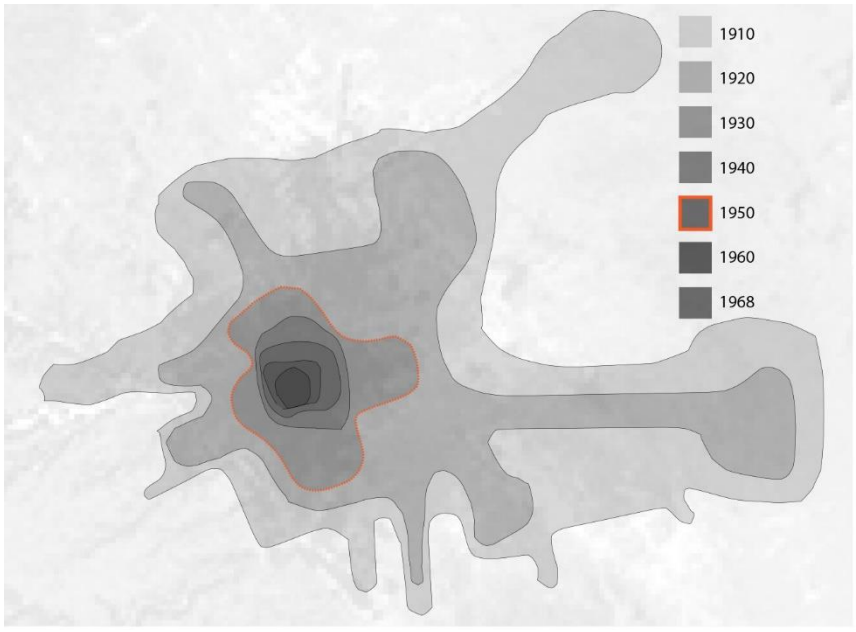

Fig. 1-4: Riyadh's territorial expansion. Source: author.

During this time, Saudi Arabia's population increased due to both natural growth and international migration. Riyad's growth, however, was predominantly attributable to internal migration. Indeed, the whole country experienced a rapid migration to urban centers, and Saudi

Arabia's urban population increased from 15 percent in 1963 to 45 percent in 1974. As the new capital, Riyadh was a major focus for this demographic surge: by 1972, 70 percent of its annual growth was due to migration, and it was estimated that 85 percent of household heads in the city were migrants (Alkhedheiri 1991). Notably, in 1968, rural migrants came to outnumber the city's original urban residents, constituting 54 percent of its population. Yet, at this time, most city functions remained in the central core (85 ha), which was also the area where new government ministries had been built. This core extended to the east to reach an industrial area, while the rest of the city was composed of fairly low-density residential neighborhoods.

Between the start of the transformation, in 1952, and 1968, when DA was hired to begin work on its master plan for the city, many projects were initiated to accommodate the city's stunning growth. These were located largely arbitrarily in different parts of the city, without a framework to govern their location. Developers from all over the region began construction simultaneously, and the pace of urbanization increased exponentially. Without a cohesive plan or a larger legislative framework, the result was a combination of individual projects with little awareness of their impact on the area or the need to coordinate common services.

Aware of these challenges, the Saudi government took a number of tentative steps to manage and direct this growth. The first was to create a Directorate of Municipality in the Ministry of the Interior in 1953, which was upgraded in 1962 to a Department of Municipal Affairs. The establishment of such a central planning agency was a move in the right direction, but far more still had to be done. According to Archis (2010), "growth [had] outpaced management." Shaibu Garba (2004) has thus described how the fundamental challenge was to develop institutional frameworks for management in the face of rapid growth and an increasing demand for services. Meanwhile, according to Ménoret (2014), the mayor of Riyadh at the time, Prince Abdulaziz bin Thenayan, was lamenting that, "Many people are building everywhere. They ask for permits, which they are given, but we do not know whether they should really build there, or whether they should go higher up. I cannot stop the people, there are no regulations, no zoning."

In response to this situation, the idea of a comprehensive city master plan was conceived. It was obvious to government officials that development rates were soaring, yet a framework and strategy for coordinating this growth and controlling its impacts were largely absent. Thus, in December 1967, the Saudi Department of Municipal Affairs signed a contract with DA to address these concerns. The firm was initially commissioned to engage with the problem of urban growth countrywide. But its clear focus was the challenge of Riyadh.

B. Literature Review

In the years since it was implemented, much has been written about the DA plan for the city. A significant portion of this work blames the plan for establishing an underlying basis for the city's more dysfunctional qualities. Indeed, it is common these days to blame most of the city's misfortunes on the 1972 DA plan and on the urban theories of Doxiadis that were central to it. In particular, Riyadh's heavy dependency on automobiles and its lack of human scale — popular topics of discussion in the last two decades — are now commonly considered a direct result of the 1972 plan. Other contemporary concerns such as the inadequate treatment of climate, a lack of local character, and the abandonment of the old city are likewise attributed to the DA proposal.

Today, these associations are prevalent not only among scholars and professional designers but among residents of the city, as is evident in public discourse and postings on social media platforms.

One of the purposes of the present work is to challenge the culpability of the plan in creating these conditions. Toward this end, it points to a tendency within existing scholarship to mistake the scope and purpose of the plan. But it also proposes that Doxiadis himself is in many ways a misread figure.

What follows is a brief review of important literature that crystallizes this standard view of the plan as the primary agent for establishing problematic aspects of the city's later growth. It is this view that this dissertation ultimately seeks to challenge.

It is no understatement to say that the prevailing view of DA's contribution to Riyadh is largely negative. Typically, scholarly and professional literature focusing on Riyadh's growth credits the 1972 DA plan as having a powerful effect on the city's trajectory because of the critical moment at which it was produced. But beyond this, the fact that almost all scholarship focused on Riyadh or Saudi cities includes mention of the DA project may also be seen as a mark of its enduring legacy. In work from a variety of vantage points, the plan may either be addressed in a designated chapter or described in a paragraph or passing reference to its proposals, which are now fifty years in the past.

This scholarship typically adopts one of two prevailing attitudes toward the plan. The first and most common largely dismisses the complexity of the situation at the time the plan was produced, and avoids analyzing or explaining it in relation to larger dynamics and forces. After a narrow investigation of origins and context, this view then typically positions the plan as a scapegoat, making it a target for criticism as a cause of the city's current challenges. Because the plan was so influential and appeared at a critical moment in the city's history, those adopting this view further often seek to connect the contemporary urban problems of Riyadh to the larger theoretical work of Doxiadis — whether that connection is thoroughly made and robust or (as is often the case) not. To this way of thinking, Doxiadis, the man, may be held liable for all matters related to the development of the city — as if the master plan produced by his firm in 1972 was implemented in a vacuum, and as if it was created as an abstraction and applied faithfully to the exclusion of all other social, political, and economic forces.

As an alternative to such a simplistic approach, the second attitude is less hostile to the work of Doxiadis and his firm. Nevertheless, its proponents typically stop short of defending the 1972 plan. Instead, they approach the problematic aspects of the city's growth since 1972 in a neutral manner, considering the plan in general without analyzing its specifics in enough detail to arrive at a clear view of its impact. Such a shallow treatment, referencing facts and avoiding judgments or analysis, helps avoid creating a larger conflict with the more numerous doubters in the first group.

What the present work hopes to provide is a third approach, one that is (almost) absent. This is to discuss the plan thoroughly, connect it to a larger understanding of the dynamics at work at that time, and acknowledge the project's intricacy and its different layers. It will thus seek to rediscover how many aspects of the DA plan were well suited to the circumstances of the time and

show how these were largely subverted or ignored as the city's development accelerated in later years and decades.[1]

A prime example of the first attitude in recent times is the work of Pascal Ménoret, particularly his 2014 book *Joyriding in Riyadh: Oil, Urbanism, and Road Revolt*. The book offers an anthropological account of a social phenomenon (joyriding) as a form of political resistance. Its main argument is that the promotion of roads and automobile use were conceived by the Saudi state as tools to establish market discipline, introduce new social norms and a culture of modernity, and depoliticize the Saudi population. However, those same tools were later transformed by joyriders into instruments of confrontation with the state, in the process constructing an alternative public sphere.

While the title and main theme of the book spotlight the narrow phenomenon of joyriding, its account of Saudi Arabia's urban transformation is thus considerably wider, and it conveys many insights on the political dimension of city-building as a process. Specifically, it considers Riyadh's urban growth and development as the purposeful creation of the Saudi state and a privileged ruling elite. As a tool for political control and economic advantage, in Ménoret's perspective, "development meant depoliticization." And it is within this framing that the book seeks to reveal how the practice of joyriding offers an outlet for political rebelliousness and a way to redefine spaces in the face of official networks of power. As part of this investigation, the author also explores poems, videos, and other forms of popular conduct from a political perspective, contending that, for Saudis, they are forms and expressions of political struggle.

The book is controversial a number of respects, but because of its urban focus, it treats Doxiadis and his firm's 1972 plan for the city extensively in two chapters, one examining Riyadh's urban history and the other previous patterns of territorial development. Ménoret's argument is that the city's framing according to abstract modernist principles, mainly fashioned according to the ideas of Doxiadis, created an urban milieu in which the only public domain available for political expression — that devoted to the automobile — could only be reclaimed from state control through an activity such as joyriding (Fig. 1-5). However, one of the book's many deficiencies is its reliance on a supposed connection between urban form and political intent, which results in weak analyses and forced connections to the actual origins of the built environment. As a consequence, the central thesis, that the built form of the city was deliberately constructed by the Saudi state to advance its own political agendas, seems forced and inadequately documented.

[1] The only piece I am aware of that defends the work of Doxiadis in Riyadh even mildly is a short (two-page) 2002 article by Dr. Zahir Othman, titled "Doxiadis, the Defamed." Here Othman argues that, despite its many shortcomings, the plan was a timely exercise that was produced at a moment when the city needed it the most, and that it responded to the city's most urgent challenges.

Fig. 1-5: Joyriding in Riyadh. Source: Ménoret 2014.

The book's argument in this regard begins by acknowledging the major role played by Doxiadis and his firm in shaping the future city. Indeed, it states that "the Doxiadis master plan formed the backbone of Riyadh's development and provided most of the notions central to the organization of the city's space." Yet, it then over-scrutinizes the DA plan, and instead of limiting its examination to the way the layout of the present city encourages the activity of joyriding, it overplays its importance as it seeks to scapegoat the plan as the source of almost all adverse aspects of the contemporary city. As if the plan were created on a blank canvas and implemented exactly as it was conceived, the book argues that DA plan not only led to the present inadequacy of Riyadh's urban morphology, but was also a primary cause for many of the larger political, economic, and social shortcomings of present-day Saudi society. For instance, Ménoret writes that "far from Doxiadis's dream to help produce a society of free individuals, the master plan helped Saudi elites streamline their domination." He thus suggests that the DA plan was a root cause for economic inequality, racism, classism, political dominance, social alienation, and almost any other adverse condition that characterizes life in Riyadh today — in addition, of course, to joyriding.

As I mentioned above, this attitude is not unique to Ménoret. Instead, the book is emblematic of a theme within present-day scholarship on Riyadh, which is to blame almost every trend that has emerged in the city over the last half century on the DA plan. Another significant example of this view can be found in Abdul Aziz Abdullah Alkhedheiri's (1991) work "Urban Infill: A Rational Policy for Land Use in the Kingdom of Saudi Arabia," which explores the urban environment of Riyadh as a physical product of the DA plan. Such a view is also evident in Charles L. Choguill's "Developing Sustainable Neighborhoods" (2008), which analyzes the role of the DA 1972 plan in the development of Riyadh's neighborhoods.

The above trend in scholarship about Riyadh's urban condition is clearly the most dominant today. By comparison, the second tendency mentioned in the introduction to this section purportedly embodies a more nuanced approach. Yet while scholars who adopt this second stance recognize the underserved skepticism with which the first group approach the DA plan, they choose to dodge these views rather than confront them directly. To maintain such a stance, however, they must largely avoid critical engagement with the plan itself, and instead present it neutrally in terms of facts and information, with little in terms of analysis or assessment.

An influential voice within this second group is Saleh Al-Hathloul, arguably the most prominent scholar in the field of urban research on Saudi Arabia, who has written extensively about its cities at different stages of their development. Two of Al-Hathloul's many publications, chosen from very different periods of time and on different topics and scales, may be seen as representative of his approach and the larger intellectual trend they exemplify. The first is one of his earliest articles, "The Evolution of Urban and Regional Planning in Saudi Arabia" (Al-Hathloul and Anis-ur-Rahmaan 1985). This describes the foundation and progress of urban and regional planning in Saudi Arabia by dividing it into two main historical stages — prior to and post-1970. In the first era, planning was immature and chaotic, while in the second, it developed to be comprehensive and holistic. Thus, "as compared to the rather ad hoc, incremental, approach adopted during the (first era), the (second era) pursued a holistic approach in planning. . . ." The second, more recent, article by Al-Hathloul, "Riyadh Development Plans in the Past Fifty Years" (2017), discusses the growth of the city from a small town before 1950 to a sprawling metropolis today and examines the master plans that shaped this growth.

These two articles are representative of Al-Hathloul's overall intellectual approach. On the one hand, they are very informative and beneficial in understanding the growth of Saudi cities, and they provide a wealth of recorded information and detailed historical accounts of this (largely undocumented) growth. However, on the other, they avoid controversy and exhibit some clear limitations. The first article thus explains that it was not coincidental that the moment of transformation in planning practice in Saudi Arabia largely coincided with Doxiadis's engagement with the city. Yet, the article largely avoids critical engagement with the 1972 plan by his firm. It thus presents little analysis of the plan's effectiveness and usefulness, and it largely ignores its connection to nonphysical dynamics. Instead, the DA plan is presented neutrally in terms of information and data as a technocratic initiative that came at a specific moment in time and achieved some physical goals. Likewise, in the second article, Al-Hathloul presents the DA plan as one of many plans that were implemented at different stages in the city's development, with little concern for its degree of influence or discussion of its efficiency and/or inadequacies. Both articles avoid critically engaging with the DA project. Rather, they provide a record of the plan and present information on it, but they provide little analysis or discussion of its details. Both articles solely ask what happened, instead of combining this level of investigation with another asking why certain initiatives were pursued and how these did or did not complement other forces/dynamics/contexts at play at the time. As a result, Al-Hathloul's handling of issues of urban growth reduces the city to a mere physical creature. This means that rather than accounting for the many other factors that have influenced the development of Riyadh (and Saudi cities generally), physical growth is isolated and analyzed in a vacuum. This does, however, allow the articles to assume a neutral position with regard to the 1972 plan, shying away from confrontation with those who might seek to target it as a source for all the city's present-day urban ills. The articles thus present facts and information on the plan, but without unfolding its complexity or understanding its different layers.

A number of other scholars have produced works that discuss the DA plan in a manner that aligns with Al-Hathloul's. Among them are Faisal Mubarak and Saud Al-Oteibi. Mubarak, whose work includes "Urban Growth Boundary Policy and Residential Suburbanization in Riyadh" (2004), has written extensively on urban development in Saudi Arabia. In this work, he has described the evolution of different forms of development in Riyadh as a process of "suburbanization." The central government, Mubarak claims, is at the center of the conscious process which created this massive sprawl, using laws and policies as instruments to attain certain

goals. Another notable article that takes this approach is Al-Oteibi's "The Impact of Planning on Growth and Development in Riyadh, Saudi Arabia, 1970–1990" (Al-Oteibi, Noble, and Costa 1993). Its purpose is to describe different planning procedures that emerged in Riyadh at the moment of its most rapid expansion, between 1970 and 1990. Interestingly, the article suggests that despite the unprecedented growth that occurred during those years, planning efforts were sufficient and addressed urgent requirements adequately. Similar to Al-Hathloul, and in line with almost all the literature dealing with Riyadh's urban growth, both Mubarak and Al-Oteibi include discussion of the DA plan and its role in Riyadh's urban development. Yet, both accounts treat it in a brief, reductionist manner, and they engage with its details in a shallow, uncritical manner that fails in uncovering its complexity.

Within this second trend, another important work is Deborah Middleton's "Growth and Expansion in Post-War Urban Design Strategies: C. A. Doxiadis and the First Strategic Plan for Riyadh Saudi Arabia" (2009). This provides a thorough and detailed analysis of Doxiadis's engagement in Riyadh, one that focuses both on the DA project as a professional exercise and an outgrowth of Doxiadis's extensive body of theoretical work. Middleton also evaluates the 1972 plan in terms of circulation, expansion, and efficiency.

With regard to these previous scholarly efforts, the goal of the present work is to provide a third view, one that seeks to arrive at a more nuanced and balanced assessment of the weaknesses and strengths of the project. Accordingly, it seeks to avoid examination of the DA plan as if it appeared in a vacuum with little connection to internal and external dynamics. Rather, it seeks to ground the project in multiple contexts and present it as the outcome of ongoing movements and conditions both within Saudi Arabia and globally. Saudi Arabia went through massive transformations in the years prior to the selection of DA to create a comprehensive master plan for the city's future growth. Therefore, to discuss the plan as if stripped of any local Saudi agency is to deprive present-day interpretation of valuable insights. The analysis of any plan must take into account its context as well as the circumstances of its creation. Furthermore, the outcome of the 1972 effort would clearly have been different if it had taken place at a different location. To arrive at a more holistic understanding of the plan, it is likewise critical to understand Doxiadis's own ideals and beliefs — his perception of the positioning of a capable planner, his definition of an ideal city, and other concepts. This dissertation, thus, does not look at the plan in isolation but studies it as it was situated within many other contexts and forces, much like other events in life. It considers both its limitations and strong points, and it discusses the evolution of the plan and its impact over time, analyzing it as a continuous living endeavor.

C. Methodology

It should be clear by now that this dissertation attempts to address a qualitative question. By arriving at a holistic understanding of the 1972 DA plan for Riyadh, it hopes to facilitate a new, multilayered view of the plan as the basis for an objective appraisal of its historical effects. To understand the full trajectory of the DA master plan means studying it not as a stand-alone entity, but in the context of the conditions of its creation, its inherent dynamics, and its underlying motives. Toward this end, research for the dissertation sought to evaluate existing literature and material related to different theories and contexts, as well as to employ a variety of methodological

approaches. Through the duration of the investigative work, numerous field visits and interviews were conducted, archival material was retrieved and studied, maps were analyzed, observations collected, and media examined. The research also depended on the collection of oral histories from a number of sources. I will expand further on these tools in the coming paragraphs.

The primary research was conducted in the period between 2016 and 2021, although it also drew on work undertaken between 2014 and 2016 (Ayyaf Al Mogren 2016). During those five years, from 2016, I visited various locations and employed a variety of methods. Two visits were made to Athens, Greece — in June of 2019 and August of 2021 — to gather information on Doxiadis, his theories and early life, and on the master plan for Riyadh produced by his international planning firm DA. In Greece, I conducted archival work, interviews, media analysis, and gathered and analyzed secondary data. Much of my research was also conducted in Riyadh, Saudi Arabia. Furthermore, during my period of fieldwork, I spent time on the east coast of Saudi Arabia, investigating the Arabian American Oil Company (Aramco) and its role in the development of Saudi Arabia. Finally, in the United States, I spent considerable time exploring resources available through the University of California, Berkeley, and I visited the Avery Library in New York, NY, and the Francis Loeb Library in Cambridge, MA, retrieving archival materials and conducting interviews.

Archival research was a big part of the work for this dissertation because the personal investigation of original sources allowed me to form some of my best perceptions. I began this work in Greece, where I spent two separate periods extensively investigating material in the Constantinos A. Doxiadis Archives, hosted by the Benaki Museum in Athens. The archives contain virtually all of Doxiadis's original texts, projects, drawings, and photographs, as well as the full body of his correspondence, professional memoranda, and notes. This includes an extensive collection of material on Doxiadis's work in Riyadh. Access to the Riyadh archives allowed me to analyze not only the official papers of the Greek and his firm with regard to the city but also informal material related to their efforts. Correspondences between Saudi officials and DA team members, minutes of meetings, unapproved proposals, and early drafts were all accessible, as was communication between the DA team based in Riyadh and the DA head office in Athens. This wealth of material helped guide other aspects of the research as part of an overall effort to establish a comprehensive understanding of the DA project in Riyadh. Most of the material was in English, but in terms of understanding the few sources that were in Greek, the aid of a local translator was of immense value.

Archival material regarding Aramco was analyzed for this research, too. I was able to access this material at Aramco's headquarters in the Eastern Region of Saudi Arabia and at the King Faisal Center for Research and Islamic Studies, located in Riyadh. The time I spent at the King Faisal Center was especially important in terms of understanding Aramco's involvement in the early days of oil exploration in the kingdom. Historic documents available there included maps, images, reports, and media coverage from that period. The archives of Riyadh's Municipality and the RDA (Riyadh Development Authority[2]) contained further useful material. This material is mostly focused on the growth of Riyadh, and it offered a picture of the city both prior to and after Doxiadis's involvement. It also contained beneficial papers on subsequent master-planning efforts in Riyadh since the 1972 plan — mainly the MEDSTAR plan. The material in these archives consisted mostly of plans, reports, and studies, but included some images and raw data as well.

[2] As of 2019 known as the Royal Commission for Riyadh City.

Last, the Avery Library in New York provided some worthwhile archival material on Doxiadis's and Aramco's involvement in the country.

One of the most significant obstacles faced by this research involved a shortage of written records in Saudi Arabia during the 1970s. Personal interviews proved to be a crucial instrument for filling this gap. They were also useful to gain a qualitative understanding of the situation. Most of the interviews were conducted in a semi-structured manner, according to which a few formal questions were asked in hopes of triggering and guiding a larger discussion. The advantage of this strategy was that it allowed for open-ended answers that might open new doors and lines of inquiry. All of the interviewees gave prior consent to being interviewed and were clearly informed of the research, its goals, and what their contribution would be. Most of the interviewees were recruited through personal connections, and in this regard my own connection to the city and the research topic was extremely fruitful (a further discussion on this point will follow in few paragraphs). Most of the interviews were conducted in Arabic because it was typically the interviewees' primary language. However, several interviews were conducted in English, mostly when the interviewee was a non-Arabic speaker. In total, for the purpose of this research, I conducted interviews with 23 different individuals, but in the majority of cases I met with interviewees more than once. The average interview duration was an hour and twenty minutes, with the longest interview lasting four hours (Fig. 1-6).

The topics of interviews varied widely, although the most common approach involved discussions of the growth of Riyadh in an attempt to arrive at a complete understanding of the city's transition through the years. One group of interviews was conducted with senior Riyadh residents who had lived through the transformation of the city, and these helped greatly to establish a clear image of Riyadh through the decades. Another group of interviews sought to understand Doxiadis's project. These were conducted with a combination of interviewees: residents of Riyadh who had lived through the years of the DA project and were connected to it, experts who participated in some capacity in the work, and professionals who observed the work from afar in the city. Two additional interviews were organized with professionals who worked in Riyadh after Doxiadis. One of these individuals was in charge of MEDSTAR; the other was with an individual who had worked on a variety of other architecture and urban design projects in the city. The goal of these interviews was to understand through a professional lens how the city functioned subsequent to Doxiadis's departure. A group of six city officials were also interviewed, including three former mayors, to incorporate official views into the research. These interviews sought to establish not only how city officials perceived the plan as it was being devised, but how the city continued to evolve and be governed in succeeding decades. A few additional interviews focused on understanding Aramco's role within the Saudi context. These discussions were with Saudis who had worked in the company during the 1960s and 1950s. Finally, four interviews were conducted to gain a better view of Doxiadis as an expert and to flesh out his professional position in the Riyadh project. This group of interviewees included people connected to the Greek, including a relative, a foreign expert who worked directly with him, and others who collaborated with him.

Fig. 1-6: Rassem Shaath and the author after a long interview in his office in 2019. Shaath was the Riyadh municipality's principal engineer during the 1960s and 70s. He was part of the team that commissioned Doxiadis, and he worked with the DA office in the city. Source: author.

An additional important source for this research was the second-hand analysis of oral history accounts. Oral history is a modern methodology where an informed interviewer engages in spontaneous conversation on a specific topic with a knowledgeable interviewee. The Regional Oral History Office of the Bancroft Library at the University of California, Berkeley, was extremely helpful to me in this regard. I have used their collections as an important source, particularly in analyzing Aramco's involvement in Saudi Arabia. Many of these interviews were conducted by Carole Hicke in 1992 and 1993 and have been transcribed and gathered into a large publication titled *American Perspectives of Aramco, the Saudi-Arabian Oil-Producing Company, 1930s to 1980*s. In particular, this document contains interviews with seven Americans who were involved with Aramco's early operations in the country, and the transcripts of them are dense, touching many aspects of urban development at that time. A large amount of time was spent at the library going through these transcripts and analyzing other documents. This work was particularly crucial to the discussion in Chapter 2, and it provided a basis for much of the analysis on Aramco and its attitude toward Saudi Arabia and Saudi nationals. Another valuable resource for oral history was the Center for Oral History and National Documentation, within the King Abdulaziz Foundation for Research and Archives. The research here specifically made use of the accounts of 25 Saudis who lived in Riyadh between 1930 and 1980, which were very descriptive and focused on the city and its social life. These Saudi accounts were effective in constructing an image of Riyadh through its development trajectory.

A variety of different representations, in different media, were also analyzed to understand perspectives on different issues, including the work of Doxiadis and his firm, the influence of Aramco, and the process of Riyadh's growth. Furthermore, extensive periods were spent during the fieldwork observing, analyzing, and studying the city. This last activity was extremely

worthwhile, because the iterative process of engaging in research, pondering the research questions, and examining the city in real time led to innovative insights and sentiments that are evident throughout the dissertation. The fieldwork also consisted of secondary data analysis from multiple censuses, reports, and plans, in addition to documentary and spatial analysis.

This dissertation primarily focuses on Riyadh, Saudi Arabia, which also happens to be my hometown. This had multiple positive implications. It afforded swift familiarity with the context, a deeper understanding of the conditions, and a historic firsthand record of the previous decades. It also eased many bureaucratic and logistical hurdles. But, most significantly, it granted me access to material and resources through personal connections and familiarity that would have otherwise been difficult to attain. However, this situation clearly also brought a measure of personal bias to the study, which mandated that I develop a new level of self-awareness. As a Saudi born and raised in Riyadh, I am aware that I hold many preconceived ideas and internal notions that have the potential to influence my frame of reference. However, this is a common problem in any research effort, especially ethnographic research in humanities fields. Admittedly, such efforts involve negotiating different layers of biases, which no endeavor of this nature can avoid. Indeed, as Hegelund (2005) has suggested with regard to ethnographic research, "There is no final, single truth and no distinct, absolute object of inquiry." LeCompte (1987) also observed that "Since the research in ethnography cannot eliminate biographical determinants, the makeup of the researcher [in all cases] is critical to the quality of any work done."

D. What Lies Ahead

In attempting to gain a deeper understanding of the DA plan for Riyadh, subsequent chapters will first discuss various conditions and contexts which affected the plan internally and externally, before examining it directly and critically dissecting it.

Following this introductory chapter, Chapter 2 will take up the topic of the Saudi Dream. Going back to the early days of the rapid, oil-motivated transformation in Saudi Arabia, it makes the argument that Doxiadis arrived in a country with leaders who had clear, predetermined vision of a modern, developed city and were using it for inspiration in the development of Riyadh.. That image was influential not only in forming the particulars of the plan but also deciding to offer the commission to undertake the assignment to Doxiadis and his firm in the first place. The chapter describes that image and follows its development from the early days of oil exploration in the 1920s until the late 1960s when DA began its work in the country.

The roots of this vision may be found in Aramco's early engagement with settlement-building in the oil-producing areas. Begun as a strictly economic endeavor, the Saudi-American oil behemoth soon expanded its role to become influential in forming the country's imagery and future ideals. Through various instruments and mechanisms, Aramco provided Saudis with a new image of a modern, developed city. Several of these — its camps, media outlets, and housing programs — are explored in the chapter.

The chapter demonstrates that this early image remained consistent and powerful in the Saudi context for decades. First realized within Aramco's own facilities, it was propagated to settlements for Saudis in the Eastern Region through the development of Al Khobar, and it later

spread to other regions of the country, reaching Riyadh in the 1950s. In Riyadh, the Al Malaz neighborhood became the perfect emblem of the vision, as discussed and analyzed toward the end of the chapter. These underlying forces were all manifest prior to the arrival of Doxiadis in Riyadh. Interestingly, elements of this vision were also essential to the work of Doxiadis and his planning firm. But the main point the chapter emphasizes is that as a model the Aramco image of modernity had already become tangible and concrete in Saudi Arabia by the time he started working there. Indeed, as the chapter argues, they may have been a significant factor in the Saudis selecting Doxiadis for the Riyadh master plan commission.

Much like the second chapter, Chapter 3 sets out to examine conditions that preceded the plan but were nevertheless influential in shaping its outcome. Where the second chapter looks internally at the Saudi context, the third thus explores exterior contexts. Specifically, it studies Doxiadis himself, and it seeks to ground his ideas and approach to planning in the subtleties of the field and evolving issues of the twentieth-century city in general. Doxiadis was entranced with the hopeful universalism of the Modern Movement and the prestige accorded to members of CIAM. Yet he was also conscious of the inadequacy of over-formalized urban schemes produced by modernist planners in the decades immediately after World War II. He thus positioned himself as a new type of modernist who could reconcile modernist traditions with the late-twentieth-century crisis of rapidly expanding cities.

The chapter explores some of Doxiadis's main planning contributions, including the theory of ekistics, which he developed as a proposal to guide global civilization toward a new urban future (Doxiadis 1968). The development of ekistics, which he described as a science of human settlements, was closely interlinked with his professional practice and helped guide multiple projects of DA through the years. The chapter also explores how many of Doxiadis's convictions were shaped as a result of observing the dreadful conditions of urban living in Europe that followed the destruction caused by two world wars. He thus came to believe that the world needed a new way to build cities quickly according to a blueprint that could combine the advanced ideas of modernism with the practicality and human quality that had marked older settlement patterns. He thus aimed to be a dreamer and a pragmatist at the same time. But in the 1960s and early 1970s this meant delicately balancing his projects to straddle a number of contemporary contradictions, such as advocating simultaneously for automobility *and* human scale, for order *and* freedom, and urban density *and* modern environmental concerns.

Key to this complicated stance was his belief that modernism's Achilles heel was its view of the city as a static product. His vision of the city was rather of a living creature, whose development he sought to promote through his concept of the Dynapolis (Doxiadis 1966). Employed as a continuously evolving model for his proposals for Riyadh and elsewhere, the Dynapolis provided a conceptual physical structure for a city that could expand indefinitely based on its changing needs and circumstances, without requiring that elements be continuously rebuilt. The chapter also illustrates another significant difference between Doxiadis's conviction of the planner's role and that of earlier modernists. To him, a capable planner was an enabler, establishing a spatial system and logic for growth rather than a builder who could think only in terms of specific structures. In general, the chapter thus describes the larger problems surrounding the design of cities at the time and the theories and practices developed by Doxiadis to respond to them. Like the view of the modern city already established internally in Saudi Arabia, these external factors and trends would greatly influence the production of the Riyadh master plan.

Following this discussion of context, Chapter 4 then turns to a comprehensive assessment of the 1972 plan for Riyadh. The plan is explained in detail, and many notions described as general concepts in the previous two chapters are described specifically in relation to it, including its emphasis on order and unity. Furthermore, it explains how Doxiadis's emphasis on scientific neutrality and data-driven analysis guided much of his firm's work in the city. Indeed, these qualities were key to its value both practically and as a way to establish its legitimacy. The chapter also describes how Doxiadis's view of the role of the planner as a provider of order and a director of growth rather than a master builder was translated into the specifics of the plan.

After discussing the early stages of the DA team's involvement in the Riyadh plan, the final project is also analyzed. This includes discussion of the main issues it aimed to solve, its main components, the major ideas it proposed, and its scope. Also explained are the relation of Doxiadis's main planning ideas concerning ekistics and the Dynapolis to specific features of the Riyadh plan, and how these were imagined as creating a structure that would be expandable and able to accommodate growth and change. Within this discussion, detailed analysis is given to the mobility network and to the structure of neighborhood organization, as these were the backbone of the plan and played a critical role in the system on which the Greek built his vision. The goal of the chapter is thus to afford the reader a complete understanding of Doxiadis's plan for Riyadh and to relate this understanding to ideas and notions presented in previous chapters to show how these contextual elements played a role in shaping it.

Following this descriptive chapter, Chapter 5 then turns to analysis, evaluating the plan from multiple perspectives in an effort to evaluate its lasting impact on the city. Typically, the plan is judged as a stand-alone project, and on this basis, it has been fairly criticized for many of its limitations. The chapter begins by describing these limitations and their negative impacts. However, the analysis also seeks to view the plan through another lens as a product of the contexts and dynamics presented in previous chapters. This allows an original reading of its many layers and effects that are rarely presented or discussed. Also important is a retrospective view, which allows a reading of the plan in light of what occurred subsequently in the city. Seen from these perspectives, it becomes apparent that the plan may not have been ideal, yet neither was it as bad for the city as has typically been suggested. In fact, despite its claim of scientific authority, it turned out to be both an imperfect and a prophetic endeavor.

It may be true that the plan's predictions for imminent growth were inadequate, and its design proposals were contradictory and, in many instances, imported and awkwardly fit to the actual context. As has been noted by others, this led to it being quickly outdated and outpaced by the actual growth of the city. The plan also contained numerous contradictions — heavily relying, for instance, on automobiles for mobility while seeking at the same time to preserve a sense of human scale and seeking to preserve the old town without really incorporating it into the fabric of new settlement. But the discussion seeks to reveal how these conflicting aims made sense within the context described in the previous chapters. Edward Said's (1978) ideas of Orientalism are cited as a way to better understand these seemingly contradictory elements of the plan.

Doxiadis was confident that his framework of theory could be relied upon to manage and account for these many contradictions. Considered from this perspective, it is logical in hindsight to arrive at the verdict that his solution was imperfect. While acknowledging the shortcomings of his plan, however, the chapter also presents an unconventional reading of the master plan, one that seeks to account for its continued relevance. This view is only possible in light of the understanding gained in earlier chapters of Doxiadis's ideals and vision, and through a better appreciation of the

context toward which the master plan was addressed. In this reading, the Greek urbanist did succeed in establishing a rational framework for the development of the Saudi capital over the next half century, one that has facilitated Riyadh's continued rapid growth trajectory within an unpredictable cultural, political, and technological milieu. This alternative view emphasizes the importance of the logic, mechanisms, and structures of the plan rather than its recommendations for the structuring of specific physical localities. The dissertation thus concludes that it is possible, in this light, to arrive at a more balanced and positive assessment of the plan's contributions to the later development of the city.

Chapter 2: The Saudi Dream

> *We [the Saudis] are the sons of the Indians who sold Manhattan, and we would like to change the deal.*
>
> — Abdullah Tariki

A. Introduction

While the DA master plan for Riyadh was the first official plan for the city, it was not constructed in a vacuum. Indeed, through the course of its creation, it was heavily influenced by ideas and imaginaries already established in Saudi Arabia. In this regard, the plan was a product of negotiations between ideas that Doxiadis brought to the process and notions and images already existing in the Saudi popular imagination. Among the most influential of these was the Saudi Dream (built upon the popular American Dream), a view of an ideal modern city development based on the mid-twentieth-century American suburb. This view had been introduced to the country by the Aramco, which had begun operations in the Eastern Province of Saudi Arabia in the late 1920s. However, by the 1950s, it had also taken root in other cities and towns, and Riyadh was no exception, as the message was delivered through planning for the Al Malaz district. This image, its construction in a postcolonial era, the trajectory and lineage of its subsequent influence, and the ability of Doxiadis to present himself as an agent of its further realization will be the topic of this chapter.

Although the population of Saudi Arabia gained independence from the Ottoman Empire after World War I, and although the country achieved its present status as a united kingdom in 1932, many aspects of its relationship with Aramco, and the United States government that stood behind it, were initially cast in a colonial mold. The chapter will show how for decades, the relationship between Aramco and the Saudi population was based on an Orientalist framework and an attitude of dominance, with the company consistently casting itself in a position of power and superiority. As the representative of Western capitalist development that would rescue Saudis from the past and lead them to a prosperous modern future, the physical environments Aramco constructed for its workers provided a model for progress. And, critically, Aramco's reputation for being a capable city-builder was contrasted with a stereotype of Saudi urban backwardness. Not only did Aramco create an image of what an ideal modern city was, but it also constructed a narrative according to which only Aramco was capable of building it.

This was a world that Doxiadis was already familiar with because of his education, his previous work in Islamabad and elsewhere in the developing Middle East, and his connection to the American foreign policy establishment through the Ford Foundation and other entities active in the advancement of the soft-power policies of the West during the era of the Cold War. Since before World War II, the complex relationship between the United States, Aramco, and Saudi Arabia had established a certain trajectory of development on the Arabian Peninsula. In hindsight, this must not only be seen as a significant influence on the DA master plan for Riyadh, but also the very choice of Doxiadis likely owed much to local perceptions that his firm would be the best agent to transform the city to fit the ideas and images of modernity that the Saudi people had been introduced to through the work of Aramco.

Aramco as hero and rescuer was an image so central to Saudi consciousness that it would remain powerful well into the twenty-first century. As an indication of its enduring strength, the next section briefly considers events from a much more recent time to emphasize the depth of its influence. The events demonstrate just how trusted the company's vision and expertise remain and how broad its influence has been in shaping Saudi urbanism and in designing and directing national modernization programs.

B. Historical Echoes

Every year, Jeddah (Saudi Arabia's second-largest city and its main port on the Red Sea) witnesses a month of festivities around the time of al-Hajj. Al-Hajj is Islam's yearly pilgrimage to the holy city of Makkah, and it occurs during the last month of the Muslim calendar year.[3] Attending al-Hajj is an obligation that every capable adult Muslim must fulfill at least once in a lifetime, and naturally, millions of Muslims flood Makkah each year to perform the necessary ceremonies. Being the closest large city geographically to Makkah, Jeddah functions as a gateway for travelers. In their white attire, crowds of worshippers arrive daily at this time by sea or by air. From Jeddah, it is only a short drive to Makkah.[4]

Typically, that time of the year is very festive for Jeddah and its residents; it coincides with one of Islam's two major holidays, and the city is proud of its role in facilitating one of Islam's major experiences. However, in 2009, the season of celebration was marred by disaster. Two days prior to the holiday, the city suffered one of the worst tragedies in its long history. On Wednesday, November 25, a severe rainstorm dropped a total of 90 mm of rain on it in the span of four hours — double its average rainfall for a typical year (Fig. 2-1). When the city's aging infrastructure could not manage the sudden inundation, the result was widespread flooding that officials described as the worst natural disaster in 27 years (*Saudi Gazette* 2009). Hundreds of lives were lost in the catastrophe; thousands of people were severely injured; and the economic impact, including loss of property, was too large to quantify (*BBC News* 2009).

[3] The Islamic calendar year, which is often used in majority-Muslim countries, is based on a lunar cycle, and consists of twelve lunar months, comprising a total of 354 or 355 days. Al-Hajj occurs annually in the last month of the year, Dhu al-Hijjah.

[4] In Islam, only Muslims are permitted to enter the holy spaces of Makkah. To control access to these areas, the city therefore has no airports. To reach Makkah one must travel to Jeddah by plane or boat, and then drive to the city, passing through several checkpoints — a trip that typically takes an hour by car.

Fig. 2-1: Jeddah street flooding, 2009. Source: *Al Rajol Magazine* (Alsadawi 2017).

Public sentiment after the tragedy was mixed, but one important realization was that Jeddah's infrastructure was substandard and inefficient. Public doubt also arose about the capabilities of the public officials and engineers responsible for the city's management. People had reason to be dissatisfied, and they directed their adverse sentiments in many directions (Murphy 2009). In response, the government of Saudi Arabia acted swiftly and assertively, and the late King Abdullah issued a royal decree that mandated a series of forceful actions. Among these was the formation of a high-level committee, chaired by the minister of interior, which was tasked with investigating the causes of the tragedy, evaluating existing conditions in the city, and ensuring that a similar event would never again occur (CW Staff 2011). The committee worked for several months, summoning a number of officials and collaborating with experts in various related fields. Finally, it released a report of its findings and recommendations in March 2010. (Fig. 2-2).

Fig. 2-2: The committee's chair explaining their findings to the king. Source: *Al-Eqtesadya Newspaper* 2010.

One of the major recommendations of the review committee — subsequently confirmed by royal decree — was that all responsibilities related to the infrastructure in question should be assigned to Aramco (*Al-Eqtesadya Newspaper* 2010). Aramco, the national oil company, would thereafter also be solely responsible for designing and maintaining adequate networks for flood-water drainage in the city. The Jeddah municipality was subsequently directed to hand over all of its previous studies, projects in progress, and budgeted funds for flood control, both in the present and in the future, to the giant oil company. Aramco began work immediately, and in the months that followed contracts were signed with a number of international engineering companies, whose representatives were deployed to the area (*Arab News* 2014). The danger of another, similar tragedy was perceived to be acute, and, in fact, while the company's initial work was ongoing, a similar natural event did occur.

Residents of Jeddah had sought drastic action to address the problems, and the announcement that Aramco would thereafter be responsible for flood control was met with great public relief and excitement (Al-Husane 2017). Such an attitude might be baffling to outsiders. Why would a multinational petroleum company be assigned the task of reviewing, constructing, and managing public work in such a completely unrelated area? What expertise and competence did it have in urban management and drainage infrastructure design? And most importantly, why was the news met with such relief and excitement? My view is that the decision had much to do with Aramco's reputation as an American agent of modernity and a savior of the Saudi people from their own backwardness.

It is impossible to understand the Saudi government's decision with regard to Jeddah in 2009, and the public's reaction to it, without understanding the context in which the process unfolded and the historical trajectory between Saudi Arabia and Aramco. What might not be clear to outsiders is that the government's decision leveraged the company's reputation for skilled management, top-quality work, timely project delivery, and comprehensive response. This was not the first time that Aramco had been summoned to oversee public infrastructure work. Within the last decade, it had been commissioned to construct stadiums around the country as part of a national plan to promote sports, and it had been tasked with building an enormous facility to address the country's shortage of educational venues.[5]

However, the real basis for the 2009 decision had been established decades before, when the company first became active in the country. Since then, it had orchestrated a certain dynamic in its relationship with the Saudi government and constructed a deliberate image of its competence and design prowess. That long-standing image, and the notions of modernity and progress that accompanied it, were the reason that Saudi citizens met the announcement that it would manage the Jeddah work with excitement and relief. Over the years, that image had provided a model for many urban development projects in Saudi Arabia, and it is within this context that this chapter explores the relationship between this position and the framing of the 1972 DA plan for the city of Riyadh.

[5] In 2009 the late King Abdullah wanted to focus on sports, and he instructed Aramco to build a sports city in Jeddah called Al Johara [The Gem]. It did so in only 390 days — but at a cost of US$590 million. Subsequently, in 2011, the company was tasked with building eleven more stadiums in different parts of the country. Unfortunately, the second wave of facilities has encountered financial and logistical difficulties, and have yet to all be completed.

C. Orientalizing Oil

The frequently quoted statement at the beginning of this chapter is attributed to Abdullah Tariki, the Saudi Minister of Petroleum and Mineral Resources in the early 1960s (Vitalis 2007). His words subsequently spread widely and are typically invoked today by Saudis to contextualize what occurred afterward — the gradual but drastic change in the role played within Aramco between Saudis and Americans. They thus highlight both the exponential growth of the company and the increasing control that Saudis have gained in its operations since the 1970s. However, for the purposes of this research, the quote is valuable for another reason: it helps us reflect today on attitudes surrounding the development of Saudi Arabia's oil resources prior to the early 1970s, particularly with regard to the dynamics of the relationship between American officials of Aramco and Saudi nationals. These attitudes were to have a profound impact on how the Saudi government would later approach the task of managing the explosion of the country's urban population in the last quarter of the twentieth century.

When oil was discovered in the Eastern Province in 1938, the trajectory of development in Saudi Arabia was changed dramatically. What had been, in economic terms, a largely backwater nation before World War II grew in a few decades to become the world's largest exporter of crude oil and a major player in the world economy. As one of the world's least urbanized societies before that time, it would also, half a century later, become one of the world's most urbanized.

From the beginning, the development of Saudi Arabia's oil reserves would be dominated by American interests. It had long been suspected that vast petroleum reserves were waiting to be discovered in the east of the kingdom near the Arabian Gulf. In the decade prior to 1938, seeking to gain a head start on other world powers, Americans had established themselves as leaders in the effort to discover and develop those reserves. Initially, this took the form of a 1933 concession from the Saudi government to Standard Oil of California (now Chevron). In the early years, this company managed its work there through a subsidiary, the California-Arabian Standard Oil Company (CASOC). But in 1936, another American company, Texaco, bought 50 percent of CASOC, and after the oil-exploration process was also recast as a joint Saudi-American effort, Aramco was born (Vitalis 2007).

Following World War II, exploration and production from Saudi Arabia's oil fields escalated rapidly. As the full extent of Saudi Arabia's oil reserves became known, Americans were also able to reap most of the profits because of their already dominant position in the new industry. But even before then, American families had begun to move into new homes in the Eastern Province, to join the husbands and fathers who had arrived there when a booming oil economy was a distant prospect. Seeking to provide all the comforts of home in a foreign land, the first Aramco camps and enclosed compounds had been created in the 1930s to host these American families.

Fig. 2-3: The late King Abdulaziz meeting with American leaders of Aramco during the 1950s. Source: unknown.

Today, of course, Saudi Aramco (as the company is now known) is one of the world's most valuable publicly traded companies.[6] But when oil was first discovered, the Saudi position within it was extremely weak. Indeed, Aramco was mostly owned and operated by Americans, and most of the company's profits were sent back across the ocean to the U.S. (Fig. 2-3). The Tariki quote at the beginning of the section is thus typically cited today to highlight the success of the Saudi government in changing the terms of this initially exploitive relationship through the course of the 1970s. Thus, in return for lifting an oil embargo instituted by Arab nations in response to Western support for Israel during the 1973 Yom Kippur War, the Saudi government first demanded that its share in the company be raised to 25 percent. This was followed by additional negotiations, and the percentage was increased to 60 percent by 1974, and 100 percent by 1980 (Anderson 1981).[7]

For the purposes of the present research, however, what is most important to note is that, prior to these agreements (and to a lesser extent the formation of OPEC on September 14, 1960), the Aramco–Saudi relationship offered a clear example of Orientalism in practice. Edward Said's 1978 book *Orientalism* — now regarded as critical to Middle East scholarship, especially in the social sciences — is indeed a useful lens through which to understand this distinction and the larger Aramco attitude. Said coined the term "Orientalism" as a way to describe, analyze, and denounce certain attitudes toward researching, understanding, and representing the cultures of the Middle East. According to Said, Orientalism was ". . . a style of thought based upon an ontological and epistemological distinction made between the orient [the East] and (most of the time) the occident

[6] In fact, at the time of its initial listing on the Saudi public market in December 2019, Saudi Aramco was for a time the world's largest listed firm by market capitalization, overthrowing Apple, the tech giant.

[7] It was Saudi Arabia that led other countries in creating what is now referred to as the 1973 "oil crisis." The action began in October, when members of the Organization of Arab Petroleum Exporting Countries proclaimed an embargo on oil exports to nations, including the United States, which had supported Israel during the Yom Kippur War. To move beyond that embargo, a renegotiation of ownership within Aramco was conducted between the Saudis and the United States.

[the West].” However, the book also made the argument that these attitudes had a political component. They were thus used by Europeans during the colonial era — of the nineteenth century, especially — to justify an inherently unequal relationship between the West and subject peoples. Orientalism in practice therefore could not be separated from the colonial culture that produced it.

To build this argument, Said unpacked the political, imperialistic motives that historically guided most Western accounts of, and attitudes toward, the Middle East, and the ways these were used to create a politically charged body of imagery. The book begins by tracing the roots of early Orientalist thinking to the formation of Islam during the European Middle Ages, when the new religion was consistently and deliberately positioned as a threat to existing Christian civilization. However, it describes how a second defining historic moment came with the Napoleonic invasion of Egypt in the 1790s. At this time, an imbalance of power between the East and West allowed Napoleon to make use of the production of knowledge to craft a cultural vision of the Orient that could be used as a tool of domination and control. Ultimately, this Orientalist vision presupposed an inherent difference between the familiar (the Occident, the West) and the strange (the Orient, the East), which was highlighted and exaggerated through cultural representations, creating a sense of confrontation between Westerners and the mysterious East. While these Orientalist attitudes were most deeply active as an element of French and British colonial conquests and administrative regimes in the Arab world, the book also shows how they evolved to provide a basis for American attitudes toward the region in the postcolonial era.

Throughout the book, Said eloquently illustrates how the same erroneous assumptions and myths have provided the foundations for a historical sequence of understandings (and misunderstandings) of the cultures of the Middle East. Thus, new stereotypes were built on old foundations, allowing Western experts to repackage existing arguments in new ways, even if those experts had never visited or met anyone from the region. Such an uneven relation of knowledge and authority was then used to create a tool with which to justify Western political dominance and the implicit subjugation of the Orient. According to Said, this typically allowed the Western voice to be present and clear, speaking for the Orient, while actual Oriental subjects were rendered voiceless. Such an attitude further promulgated notions of sameness, treating all subjects as one and eliminating differences and personal agencies. Once defined as Oriental, every other characteristic became secondary to an underlying dichotomy between East and West, in which the East was measured according to Western criteria. As part of this equation, the Orient was portrayed as uncivilized and backward — a timeless milieu that required the modern West to save and develop it.[8]

[8] Said’s work has been monumental in almost all fields of humanities. Urban scholarship on the Middle East had until then been dominated by generalities and sweeping assumptions of a generic Islamic City model. But Said transformed it to account for context-sensitive research that considered the varying nature of urban development in cities of the region. As Andre Raymond (1994) observed, “The doctrine of the Orientalists concerning the Muslim city and Muslim town planning fits naturally into the fundamental concept of Orientalism.” Janet Abu-Lughod (1987) also forcefully employed a Said framework to critique urban Orientalist approaches to the Muslim city, explaining its inadequacy as a general category. By tracing the roots of the concept in literature, she illustrated how a few selected case studies had been used to build general theories and concepts with little external validity, which were nevertheless consistently employed to understand every Middle Eastern city. Nezar AlSayyad (1991) has likewise critiqued the notion of the Muslim city, arguing that urban theorists typically emphasized religion as the most significant factor shaping their development, when many so-called Muslim cities were physical manifestations of much more complex, locally situated socioeconomic processes.

Using Said's theories as a lens through which to understand Aramco's presence in the country, it is possible to see that, while Aramco's endeavors in Saudi Arabia, like other neocolonial endeavors, were mostly motivated by economic gain, they also had political and social dimensions that transcended the purely economic sphere. The implicit relationship between Aramco and Saudi society thus had significant and widespread influence on other fields and industries. And for many years, this Orientalist-inspired dynamic was characterized by an attitude of American dominance and superiority and a clear distinction between what each party brought to the table: what was Western was considered to be superior and developed, and what was Arab was seen as backward and undeveloped. It was with this dichotomy in mind that the Americans in Aramco saw themselves as having been assigned the task of saving the undeveloped Arabs by introducing them to modernity.

Many attitudes within Aramco during the American-controlled era, from its foundation in 1936 until the nationalization process began in the 1970s, were deeply imbued with such an Orientalist vision. A massive historical enterprise, the work of Aramco has primarily been directed toward the exploitation of Saudi Arabia's oil resources for financial gain. But during its early years, Aramco's business operations, technological processes, and mode of interaction across cultures stressed a strict separation between Saudis and Westerners. As an implied justification for this dynamic, the company cast the Saudi nationals who worked for it in the role of an undeveloped, backward population. And it defined a crucial element of its mission in heroic terms as being to save this population and guide it toward modernity and development — as defined by Western standards (Fig. 2-4).

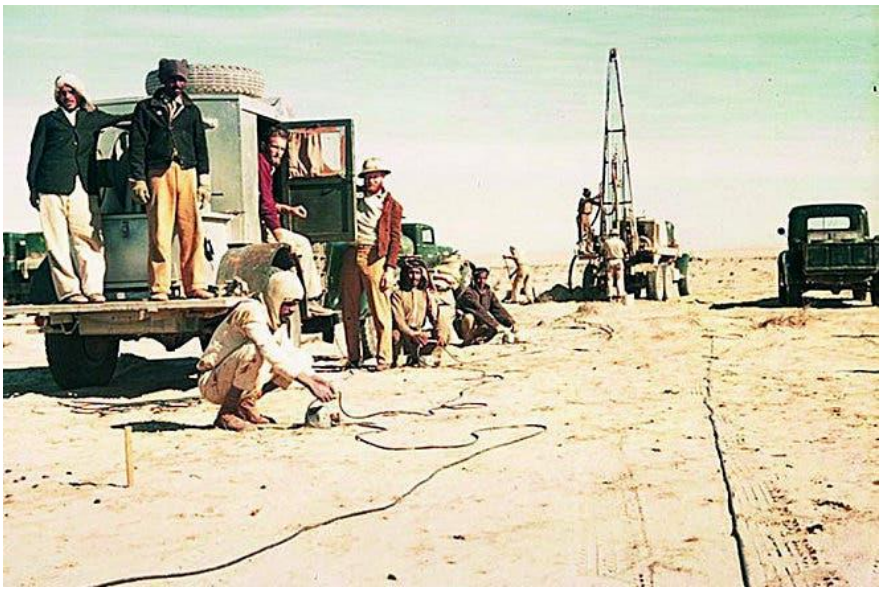

Fig. 2-4: An Aramco oil-exploration crew in the 1940s, with local guides and workers and Western engineers. Al Assaf twitter (@Mansoralassaf).

A clear illustration of this mentality and attitude may be found in Chad Parker's (2015) account of Aramco's early activities *Making the Desert Modern: Americans, Arabs, and Oil on the Saudi Frontier, 1933–1973*. According to Parker,

> *With the help of local Bedouin, who acted as guides, American oilmen confronted what they saw as an ancient, backward society as they probed the desert for riches. Soon after the discovery of oil in marketable quantities, American oilmen became the guides, ushering the kingdom into the twentieth century through various development schemes.*

According to this overarching "Aramcoian" attitude, daily decision-making with regard to the development of Saudi oil reserves would be the exclusive purview of company managers. Almost all these employees would be expatriate Americans, sent from the home office in the U.S. to manage the company's operations in the kingdom. The development of a strategic framework and the design of massive development projects would likewise be determined in the United States. Within such a neocolonial frame, Aramco's work exhibited two modes of practice: the development of strategies of design and control in the United States, and the execution of their specifics under the direction of expatriate envoys in the kingdom.

Parker's account also exhibits a strong Orientalist attitude in its descriptions of the local population (Saudis) as an irrational, psychologically frail, and feminized, non-European other. As might be expected, this view is contrasted to its opposite: the rational, psychologically strong, and masculine West (Americans in this case). As part of this Orientalist framing, the role of local Saudis in the discovery of oil was minimized so that this triumph could be reserved for Westerners. And to enhance the significance of Aramco's work beyond the mere generation of profits for Western shareholders, Parker described Saudi society using terms such as "ancient" and "backwards." The effect of such cultural constructions was to establish an uneven relationship, in which the West (Aramco) was dominant and powerful. Parker (2015) thus emphasized how "the miracle of American production relied on American employees who would help deliver civilization to Saudi Arabia."

Orientalist attitudes were also held by individual Americans who came to Saudi Arabia, and through their personal and professional interactions with Saudis, they established personal relationships that faithfully reproduced these larger "Aramcoian" dynamics and ideals. In 1992 and 1993, Carole Hicke conducted a series of interviews with seven Americans who were involved in the early operations of Aramco. These were transcribed and gathered into a large publication titled *American Perspectives of Aramco, the Saudi-Arabian Oil-Producing Company, 1930s to 1980s*. The stories and attitudes evident in Hicke's transcripts clearly illustrate the nature of American Orientalism at the time. Thus, while Aramco often boasted about employing Saudis and fully incorporating them into its operations, the reality was much different. In almost all respects, Saudis were treated as inferior to expatriate Americans, who enjoyed their superior position merely for being Western.

Anyone outside of Aramco would have seen its advertised image as a fully integrated company. It did, for example, employ a large number of Saudis, and the living conditions of these employees were greatly improved over what they might have otherwise been. But a closer look reveals that the Saudis, being "uncivilized," were generally regarded as unworthy of inclusion in higher-level projects. Indeed, most were limited to laboring positions, with little to no hope of advancing into the ranks of management or attaining a position of real power in the company (Fig. 2-5).

Fig. 2-5: Aramco's first training school, established in 1940 to train Saudis. Source: Aramco.

In terms of the extent of these Orientalist notions, one of Hicke's most revealing interviews was with Frank Jungers, who reached the position of chair and chief executive officer of Aramco. Jungers, born in North Dakota in 1926, held what *Fortune Magazine* called "One of the Most Delicate Positions in All Industry." He was also a key figure in Aramco's history, managing the company at a time of tremendous growth. Jungers served in the U.S. Navy before going to work for Standard Oil of California in San Francisco immediately after World War II. He was thus only 23 years of age when, in 1947, the company deployed him to Saudi Arabia for the first time. In his interview with Hicke, he did not hide his aims and aspirations for moving there — "it was the best job offer, financially, that I got." However, he was also extremely nostalgic when discussing Aramco. Indeed, he spoke fondly of it. Thus, he noted how, "the Arabs were, of course, not unfriendly at all, but most of them were very unsophisticated villagers or Bedouins that we hired to do labor work and to be trained to handle the full scope of jobs that exist in an oil company operation in a difficult environment. They were laborers, office boys, coffee boys, and so on."

Such comments provide a textbook example of the Orientalist attitude as described by Said, in which one can spot many typical individual tendencies and features. Thus, to Jungers, Saudis were unsophisticated villagers, only able to handle lower, simpler jobs. It also reveals what Said described as a "common attitude of sameness." Egyptians, Saudis, Lebanese, and nationals from other Arab countries were thus all just regarded as Orientals, and could be treated the same, without acknowledging their differences or special qualities.

Within Aramco, Westerners enjoyed most of the higher ranks and managerial jobs, and always occupied positions of power and control, even in unofficial settings. Jungers thus described how "We [Aramco] had too many foreigners in the good jobs — in the blue collar jobs at first and later in the white collar jobs, that the Saudis had been trained for and couldn't get because Luige was too good a man to lose and the Paki was too good a guy to lose and so on." This created a relationship of dominance between the two counterparts according to which the Western (American) was always superior to the Eastern (the Saudi), no matter what the actual capacities of either was. There was a clear hierarchy: if you were Arab, you were inferior; if you were a Westerner, you were superior. And with Westerners in all managerial jobs, company representatives could easily maintain a controlling attitude based on the supposition they were there to develop and modernize their inferior counterparts.

Despite this reality, Aramco was nevertheless able to create a reputation that it was fully integrated and that it was empowering Saudis. This image was crucial to the company's survival — not only to gain favor in the eyes of the local population, but also to gain the trust and support of the government. Through its announcements and media campaigns the company thus publicized an image of itself as the initiator of programs that would help Saudi Arabia advance to a higher level of civilization (Fig. 2-6). Not only would the company bring economic growth to the kingdom, but it would train Saudis in advanced fields such as engineering and management. As a result, the Saudi government warmly welcomed the company, met many of its needs, and supported it in many ways.

Fig. 2-6: Left: Saudis in Aramco's training program. Right: Aramco job listing in a local newspaper in the 1940s. Source: Aramco.

However, Aramco's essential Orientalist power structure remained in place behind the shiny, progressive façade. Robert Vitalis, in his 2007 book *America's Kingdom: Mythmaking on the Saudi Oil Frontier*, wrote that by 1949, despite all its training programs, Saudis were hardly ever considered for management positions, and their role within the company was limited mostly to industrial labor. Indeed, although training programs were advertised as a way to educate Saudis in technical fields, they were never really designed to prepare them for advancement. Rather, the intention from the top was to confine local Saudis and Arabs from other nations in the region to the working class, with little hope of promotion (Vitalis 2007). Statements by Jungers support this claim. As recounted to Hicke, for instance, he explained, "here [in Aramco] we had all of these people, and we were overstaffed, because we had all of these Saudis that we poured into training programs, and these Saudis weren't being utilized and promoted into jobs being handled by other nationalities. Saudis were resentful that they weren't given the jobs that they thought they could perform." Jungers, himself, saw how this created a problem:

> *[W]hen they were sent for training and they succeeded and came back, you had to give them a job that corresponded with their achievement. This was the part that was missing. Nobody had any trouble sending Ali Naimi to school, but what are*

you going to do when he gets out of school? Either he becomes a significant employee with a significant career or he becomes an embittered malcontent in due course.

Because of the company's pervasive culture of Orientalism, even though these ambitious men went through training and learned new skills, the fact they were local Arabs meant they were not given the jobs they deserved. Despite all the apparent goodwill and public image-burnishing, the power dynamics in Aramco were clear: as an Arab, you would always be assigned an inferior position, despite your personal abilities or aspirations.

D. The Aramcoian Dream

Perhaps there was no place where such attitudes of superiority (and the assumed role of Aramco as an agent of liberation) were displayed more tangibly than in the urban environments the company created. The importance of this context to this research is that the built environment created by Aramco, and the many images it cemented in the minds and visions of Saudis, were not only the context in which Doxiadis operated but also the tangible aspirations he was tasked to achieve. Aramco's ventures in Saudi Arabia were massive and required large numbers of employees to manage and operate. This meant that while Saudis were employed in sizable numbers (though mostly in laboring jobs), large numbers of trained foreign workers were also needed. Skilled expatriates flooded into the country from the U.S., Europe, and Asia, attracted by the allure of well-paying jobs. And to house these foreign workers, Aramco had to build housing compounds. Today, when these enclaves are considered together with their attendant services and amenities, they can be seen to have essentially amounted to private cities. They can also generally be seen to have fallen into three types: camps for American workers, camps for other foreign workers, and camps for local Saudis.

Fig. 2-7: The American Camp in Dhahran in the early 1950s. Source: Twitter (@desertlover79).

The first type of camp, known locally as "American camps," was built to be occupied by senior staff members and their families (Fig. 2-7). They were typically located close to an airport, American government offices, and a military base. Such camps were, by far, the most luxurious settlements built by the company, with a high level of amenities and services. They were also quite large, with some eventually reaching 11,000 inhabitants. Solon Kimball (1956) provided the following description:

> *No Westerner would have difficulty in identifying the senior staff "camp" as a settlement built by Americans in our southwestern tradition of town planning. It is an area of single-story dwellings for employees and their families. Each house is surrounded by a small grassed yard usually enclosed by a hedge. There are other plantings including flowering shrubs, low desert trees and, in some instances, flower gardens. Only in Dhahran is there a variation on the grid pattern of streets and irregularly shaped blocks. Streets are paved and frequently curbed and have night lighting. There are only slight variations between the recreational facilities of each senior staff camp. Each one possesses an auditorium that is also used as a movie theater and for amateur productions; a luxurious club with snack bar, bowling alleys, library, dining room, lounge, and terrace for dancing and social gatherings.*

From this description it is possible to see how these camps mirrored the form of a typical suburban development in such arid regions of the U.S. as Arizona, New Mexico, or Texas (Fig. 2-8). From their larger features (such as their villas and road networks) to smaller details (the naming of streets, for instance), they copied the logic and appearance of the suburban developments that were spreading rapidly across the United States at the time. Jungers, in his interview with Hicke, noted that "everything we had [in the camp] was shipped in the beginning. Nothing came from Arabia. There was insufficient food grown there to supply the workforce. Aramco had to set up office in Sydney, Australia, a purchasing operation."

Fig. 2-8: The Americanization of the Aramco camps. Source: *BBC News Mundo* (n.d.).

A recent Bloomberg article likewise recounted how these camps seemed as if they "could be any small town in America. Children travel in iconic yellow American school buses. Baseball

fields abound. The Boy Scouts have their own pack, number 253. Set aside the desert heat and this could be suburban Los Angeles" (Blas and Domoney 2017). An American teacher who worked in them suggested that living in one was "like living in mini America but in Saudi Arabia and making more money then you possibly could need!" (Rundell 2014).

The similarities to American settings were likewise not limited to physical features; social norms and governing systems were also imported from America (Fig. 2-9). Thus, schools taught U.S. curricula, and Jungers noted how "children had to speak English if they wanted to attend the schools and compounds. It was an American-oriented education because American children had to be prepared for prep school entrance." In her interviews with Hicke (1993), Elizabeth Arnot, the wife of Paul Arnot (the chief petroleum engineer and senior vice president of Aramco) and a longtime resident of Saudi Arabia, recounted the many similarities between the camps and her hometown. With regard to the camps at Abqaiq, where she lived for some time, she said, "there was a women's group, a garden group, scouts for boys and girls, and PTA was through school. Things that you would expect in a small town, they developed. And one year we had a summer recreation program for the children, and I taught cooking to a group of youngsters. Somebody else taught some girls dressmaking, and so on."

Fig. 2-9: The importation of suburbia. Left: the American camp. Right: the naming system of the streets. Source: left, unknown; right, *BBC News Mundo* (n.d.).

By tacit arrangement with the Saudi government, expatriate Aramco employees were also allowed to engage in activities and social practices that were banned or frowned upon in the conservative Saudi Arabian society of the time. For instance, while alcohol was prohibited in the rest of the country, it could be publicly consumed within the boundaries of this camp. And while women then were forbidden to drive anywhere else in Saudi Arabia, they were allowed to travel freely inside the camp. Concerts were banned in the rest of the country but were likewise allowed inside the camp. And men and women could mingle and share many spaces, as opposed to being socially segregated, as in much of the rest of the country.

Such Westernized patterns of life were not hidden from local and national authorities. On the contrary, government officials knew what life was like inside the American camps, but they realized that separate social standards were essential to senior expatriate staff. Their maintenance within the camps was thus considered crucial for the success of the company, and a dynamic of mutual understanding was put in place. As Jungers explained with regard to dietary restrictions, for example, "top management and the local police or provincial government had numerous sort

of unwritten, unwritten agreements that said, in the case of pork, if you import pork, it will come through customs as meat, you sell it in your store only to non-Muslims and you certify each sale as not having been made to anyone other than Christian Aramco employees" (Hicke 1993).

In contrast to these privileged preserves, as Aramco's activities in the country ramped up, it began to build a second category of camp to house non-American foreign workers. Such people were mostly of European and Asian nationalities, but also included non-Saudi Arabs. The largest number of such employees were Italians, Pakistanis, and Egyptians, and their position in the middle of the company's social hierarchy was translated into the camp's physical environment. These camps provided good living conditions, but were nowhere near as luxurious or glamorous as the American camps. According to Fadan (1983), since the majority of those who lived in them were single men, they were predominantly composed of barrack-type living structures. However, they also included some modest conveniences and recreational facilities.

The third category of housing environments created by the company were camps for Saudi workers, and their physical environments corresponded with the low-level laboring positions that most Saudis occupied. Their conditions were thus inferior in all aspects to both the camps for Americans and other foreigners. Furthermore, since Aramco's role in the process of setting them up was limited to organizing the layout of their streets and housing areas, it was assumed that the dwelling structures in them would mainly be self-built by the workers themselves using local techniques and materials (Fig. 2-10).

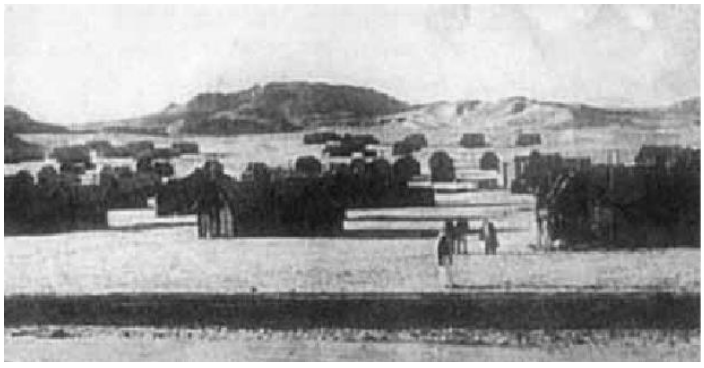

Fig. 2-10: The Saudi Camp. Source: *Al-Youm Newspaper* (1998).

"Early life in Saudi Camp was austere, without any amenities," according to Talib and Parssinen (1982). "Men, separated from their families for up to two or more weeks at a time, ate, socialized, and slept under crude barastis of woven palm leaves hung from wooden frames. Water was cooled in large clay pots, toilet facilities were informal, there was no power, and fires caused by candles and stoves were frequent." Moreover, there were few to no services or amenities, with the exception of a mosque in the camp center, which was built at the direct request of the king. Kimball (1956) described this category of camp as "one that was neither planned nor welcomed. To Western eyes it is reminiscent of the Hoovervilles of Depression days. Houses have been constructed of every conceivable kind of scrap material with a scattering of more traditional palm-

leaf native barastis, and an occasional substantial building of concrete block. . . . Here the employees, mostly Saudis, may bring their families."[9]

The way the camps were constructed, the environments they created, their features and divisions — indeed, the very existence of three categories of camp — were all clear expressions of Orientalist attitudes that Aramco held toward Saudis in their own country. A clear social hierarchy divided employees of the company into three distinct groups. At the top, the status of expatriate Americans not only affected the roles they held in the company but the design and form of settlements they were allowed to occupy and lifestyles they were able to enjoy. By contrast, Saudis occupied the lowest rungs in the established hierarchy, which meant that their camps offered the harshest environments, the starkest lifestyles, and the crudest services. As Said explained, the creation of such hierarchies was a common Orientalist strategy, used to demarcate differences between Eastern and Western populations. By dividing the camps along ethnic and racial lines — instead of seniority, rank, or some other means of categorization — the Orientalist would always be cast in a position of power, while the Oriental would be seen as subservient as a matter of course.

As Helen Lackner (1978) has explained, however, certain dynamics in the company started to shift toward the end of the 1950s, as pressure mounted to change such practices. One of these involved a move toward equality of professional opportunity. By that time, many Saudis had been sent by Aramco to the U.S. to receive training and develop their technical and managerial skills. And when these Saudis returned and applied for higher-ranking positions within the company, they found such advancement tough but no longer impossible. Despite better prospects on the employment side, however, they remained ineligible for company-provided housing outside the workers' camp. The Orient here was reduced to a single characteristic — being Saudi. Said thus suggested that a key feature of the Orientalist tradition was the creation of a large Oriental box, affording little room for personal specifics despite wide differences in local cultural practices. "No matter how much a single oriental can escape the fences placed around him, he is first an oriental, second a human being, and last again an oriental" (Said 1978).[10] To Aramco, therefore, no matter how skilled or ambitious they might be all Saudi employees were treated as members of a single group considered timeless and unable to develop or change. And even if they managed to climb the professional ladder, it would thus be inappropriate to consign them to residences elsewhere than in the workers' camp.

Despite efforts to stamp the image of Western superiority on their minds by dividing them into separate camps, many local workers refused to accept such an Orientalist perspective. Indeed, especially in the first few decades of the company's presence, many of these workers protested their position of inferiority. Lured to Aramco by the image of equality and the prospect of advancement, they were disappointed to find their position within the company limited. This resentment led to many acts of protest in the 1930s and 1940s, the most significant of which occurred in 1945 when about 9,000 workers went out on strike against the company's policies of racial discrimination (Parker 2015, Vitalis 2007).

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[9] "Hoovervilles" were shantytowns constructed in the United States during the Great Depression. They were named after Herbert Hoover, the U.S. president at the time, who was widely blamed for their creation. They are widely viewed today as having provided an abysmal level of shelter for many who became homeless at the time.

[10] Employing Said's framework, it could likewise be argued that the population of a large part of the world was defined at the time by one dominant character: being Muslim.

As reported by Vitalis (2007), before conceiving of the idea of a strike, Abdulaziz Abu Sunayd, one of its organizers, sent a note to Aramco executives questioning the company's segregationist policies. At the time, Abdulaziz was living in Washington, D.C., where he was teaching Americans to speak Arabic. But in the U.S., he was banned from entering movie theaters based on his skin color, and in his note, he questioned why the company was introducing similar practices in his own country. According to Vitalis, there was no documented response to Abdulaziz's note from Aramco.

Despite this initial questioning of racial inequities, however, through its long presence in the country Aramco was largely successful in imprinting an image of modern superiority in the minds of Saudis, the image that later was shipped to Riyadh through the appointment of Doxiadis.[11] According to Fadan (1983), "The oil company became the main carrier of new values and standards which have had a marked impact on the native population." And, as the physical manifestation of Aramco's Orientalist attitudes, the design and functioning of its camps established a long-lasting image of the superiority of American models of development. According to Fadan (1983),

> *Whether intentional or not, the mere coexistence of the two dramatically contrasting living environments of the Company employees' camps (the Senior Staff Camps and the Saudi Camp) had shaken the emotional equilibrium of the Company's native workers. . . . The amenities, and services provided the senior staff were not easily overlooked by the unprivileged group, triggering the workers' desire, sharpening their need for self-affirmation and opportunities.*

E. Spreading the Message

While the attitudes of modern Western superiority were transmitted indirectly through Aramco's segregationist policies and built environments, they were also spread directly through company media and homeownership programs, which led eventually to them reaching Riyadh and influencing both the appointment of Doxiadis and the outcomes of his planning efforts. Aramco-owned media was a prime carrier of the company's message, used to reinforce its ideals and embed them in the minds of Saudis. Perhaps most powerfully, television broadcasting did not exist in Saudi Arabia prior to Aramco's efforts, and the oil company's own channels were the first to introduce this new broadcast medium to the country (Fig. 2-11). But TV was not the only medium that Aramco used to create its image. The company also produced glossy magazines, lesser publications, and exhibitions that traveled across the country. With the exception of the exhibitions, these initiatives were typically produced both in English, directed toward their American employees, and in Arabic, targeting both the company's Saudi employees and the wider public. Indeed, the majority of the company's efforts were directed toward average Saudi citizens, who otherwise had no direct interaction with the company.

[11] Even the appointment of the Greek planner was heavily intertwined not only with the image that was created by Aramco, but also by the Greek's connections to American institutions and his positioning as a carrier of American values, as will be explained in following chapters.

Fig. 2-11: Left: Children's program filmed in Aramco studios. Right: Aramco TV covering a story in Dhahran. Source: Aramco.

Aramco's sustained media campaign served two purposes. First, as a means of exporting Western values, it aimed to deliver the Saudi population from the past and usher it into the future, in keeping with the company's view of itself as an agent of development and modern civilization. But, second, it created the illusion of the perfect society, reinforcing a sense of Aramco's superiority, and showcasing a particularly American view of what it meant to be modern in terms of facilities, houses, appliances, and lifestyles.

According to Fadan (1983), "In the company's publicity of its need for more native workers, television viewers saw a native worker who was about to receive his modern villa lavishly furnished with modern furniture. They would see the worker's children playing in the expensively equipped company playground, or would be given a look at the medical and cultural facilities available to workers." Clearly, such messages emphasized how vastly superior modern living conditions were compared to Saudi Arabia's own historical standards. But more importantly, they created a detailed illustration of an imagined (heavy on illusion) future based on the American suburb of the time. The developed West was no longer an abstract idea. It had a concrete and specific image, an image that the underdeveloped must aspire to attain.

Aramco's homeownership program was another extremely powerful tool the company used to spread this ideal as a way to "save" the indigenous Saudi population. Aramco had acquired access to vast areas of the Arabian Peninsula from the Saudi government, and it used it to create a program for helping individual Saudi workers attain this image of modern life. In fact, this new housing initiative was created only after conditions in the early workers camps deteriorated, and the government began to pressure the company to improve the situation for its native workforce. But the company also saw how such a program could improve its image significantly.

Any Saudi employee could qualify for the Aramco homeownership program. After filling out an application, the worker would receive a parcel of land, fully serviced with infrastructure, and the company would offer a loan that worker could use to build a home on it. Not only were

these loans interest free, but the company would forgive 20 percent of the loan value if it was paid off fully through deductions from company salaries. Seen in reverse, however, this meant that if an employee left the company before the loan was fully paid off, the cost of his house would automatically increase by 20 percent.

As in business ventures generally, of course, the motives behind the program were not completely based on altruism. As Jungers recounted to Hicke (1993), although it might have seemed like a giveaway, the cost of providing this benefit to its Saudi workforce was small compared to the profits the company was reaping in their country. Furthermore, "[The program] was economically a better deal for the company than taking care of people by building and renting housing to them. . .." As he explained, "[That] alternative had been tried in a number of areas other than Saudi Arabia, and it was a disaster, because you became the hated landlord and the system was inadequate."

The homeownership program also helped spread a certain message and reinforce deliberate ideals through design. To be approved for the program, supplied with land, and offered a loan, an applicant had to submit a building design that complied with Aramco's building codes. And these were, in large part, identical to the codes that existed in American suburbs, having been completely and faithfully copied and imported to Saudi Arabia from this context (Fig. 2-12). In an environment with almost no professional architects, the company further required that an applicant's drawings and plans be complex, professional documents. This meant that applicants had to rely on American architects working at Aramco to design their homes and supply them with construction documents. Indeed, it was reported that one of the busiest men in the Arabian Peninsula at the time was T. Coleman, a Californian contractor who worked for Aramco and who most Saudi employees sought to design and supervise the construction of their homes (Alshabib and Ridgway 2019).

Fig. 2-12: A villa built using the Aramco homeownership program. Source: Twitter.

To account for the surge in demand and the lack of professional capacity, American architects developed a number of typical design choices for applicants to the program to pick from.

These designs, of course, presented a Western, "international Mediterranean" image that differed starkly from existing local dwelling styles (Al-Hathloul and Anis-ur-Rahmaan 1985). Indeed, detached villas were almost completely unknown to Saudis prior to this program. Thus, Mashary Al-Naim (2008) has pointed out that the very nature of these new dwellings presented a drastic change for Saudis, such that they "suddenly found themselves in a completely different physical environment." Nevertheless, in few short decades, the new house design spread throughout the kingdom and became its most popular form.

Thus, in addition to creating a model new dwelling environment through its workers' camps, Aramco's media outlets and its homeownership program spread the image of modern living beyond its direct territory and area of influence (thereby increasing both) — an image that would eventually reach Riyadh. Aramco's role as an agent of social transformation worked both directly through the environments it created and indirectly by promoting a specific new lifestyle to which all Saudis could aspire. Its media campaign and its homeownership program, working in conjunction, by the late 1950s helped solidify a concrete image of what modern development meant in the minds of the Saudi population. "[Aramco's] very existence in the region evoked spontaneously a set of modernistic images symbolic of rising expectations," Fadan (1983) has asserted. Suddenly, the villa style and the suburban home became the idealized form of housing throughout the country.

F. Beyond Aramco's Boundaries

This chapter began with a discussion of the Orientalist attitudes that Aramco brought to the development of Saudi Arabia's oil resources in the pre-World War II years. The intent was to illustrate how Doxiadis's work was grounded in images that were deeply rooted in the Saudi consciousness, and that preceded his work in the kingdom. These Orientalist dynamics and systems first became manifest in the built environment of Aramco's residential camps, but the attitude of modernity and superiority they represented was later broadcast across the country through its media outlets and homeownership program. The result was that the Saudi government and population at large came to associate company attitudes with a modern physical image. The next logical stage in the trajectory, which would ultimately lead to Doxiadis's plan in Riyadh, was the actualization of this image in the Saudi built environment. This happened first at the Arabian Gulf port city of Al Khobar in Saudi Arabia's Eastern Province, and later in other cities, particularly in the Al Malaz district of Riyadh.

By the middle of the twentieth century, as a result of new oil wealth, Saudi Arabia had begun a rapid urbanization process that would eventually create a number of major new residential agglomerations. Established towns such as Riyadh and Jeddah were the first to lead the way forward, and became the initial winners of a "territorial competition" in the country — as this phenomenon was later labeled by Saskia Sassen (2012). But, by 1947, in an attempt to catch up with these existing towns, the governor of the Eastern Province, Prince Saud bin Abdullah bin Jalawi Al Saud, initiated a competing process of growth and modernization. As a consequence, Al-Hathloul (1981) has noted, "Al Khobar, whether consciously or not, led the way and set up a model which other Saudi Arabian cities were to follow in the 50's, 60's and 70's."

Before World War II, Al Khobar had been a small fishing village, which also happened to be the port where many of Aramco's expatriate employees first arrived in the country (Hicke 1993). It was historically a small town whose residential fabric had sprung up organically, flanking the port, on whatever land a resident could acquire and build on. Yet Al Khobar was also situated just outside the territory of Aramco, and it was as close geographically as it could possibly be to the American camp in Dammam. The vision that Governor al Saud aspired to was to a large extent modeled on this camp and to other American residential developments in the area, which he saw as being based on rationalized patterns of growth guided by a predetermined geometry (Fadan 1983). Toward that goal, he asked, who could better assist him and guide the process than Aramco itself? He thus commissioned the company to plan and construct a number of new residential areas for Saudis in Dammam and Al Khobar. And when Aramco came to the rescue, as legend now has it, its plan for Al Khobar became the first official master plan of any city in Saudi Arabia (Al-Hathloul 1981).

Naturally, Aramco employed a grid for its scheme. And the grid obviously has historical associations with the practice of colonial settlement. Expandable in every direction, grids may be easily laid out by surveyors with little understanding of local practices or environmental concerns. But local sensitivity is rarely an issue. The concern rather is for the swift and orderly occupation and development of land and the implantation of new structures of value and control. There have been many such instances of the use of grids in the structuring of urban settlement through time. Most famous, perhaps, is the 1811 plan for Manhattan. But there are many other examples in the U.S., including the 1847 plan for the new city of San Francisco. Grids have likewise been used in other areas of the world and at many times in human history, including by the imperial regimes of Greece, China, Rome, and Spain, to name a few. Although the use of grids is sometimes blamed for the unsatisfactory quality of contemporary master plans, some architectural historians, including Spiro Kostof, have argued this critique is unjustified. Kostof (1991) observed that, despite their association with urban decay, grids, as a module for development, provide a flexible and diverse system of planning that holds great potential, and that the quality of the result depends more on how they are employed. To illustrate this point, he explored examples in China and the U.S. to show how a grid may be used to guide development in very different ways depending on their design and application. This discussion will continue in later stages of this dissertation when it turns to Doxiadis's specific proposals for a gridded layout for the future development of Riyadh.

Circling back to Aramco, the grid was a common feature of suburban America and had been implemented in a number of forms across Aramco's camps (Alkhedheiri 1991). But in the proposal for Al Khobar, it was now applied to an area of about 160 acres (64 ha) that included the older sections of the city. In terms of form, it consisted of a series of blocks that averaged 40 by 60 m, separated by streets that were from 12 to 18 m wide (Fig. 2-13). The grid was aligned in a north–south direction and imposed a new settlement form that was abstract and brutal, and which took little account of the houses and other facilities already in place. Indeed, Al-Hathloul (1981), who has analyzed the plan a number of times, has contended that all development in place prior to Aramco's project "was treated as insignificant, and structures were demolished to open up the new streets and to preserve the grid pattern of the plan."

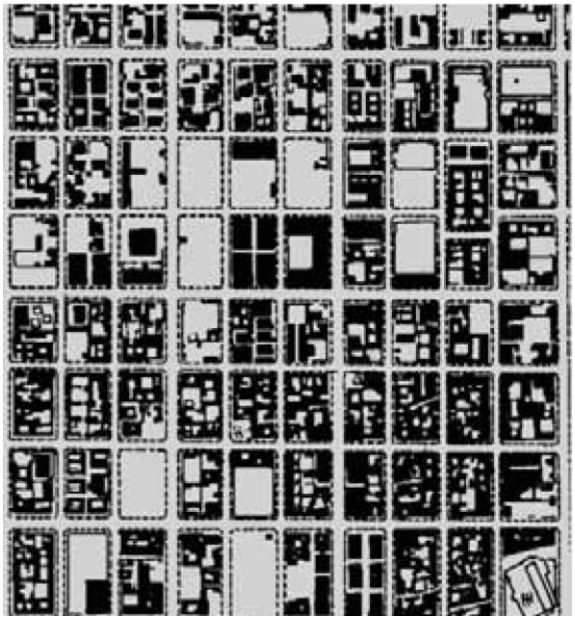

Fig. 2-13: Al Khobar plan and its grid by Aramco. Source: Al-Naim (2008).

Settlements in the kingdom prior to Al Khobar had largely followed an unplanned, organic form. They were thus developed from the bottom up, as the incremental agglomeration of buildings and developments constructed the image of the city. Al Khobar changed that, and as the first instance when the Aramco ideal of modernity spread beyond territory directly controlled by the company, it evinced a number of firsts in the kingdom. As mentioned, it was the first instance of a master plan, the first use of a grid to organize development, and the first "modern" style development intended for a general Saudi population. But there were other smaller firsts that were equally revealing. For example, it represented the first time that street-name signs were used, and it started a new convention of using numbers instead of more descriptive words to name streets and avenues. As Al-Hathloul (1981) also pointed out, as Aramco's grid was superimposed over older neighborhoods, wiping out the previous unaligned context, it also provided a first instance when the old was systematically demolished to make way for the "new." Under the influence of Orientalist structures, however, the Saudi public and government had been inspired by images of modern, orderly life in the Aramco camps. And they yearned to put these same principles into practice in the design of their own built environment. However, the Al Khobar plan was the first time they had followed through on the notion of organizing a settlement according to a predetermined (gridiron) layout.

Of course, the impact of the Al Khobar plan was powerful and immediate, and it did not take long for the image of modernity created by Aramco and reproduced in Al Khobar to be emulated elsewhere. Mashary al-Naim (2008) has pointed out that "the spatial concepts and house images that were introduced accelerated the impact of the new housing image on the local people, not only in these new developments, but also in surrounding old cities." Indeed, they soon came to shape much of national sentiment generally with regard to urban development. What started with Aramco's camps soon thus spread beyond the boundaries of the Eastern Province, becoming

the norm over time in other parts of the country, such as Jeddah and Riyadh, until eventually underpinning Doxiadis's plan.

The process by which this image spread took many forms. As discussed previously, Aramco's media and programs played a major role. But the enthusiastic descriptions of travelers and workers were also important; the latter, especially, were influential in spreading the image by word of mouth. Aramco needed a very large workforce, and this demand for labor could not be entirely met by recruiting residents of the Eastern Province. Consequently, Saudis migrated into the area from other areas of the kingdom, lured by the benefits Aramco offered. And although these workers typically migrated individually, leaving their families behind, they usually returned home on weekends and breaks. After a number of years working in the oil fields, many also moved back permanently to their hometowns, becoming heralds of Aramco's ideals, spreading the images and concepts of modern urban living to new provinces and cities.

However, perhaps the most seminal instance of the spread of Aramco's image of urban modernity, came through an act of official government policy: the construction of the new Riyadh neighborhood of Al Malaz. The development of Al Malaz had roots and foundations similar to those of Al Khobar, but its impact was national in scale because it represented the first formal use of a gridded master plan outside the Eastern Province.

Riyadh, as the capital of the country and its major economic and social hub, was expanding rapidly both in terms of population and territory by the 1950s. Prior to then, most government agencies had been located in Jeddah, but a decision by the late King Saud to name Riyadh the new governmental home after World War II meant that all agencies would need to move there. This led to a huge influx of government personnel from the west coast. The construction of Al Malaz in the early 1950s was seen as a way to provide a new home for them. Other new developments emerging in the city at the time were privately built, but Al Malaz was almost entirely financed and built by the Saudi government, making it perhaps the most significant housing project in the country.

Fig. 2-14: An aerial image of Al Malaz during its early construction. Source: Al Assaf twitter (@Mansoralassaf).

Initially named the Red Sea Neighborhood in a nod toward residents who had migrated there from Jeddah, the master plan for Al Malaz was the work of the Egyptian office of Saeed Kareem. It was built by the Arab Contractors Company, which might have planned it too if

common practices in the region had been followed. Initially, Al Malaz was planned as a satellite city, occupying an area of 500 ha, 5 km to the north of Riyadh's historical walls (Fig. 2-14). But, due to rapid urbanization, by the time the project was completed in 1953 it had been completely absorbed into the city's urban territory.

Al Malaz contained more than 1,100 dwelling units, varying from apartments for single workers to single-family homes for families, all organized in a grid pattern of rectangular blocks. Additionally, this new housing was supplemented by a number of supporting facilities, so that its population would not have to leave its boundaries. Its hierarchy of streets ranged from access streets that were 10 m wide, to 30-m-wide thoroughfares, to a single 60-m-wide boulevard that cut it in half. Its blocks and lots were spacious: the blocks were sized at 50 x 100 m, with a typical lot measuring 25 x 25 m. And among the neighborhood's other planned facilities was a horse-racing track, which initially provided space for a temporary airport until a more permanent facility could be opened nearby a couple of years later. Upon completion, Al Malaz also housed the original campus of King Saud University, the largest educational institution in the country, as well as several hotels, a stadium, and a zoo.

Because of its modern design and government backing, Al Malaz established a marker for later patterns of urbanization of Saudi Arabia. Most importantly, perhaps, it installed an image of development originally established by Aramco in the kingdom's new capital city, cementing it in the minds of all Saudis. Al-Hathloul (1981) observed that "comparing this newly introduced pattern with the traditional pattern of Al-Dirah, Riyadh's oldest neighborhood, one can see that new values in the conception of space have been introduced." As such Al Malaz represented an effort by the government to create an elite new neighborhood whose physical image would immediately be associated with modernity, advancement, and development.

The government workers who arrived from Jeddah to live in Al Malaz further contributed to its image. In general, they were perceived as more worldly than Riyadh's native population, and their cultured dispositions and higher incomes brought a new sophistication to the city — or so they believed at the time. No doubt they also appreciated the design intent evident in the planning and construction of the new city district. Thus, throughout the 1960s and 70s, through its most elegant phase, Al Malaz truly reflected the image that the rest of the city aspired to achieve. This cultural sophistication was illustrated in stories and anecdotes. For example, it is said that around 1965, at a time when most of Riyadh had not even heard of mochas and cappuccinos, you could actually order them from a coffee shop in Al Malaz (Al Assaf 2011). It is likewise rumored that Al Malaz was the first place in the city where one could buy a hamburger (Fig. 2-15).

Fig. 2-15: Left: the introduction of fast food to Riyadh in Al Malaz. Right: The old amid the new in the city. Source: Al Assaf twitter (@Mansoralassaf).

It is perhaps true that whatever physical environment these new elite and well-off residents lived in would have been considered modern and advanced. But it is important to emphasize just how different the fabric of Al Malaz was from the rest of the city, for not only did its layout deliberately diverge from the pattern of organic growth typical of cities in the region, but it relied heavily on the transplant of another Aramcoian physical attribute to Riyadh: the single-family detached villa. Prior to Al Malaz (with the occasional exception of foreigners relocated to the city), traditional courtyard homes built from local materials had been the major building block of the city. However, air-conditioned concrete villas became the main building form in Al Malaz. And similar to the prestige housing Aramco had introduced to the country through its American camps, these were initially imagined as being set back from the street behind a generous front yard (Fig. 2-16).

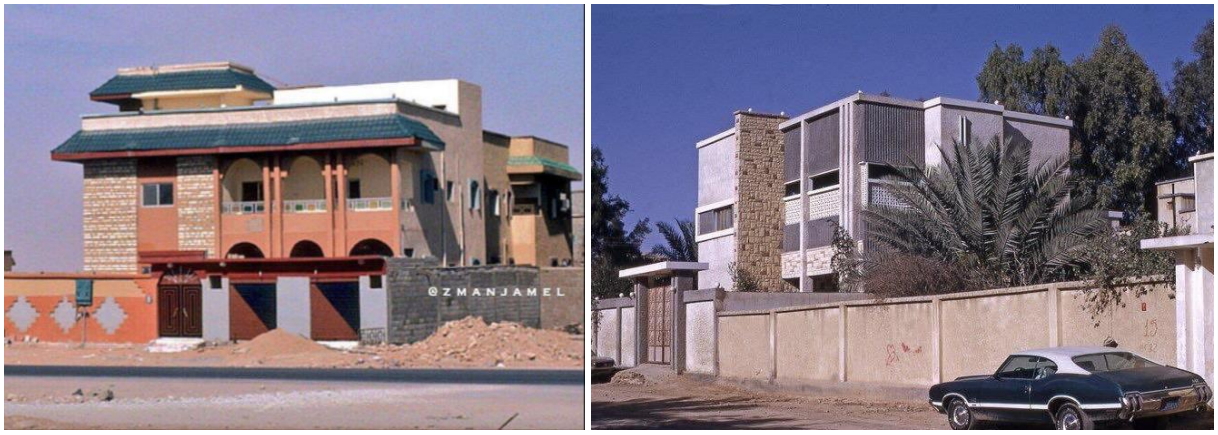

Fig. 2-16: Villas that emerged in Al Malaz. Source: Al-Naeem (1994).

After its introduction here, this typology promptly spread all over the city. Other physical characteristics of Aramco's image also became common in Riyadh in succeeding years. These included American suburban-style residential densities, the near complete erasure of semipublic space, and the introduction of private motor vehicles as the primary means of travel.

G. The Chosen Agent of (American) Modernity

When the construction boom initially started in Saudi Arabia with the birth of the country's oil economy in the 1950s, there were few planning structures to direct the growth of its cities. This reality became evident at different stages of their development. In the case of Riyadh, the first efforts to formulate a comprehensive plan to address its chaotic expansion did not start fully emerging until 1967. At first, it was the municipality that campaigned for such an effort. But when Riyadh's mayor sought approval for his city's efforts from the king, national agencies became involved, and the task of hiring a consultant to prepare a comprehensive master plan for the city was transferred to the Ministry of Interior Affairs, particularly to its Town Planning Office (TPO). In the time between the king's approval of an official commission for the project and the transfer of authority over it to the TPO, the municipality made a list of six highly acclaimed international planning firms from which to invite proposals. The list included names such as Kenzo Tange and I.M. Pei. However, when the authority to contract for the work was given to the TPO, the list was extended to include six additional firms. Among possible reasons for the expansion was the TPO's desire to claim ownership of the project, but it is also possible that it reflected the influence of the American-trained Omar Azzam, a powerful voice at the TPO, who was serving at the time as a personal consultant to King Faisal bin Abdulaziz. Regardless of the reason, the new list included other multinational firms, including DA, which eventually won the commission.[12]

It is important to understand the position that DA and its founder, the Greek modernist planner Doxiadis, held in the world of planning at this time and how this dovetailed with images of modern development that existed in Saudi Arabia as a result of its long association with Aramco. This link not only explains the presence of Doxiadis in the country but also points to the impact of the earlier discussion about the role of Aramco on the 1972 Riyadh plan. As the 1950s and 60s wore on, it became increasingly evident that urban planning could provide a significant tool to advance the ideological positions underlying the Cold War confrontation between capitalism and communism. There were a number of reasons why Doxiadis's proposal for Riyadh was selected over its competitors (and the specifics of Doxiadis's approach will be covered in the next chapter). But in the realm of urbanism as a battleground in the larger Cold War competition for influence in the developing world, and particularly the Middle East, DA was a top ambassador for American values. Thus, just as the Saudi image of modernity had been drawn through Aramco from American models, so too did the Saudi government choose America's favorite global planner — to deliver that American-inspired image of modernity and development.

The importance of DA to efforts to export American values at the time can be clearly seen, for example, in an article by Drew Pearson for the *Washington Post* in 1963. Published in the year

[12] Names that later comprised the expanded list included figures such as the CIAM member Georges Candilis and John Harris, a British architect responsible for the first master plan for Dubai.

following the Cuban Missile Crisis, the article focused on American planning and its strained relation with more shortsighted forces of market-driven urbanism. In particular, it reflected a growing awareness of the field's increasingly important position within larger geopolitical conflicts of the times. According to the article, the period was characterized by the explosion of urban populations in emerging areas of the world. At a time of mounting tensions between communism and capitalism, there was thus a need to promote a vision of urban development that reflected American and Western values.

In some respects, the *Washington Post* article was little more than a propaganda piece for Doxiadis. Titled "The World's No.1 City Planner," it described the work of DA in detail and applauded its efforts. Indeed, much of the first paragraph read like an advertisement for the firm's services: "On a hill opposite the Acropolis in this ancient Greek city is the office of an architect who is probably the No.1 city planner of the world." It then listed Doxiadis's many accomplishments and achievements, quoted his lectures, and described his projects in the Middle East as important to the fight against communism (Pearson 1963).

Invoking different examples from New York to Houston, Pearson then argued that short-term political tradeoffs were overshadowing the long-term goals of American efforts to solve the problems of cities. "To many congressmen, planning is a dirty word," he wrote. However, "if there is one thing that could defeat our political system, it is the failure to plan." Communist cities, on the other hand, had much more advanced notions of planning. "We may not like their plans, but they are looking far ahead of us." The article concluded by asserting that "one of the best ways to help Khrushchev fulfill his threat to bury us [America] is to continue putting log-rolling politics ahead of long-range planning" (Pearson 1963).

THE ROVING EYE

Doxiadis: Greek God Of All The Planners

By GRADY CLAY, Real Estate Editor

HIGH ON A LEDGE cut into Mount Lycabettus in Athens, Greece, sits an eight-story office building containing one of the most significant planning offices in the world.

The firm of Doxiadis Associates is not only deeply involved in replanning the downtown Louisville, Ky., waterfront, but also in replanning the economies of whole regions and nations around the world.

By now the largest planning-consulting firm in the world, it has some 700 employes, about half in Athens, the rest scattered across some two dozen countries in Europe, Africa, Asia, the Middle East, and North and South America.

Head of the firm is Constantinos A. Doxiadis, 52, an erect, gray-haired man of commanding presence and keen mind. He organized the firm in 1951; by 1955 it had 100 employes, and today turns down the majority of jobs offered.

The Doxiadis Associates office, together with the Athens Center of Ekistics and Athens Technical Institute—both organized by Doxiadis and housed in adjacent buildings—have become a port-of-call for heads of state, ministers, and a host of visiting architects, planners, engineers et al from all over the world. His office guest book reads like a Who's Who in International Development.

Has Many Interests

Having magnetized one segment of the development world, Doxiadis has also attracted ideas and capital. He has recently organized a tourist agency, formed another company to operate five tourist yachts, has set up Doxiadis Associates Computer Center, plus a new experimental building firm, and is also starting plans to build for a tourist town, New Mykonos on a famed Aegean island.

In May, he received a $1 million grant from the Ford Foundation for the Athens Center of Ekistrics to expand its research programs. One of them has been running since 1960 devoted to one subject, "The City of the Future."

All this well-organized activity represents a significant new venture—an international planning-consulting business with its roots in a dozen professions. What many have advocated—a "marraige" of many professions to better cope with the vast urban problems of the world—Doxiadis has been doing.

Located between Asia and Europe, at the seat of the world-respected ancient culture of Greece, the Doxiadis office has gathered an impressive list of clients from the developing nations. They seem to be looking for the unsuual combination of services which Doxiadis includes under the term of "ekistics."

This is a Greek work with meanings that include both "house" and "settling

Continued On Page 6

Staff Photo

Constantinos A. Doxiadis is a man of many interests over the world. An airplane for quick transportation and a camera for recording views of various cities are among tools of his trade.

Fig. 2-17: A common view of Doxiadis in American media. Source: *Louisville Courier-Journal* (Clay 1965).

In fact, DA had few projects in the United States (the most prominent was a plan for Detroit in 1965[13]). None of them were extremely successful, and most were never formally adopted. But the relationship between Doxiadis and the U.S. foreign policy establishment was extremely important. Indeed, his firm was considered a critical tool of American efforts to combat communism globally and encourage the spread of American-directed market capitalism. According to Michelle Provoost (2007), where Soviet-bloc Socialist Realist planning relied on a top-down approach, employing such familiar elements as "the vista, the axe, the square, the closed housing block, [and] monumental palazzo-inspired architecture," Doxiadis work offered a hopeful new view, in which "state imposed collectivism . . . was replaced by an emphasis on bottom up communities. Moreover, the ideas of change and growth without boundaries and technology solving every possible problem, from demographic growth to energy shortage to pollution to economic backwardness to ethnic and social unrest, all of this made Doxiadis vision the perfect vehicle of the USA-development ideology."

Interestingly, however, it was Doxiadis's ability to stand both within and without the political projects of the U.S. that made him such an important figure. By advocating for science and the impartial gathering of data, the approach taken by his firm could be hailed as a nonpolitical exercise, moving it away not only from personal artistic impulses but from the overtly political motives of previous planners. Arguing that "action may be wise if it is based on the knowledge and understanding of facts, on science," the firm's projects were rather promoted as the technical outcome of cold algorithms and unbiased analysis, without political agendas or aspirations (Doxiadis 1968). This stance was extremely appealing at the time, especially in the Middle East, where Western interventions were viewed with political distrust and anxiety. Doxiadis's Greek nationality also allowed him to be enthusiastically welcomed in the region, and it freed him from the imperialist package that had often accompanied and hindered European and American efforts there.

Yet while Doxiadis's claims of neutrality generated major benefits for his firm and helped him attract numerous high-profile commissions, his projects were not without political underpinnings. To the contrary, the firm's work in developing countries was political in more than one sense. Much like many modernist plans, it was commonly an instrument to advance certain local political aspirations and agendas over others.[14] It also served to encourage modernization and the integration of the region's developing economies into the larger structures of Western corporate capitalism. Many scholars have viewed the work of DA through such a lens, as an agent of pro-Western development. Indeed, Doxiadis was perceived as the perfect agent to achieve America's goals. He combined a firm belief in its ideals with a stance of scientific neutrality, Greek nationality, a charming, marketable personality, and a high level of professional efficiency.

The roots of Doxiadis's own personal orientation toward the West can be traced to many years prior the foundation of the firm. For instance, Bromley (2005) and Deane (1965) have described how this pro-Western attitude owed much to his early years of activism in Greece

[13] The study was commissioned by The Detroit Edison Company. It was a five-year engagement to study the city and the region and propose a new master plan. In addition to DA, Wayne State University also participated in the study.

[14] This aspect of modernist plans is often discussed. Holston (1989) thus argued that modernist projects typically align with political regimes as a mechanism for total planning. Le Corbusier's work in relation to political regime has been heavily discussed, and recent publications have argued that his architecture and plans cannot be isolated from his right-leaning politics. For more on the topic, see de Jarcy (2015), Perelman (2015), and Chaslin (2015).

working underground against the Nazi army. At that time, he formed an underground taskforce that became widely admired in intelligence circles and worked closely with Americans on daily basis. But the immediate postwar years were critical for Doxiadis, since they cemented his alliance with the Americans as a believer in their calls for freedom and capitalism (Theodosis 2016). After the war he expanded his connections to American institutions when he traveled to the U.N. Charter convention in San Francisco. An exhibition he had worked on as a Greek government official was presented at that conference, and Doxiadis, himself, chaired the Greek delegation there. This engagement ultimately led to Doxiadis's involvement with other multinational Western organizations, leading to his active engagements in many future events, including appearances on Voice of America radio broadcasts (Fig. 2-18).[15]

Fig. 2-18: Doxiadis speaks to the Voice of America. Source: Architectuul.com.

Doxiadis also became tied to the U.S. as Greece's administrator for the Truman administration's Marshall Plan aid program.[16] President Harry S. Truman himself advocated an aid package of $400 million for Greece and Turkey in a speech to a joint session of the U.S. Congress. And Doxiadis viewed this commitment with high regard as a tool to fight the spread of communism in Europe. He saw it as especially critical in reviving the Greek economy, which had been severely damaged by the war. In an interview with an American journalist, he later expressed his gratitude

[15] Voice of America was a government-funded, state-owned multimedia institution founded in 1942 to advance the interests of the American government. It mainly targeted international audiences and broadcast in more than 40 languages. During the Cold War, it was an important American instrument in spreading American ideals against communist propaganda. In an article published in 2013, the journal *Foreign Policy* labeled it "the U.S. government's mammoth broadcasting arm."

[16] Officially named The European Recovery Program, the Marshall Plan was intended to aid Western European countries, allocating $12 billion to help revive their economies after the devastation of World War II. As such, it is credited with helping to curb the spread of communism in Europe. For more, see Steil (2021).

and admiration for this commitment. As he said, "had it not been for the Truman doctrine I do not believe that Greece would have been what it is today. And of all the acts which have been known in relation to Greece for the last many tens of years in the last few generations, the Truman doctrine is the one which had the greatest importance for our nation" (Brooks 1964).

The perception that his approach to planning advanced a Western (and particularly American) agenda yielded many symbiotic professional benefits for Doxiadis and his firm, and Doxiadis understood the importance of those links to legitimize his efforts, to increase his appeal, and to simply connect him with opportunities. For instance, it meant that Americans and other multinational capitalist agencies would mobilize their connections and networks to facilitate his work. For example, from the founding of his company until his death in 1975, numerous DA commissions in the Middle East were acquired through and supported by different institutions with American links. In Iraq, for instance, he was recommended to the government by the International Bank for Reconstruction and Development, where Doxiadis had contacts through the Ford Foundation. His connections to Harvard University were crucial in securing the commission for planning Islamabad, where he initially arrived as a part of formal delegation otherwise largely comprised of Harvard professors. And in Lebanon, he worked on the national housing program, a commission that was handed to him directly by the United States Operations Mission, after the U.S. military concluded its three-month incursion into the country in 1958 to support a Lebanese government threatened by communist-backed civil unrest. His connections to the World Bank, Ford Foundation, and the International Monetary Fund, among other agencies, played a part in introducing him to different contexts and gained him access to different projects. (Theodosis 2016; Middleton 2009; Ménoret 2014; AlFaisal, Fahad 1977; S. Al-Hathloul 2018)

The backing of the United States also mobilized a powerful media machine that helped build his reputation and market his firm. In 1963, Doxiadis was thus named the third recipient of the Aspen award. Labeled the American Nobel, it is presented annually to the person "anywhere in the world judged to have made the greatest contribution of the advancement of the humanities." At the ceremony to present the award, Doxiadis was introduced as a person who "has redesigned the environment of more than 10 million people and thereby lifted man's hopes, aspirations, and spirits" (Sutherland 1966). In addition, he was often featured in the front pages of American magazines and newspapers, his projects were closely followed, he did many interviews, and he was given a platform to write, lecture, and express his ideas extensively. A popular face in America, he became "one of the only urban planners ever to have enjoyed such a remarkable celebrity status" (Bromley 2005).

In 1970 the *New York Times* listed him as one of the most important 100 people in the world. In placing his name among world leaders and other prominent figures, the paper explained that "he directs one of the world's largest and most far-flung planning offices, probably the best-known member of a profession growing increasingly busy as the urban crises worsens." However, they were careful to point out that "Doxiadis concern is revamping whole continents and shaping cities everywhere except in the communist countries" (*New York Times* 1970). More recently, Ménoret (2014) noted that one reason for the obsession with his work within American media was their recognition of the role urban planning and Doxiadis's particular projects played in spreading American ideals in the developing world.

On one hand, the American media machine and their political connections created an image of Doxiadis as the exceptional planner. But on the other hand, in practice, there was little in terms of professional success to support that position (Ménoret 2014). Doxiadis's theoretical

contributions were undeniable, and his contributions to the practice of the urban planning profession were significant. But professionally, Islamabad was a rare success story in 1960. Most other projects did not reach the same level of implementation, and indeed, some were never formally adopted by the client governments or agencies that paid for them. However, this seemed less relevant after he became a face for an American approach to town planning. This American association was no doubt beneficial for the project in Riyadh, and in some ways, it may have been more important than his professional experience or the success of his projects elsewhere.

Indeed, as archival materials reveal, part of his appeal as the chosen agent of Saudi urban modernization was precisely because of his U.S. links. For instance, on January 29, 1969, when the project was at its very early stages, the deputy minister of the interior, Abdullah Alsudairy, described it in a televised interview. His hope was to introduce the project to the Saudi public for the first time and familiarize them with its scope. Introducing DA, Alsudairy stated, "We have hired the famous Greek town planner Doxiadis for the master plan of Riyadh. Maybe you know him, he is working in the U.S., also in Washington, D.C., and Detroit" (Bislanis 1969). What is also important to point out here is that when Alsudairy described the task and scope of the project, it became clear that the image that Saudis held of development was closely associated with American suburbs. Thus, the deputy minister did not mention Doxiadis's many other famed projects and designs. Rather, what he found inspiring about Doxiadis — and what he considered to be most alluring about him (as a way to promote the project and its potential benefits) — was Doxiadis's past association with the United States, even though his work there may have been far less impressive than his designs for Islamabad or Baghdad, for instance. What Saudis wanted at the time was an image associated with the American way of living, and Doxiadis, as a figure associated with that image, was the person able to deliver it.

H. From the American Suburb to Riyadh

At the time of its selection, DA was regarded as one of the top urban planning firms in the world, and Doxiadis's own association with American ideals of town planning and the connections he had to institutions of American foreign policy clearly also played a role in the firm's selection. Yet a vision of what the Saudis imagined the blueprint for their new capital city to be was already established in their minds. Simply, they aspired to be what they were not seen as being in the 1930s — what they saw represented in the privileged preserve for Westerners in the Aramco camps. They saw American town planning in Aramco and wanted it. As cemented in the layout and planning of Al Malaz, this was the image they aspired to achieve, and Doxiadis was the agent who could ensure it. Thus, Aramco had established what should be considered modern, what "development" should look like, and the Saudis hired Doxiadis from a long list of global architects and planners because they thought he would be the most likely to provide that for them in a master plan for their fast-growing capital.

Some sense of how these notions would play out can be seen in an anecdote from early in the process. Prior to the arrival of DA, there was already a project ongoing by an Italian company to improve some of the streets in the city. And early on in his engagement with the city, Doxiadis made the decision not to hinder it, but to make sure of close coordination with the new plan in terms of alignments (Doxiadis Associates 1968a). However, early in 1969, representatives of DA

in the country were called to the mayor's office, and upon their arrival they were welcomed to a meeting room with the mayor and his team on one side and the Italian company on the other. There followed a heated discussion between the Saudis and the Italians, after which the DA representatives were asked to present their view on the issue at hand to decide between the two viewpoints.

The issue at hand concerned the widening of certain streets: the mayor wanted to demolish some buildings to create a wider boulevard, while the Italian consultants urged him to remain within the existing street parameters since the buildings were privately owned. In his appeal to the Doxiadis team, the mayor asked, "In your works in America and the West have you seen main important boulevards at the heart of the city this narrow?" He then answered his own question: "It is impossible!" (Doxiadis Associates 1968b). Clearly his standard for correctness in the city's design was based on notions of what existed in the West (and in America particularly), what that developed world would do, and how the future of Riyadh could be derived from the same principles.

Eventually, many aspects of the 1972 Riyadh master plan would produce a form of development that mirrored the image of American suburbs that Aramco had first introduced to the kingdom. For example, it took an extremely regular form, shaped by clear lines, following the inspiration of Aramco's camps; it promoted the use of single-family villas; and its wide streets, low densities, and plot sizes were all designed to promote the new housing typology. Other aspects of Doxiadis's plan that were deeply rooted in American precedents included an imagined style of living in protected enclaves, an extreme dependency on automobiles, and its largely dismissive treatment of the old city. Perhaps most importantly, as a reflection of Saudi Arabia's aspirations to modernize, the application of a hierarchical grid structure was particularly coveted. First imported to the Saudi context as a way to provide a familiar environment for Aramco's American expatriate workforce, it was as a key modern characteristic that the Saudis favored and adored, and which had been a foundational element of the planning of Al Khobar and Al Malaz. "It is from Aramco that the grid gained its reputation as the new modern model of developments," Al-Hathloul (1981), wrote. "It subsequently became a sign of class and status in the social hierarchy."

In America, the grid was a common feature of towns and cities, providing an easy way to commodify land for sale. It had thus been employed from the early nineteenth century as an instrument of capitalist expansion — for example, in New York City where it was used to parcelize lands for sale in the eighteenth-century city. Numerous cities on the western frontier likewise used it to provide an image of established settlement before the reality of settlement actually existed (Reps 2021). Even more significantly, the underlying settlement DNA for huge areas of the United States outside the original thirteen colonies was established by the Jeffersonian land surveys of the late eighteenth and early nineteenth centuries. Those surveys eventually imposed a uniform pattern of mile and quarter-mile sections that now provides a ubiquitous armature for the sprawling development of such cities as Los Angeles, Las Vegas, and Dallas. In some ways it is the preeminent feature of the American suburban landscape. And although Doxiadis may have arrived at its use as a structuring element from a perspective based on entirely different principles, the fact that it was a common feature of DA's other plans (and in some ways stood out as a trademark of the Doxiadis approach) aligned perfectly with the preexisting Saudi Dream of a modern future.

More than a decade separated the completion of the Al Malaz district from Doxiadis's arrival in the city, but it is still possible to trace the trajectory of ideas, concepts, and imaginaries (including the original Orientalist notions that guided the development of Aramco's camps starting

in the 1930s) through Al Malaz to major elements of his plan. However, there was a complex indirect influence between Doxiadis and the existing fabric of Al Malaz. When Doxiadis first received the commission to design the Riyadh plan, Al Malaz was at the heart of the city, physically located in the middle of its anticipated territory. Its realization had also established an image for what the development of the larger city could aspire to on a grand scale. Nevertheless, the district also lay in the way of a more comprehensive effort to structure the city in a unified manner on a scale several orders of magnitude larger. One approach, therefore, would have been to erase the neighborhood, to demolish and rebuild it to align with a comprehensive new vision — or at least heavily modify it. Alternatively, the decision could have been made to nurse it, to center it in the new vision for the city, incorporating it in future development and reimagining the new city around it as a holistic entity. Interestingly, the DA plan charted a middle course between these extremes. In effect, it largely overlooked Al Malaz, doing the absolute minimum to connect it to the new city. Thus, in formal terms, it devised the new plan for the city as if Al Malaz did not exist.

Although its interventions in the neighborhood were minimal, the ideas the plan carried and the notions it advanced for the future of the city nevertheless had a substantial impact on the trajectory of Al Malaz's development. Thus, in the years that followed, many changes to the physical character of the district became evident that could be traced indirectly to the influence of the 1972 master plan. For instance, in the early years after it was planned, villas in Al Malaz were constructed in the middle of their lots with open front yards. Much as in suburban areas of the United States or in the camps of Aramco, there was little in the way of a formal barrier between public and private spaces (Al-Hathloul 2018). A few properties did have short fences to demarcate the boundary between spaces, but the most common typology was for the home to have direct access and visibility from the street. This typology was completely transformed by the late 1970s. By then, almost all villas in Al Malaz were surrounded by fences that were about 2 m high and formed a clear boundary. Those high fences were designed to shield homes from public view, to ensure the privacy and safety of residents, and to clearly demarcate private from public space. The fences were a concept that Doxiadis introduced in his plan and championed in his designs. After they appeared in newer areas of the city built to the specifications of his plan, they were also incorporated into Al Malaz.

When DA was hired (and indeed all through the planning process), the Saudis had a clear image of what they wanted, and Doxiadis was commissioned to deliver that image for them. Yet as the case of Al Malaz indicates, the 1972 plan was also a product of negotiations between Doxiadis and the Saudis, and it contained many contradictions. On the one hand, Doxiadis believed strongly in certain social and political ideas that he wanted to see reflected in the plan. The same was true in terms of his thinking about how a city should function as an organism (more on this in the coming chapters). On the other hand, the Saudis imagined certain physical traits to be emblematic of a modern, developed city (some with hidden agendas), and they tasked Doxiadis with bringing these to life. Many of these notions aligned with Doxiadis's visions and ideas; however, in few instances there were contradictions between the two views that had to be resolved. Thus, the plan was the product of two established points of view. On the one hand, it reflected Doxiadis ideals and ideas in substance, but it also displayed characteristics shaped by the powerful vision that the Saudis held — the Saudi Dream.

I. Conclusion

Aramco had arrived in Saudi Arabia with the main purpose of oil exploration, but after its arrival, it began producing an image of development that eventually became a core element in the country's city-building trajectory. The image that Aramco established was one of superiority and modernism, as opposed to Saudi backwardness, and this image was associated with a specific physical environment. That environment was transferred from suburban America, and through a certain relationship and dynamics it became an image of what Saudis aspired to attain. The image and relationship derived from the Orientalist attitude and framework for development that Aramco brought to its early work in the country. Its earliest physical manifestations were in camps that the company built to house its expatriate and local staff. The environment these created and the social dynamics that unfolded inside them were the physical expressions of that image, and thus the concepts and ideals now had specific characteristics and traits to give them form. Those images and ideals, and their physical features, were further spread and enforced through two primary initiatives: Aramco's use of media and publicity, and its homeownership program. The two initiatives were powerful and played a crucial role in spreading that image to Saudis who did not have direct contact with Aramco.

As a result of Aramco's programs in the country, and in a few short years, a certain image of modernity became a clear and powerful driver of Saudi aspirations for a better life. It provided the population at large with a concrete notion of what modern development meant, what form a developed city and domestic dwelling should take, and what lifestyle the population at large could expect to achieve with such a new level of development. Thus, through the following decades, that concept transformed from being an image that Saudis observed at Aramco and through its media to one they sought to construct for themselves. The first attempt to do so took place in Al Khobar. As the first planned city in Saudi Arabia, Al Khobar was a monumental project; naturally, given its position in the country at the time, Aramco was tasked with creating a master plan for it and overseeing its development. However, the mandate that Aramco came to be regarded as having been granted (both the choice to allow the company into the country in the first place and acceptance of the product it delivered) was also a result of the image Aramco spent years carefully crafting. And with this powerful ideological wind at its back, the mandate quickly spread beyond the Eastern Province. By the 1950s, it reached Riyadh, where its most visible manifestation was Al Malaz neighborhood. This new neighborhood, built to house government officials who moved to the city from Jeddah, followed many of the same physical qualities that Aramco had planned into its early camps for expatriates. Through its regular grid, modern housing typologies, and contemporary building materials, it was an attempt to recreate that environment in Riyadh.

Thus, when Doxiadis arrived in the country in the late 1960s, the stage had already been set by the early influence of Aramco. That lineage of imagery and ideals was separated by many years from the work of Doxiadis, but its form was similar to what he had arrived at along a different social trajectory. He arrived at a time when a precedent of modern urban form had already been made concrete, and his appointment and the details of his assignment were deliberate efforts by his Saudi employers to build on those early foundations. Doxiadis's image and appeal thus fit perfectly with the image that Saudis — officials and residents — held of what "urban development" should be and what they aspired to attain in their capital city. Moreover, they commissioned a professional whose reputation was to deliver the American dream. And Doxiadis himself perfectly understood those notions and the appeal he held within the context.

As this chapter has tried to show, the notions of superiority and modernity that were first introduced to the country by Aramco initially spread beyond the boundaries of the company's own

developments through the plan for Al Khobar in the Eastern Province. They then spread to Riyadh through the design and construction of the new Al Malaz district. Contrary to popular conceptions, a particular image of modernity was not only influential in the process of planning the city and in the final product DA delivered in 1972, but it was already present in the country at the start of the master plan project. And so were the underlying Orientalist ideas that had led to the establishment of this particular dream of modernity in the minds of Saudis, and which had a significant impact on the plan from before it was commissioned to after its final adoption.

Chapter 3: The Man, Doxiadis

> *How can we go beyond the idea and the conception into reality and creation, I ask myself? I often sit back and think. Life is very long.*
>
> *I say to myself; I have to decide to be a philosopher at night and a builder every morning.*
>
> — Constantinos Doxiadis[17]

A. Introduction

As the last chapter sought to illustrate, there were a number of reasons originating both within Saudi Arabia and in relation to the geopolitical context of the time that predisposed the Saudi government to choose DA to produce the first comprehensive plan for Riyadh. Not only did those conditions lead to the choice of the Greek planner, but they also had a significant impact on the end product that he was to deliver in 1972. However, the firm's appeal also derived from the ability of Doxiadis to convince prospective clients that his firm would apply the latest and most advanced "scientific" approach to planning projects. This emphasis on a rational, systems-oriented approach was in part a result of secular developments within the design professions at the time. Since World War II, the utopian visions of early modernists for the total remaking of urban conditions according to heroic new forms that would wipe away the trappings of the past had largely failed to stem the rising sense of urban crisis across the world, indicating that they were obsolete ideas and concepts. In part this reflected a reconsideration of the harsh, functional quality of early modernist designs. But it also derived from an urban population explosion, especially in developing countries experiencing an unprecedented surge in rural-to-urban migration. And in more affluent contexts it reflected the impact of new levels of mobility that had blown open the container of the nineteenth- and early twentieth-century city, creating belts of sprawling suburban development.

Since at least the early 1960s, urban planning and design had thus begun to move away from specific formal imaginaries, such as those that had led to Brasília and Chandigarh, and toward technocratic approaches that emphasized more open-ended processes of growth management. The change was, in turn, facilitated by advances in information-gathering and computing, as well as a new emphasis on social science research as a way to understand population dynamics. On the one hand, the work of DA was at the forefront of these trends. On the other hand, in his writing and attitude toward the profession, Doxiadis himself equally sought to celebrate the role of the expert in predicting the future and devising universal solutions to global problems. Several writers have thus referred to Doxiadis as the last modernist visionary, pointing to his attempts to reinvigorate the authority of universalist design discourse in the period before the advent of more situated

[17] During the week of March 7, 1966, as a lecturer-in-residence at Trinity College in Hartford, Connecticut, Doxiadis gave three public lectures on his work and theories. The college documented and subsequently published the lectures in a book titled *Between Dystopia and Utopia*. The quotes at the start of the sections of this chapter are all excerpts from those lectures unless otherwise stated.

postmodernist approaches. As discussed in the last chapter, the DA approach also appealed to the capitalist West because, in a Cold War setting, it created a frame for market-driven development that emphasized personal freedom, democratic governance, and private property rights over central government control.

In line with the larger argument of this thesis that the 1972 Riyadh plan was not the result of a linear, one-sided approach but of negotiations between different forces and players, this chapter will examine the ideological and professional context in which it was produced. In the preceding chapter, I grounded Doxiadis's work in the context of what was occurring in Saudi Arabia, arguing that these local forces had a significant impact on what he produced. In this chapter, I will extend this discussion to consider what was occurring in professional and intellectual discourses of the time, which I argue were also influential in determining both the plan's overall conception and many of its specifics. The chapter will first describe how Doxiadis's theory and practice sought to build on the legacy of international modernism while seeking to correct what he considered its inadequacies. Specifically, he aimed to revive the theoretical force and posture that previously had been developed within modernism and that characterized the work of firms associated with the CIAM. Although Doxiadis had never been a member of this organization himself, he admired the climate of intellectual engagement it had fostered and the preeminent role it had established for the "expert" theorist and planner.

Doxiadis practiced planning mainly at a moment in history when cities in different parts of the world were facing enormous challenges. These included the task of rebuilding following the destruction as a result of World War II. But at the same time, many countries in the decolonizing world were also facing the need to house huge influxes of new residents in their formerly limited traditional urban centers. Meanwhile, in the U.S. and other developed regions, additional problems surrounded the abandonment of urban cores by the wealthy and the middle class and the subsequent creation of segregated pockets of urban poverty. Practitioners were experimenting with a number of approaches to these issues, including the development of regional plans based on massive programs of highway construction, the building of satellite cities and peri-urban high-rise housing estates, and land-use planning that separated activities such as shopping, living, and working into separate functional zones. Many of these strategies were built on the conviction that centralized urban development could no longer meet the requirements of modern life. Doxiadis, however, remained firmly committed to the value of urban concentration and city living. He thus criticized attempts to disperse populations, because he believed such patterns deprived their residents of the benefits of city life, while at the same time acknowledging the shortcomings and failures of existing city patterns. Ultimately, his solution was to propose an entirely new framework for building, a new "science" of human settlements, which he called ekistics.

Unlike the modernists who came before him, who emphasized new, rational forms of development, Doxiadis was also a firm believer in the structure of the traditional neighborhood. And since his work in the postwar reconstruction of Greece, he had also advocated for the importance of local programs of housing construction as a way to rehabilitate cities and promote the development of new economies. Yet, within his preferred model of low-rise, often owner-provided housing, a key problem was how to address the physical and political challenges posed by the automobile. Thus, much of the theory of ekistics dealt with establishing a new approach to urban form and order that would allow new levels of mobility to coexist with the human need for a walkable neighborhood structure. Ultimately, these came together in his proposal for a

"Dynapolis," the realization of which he had already attempted in the master plans for other cities in the developing world, including Baghdad and Islamabad.

Thus, in this chapter, I will investigate Doxiadis's theoretical contributions to urban planning and his design ideals, in addition to contextualizing his work within larger urban planning trends that were apparent in that time. The goal is to illustrate that Doxiadis's plan in Riyadh was not produced in a theoretical vacuum, and it was not solely a pragmatic response to what Doxiadis found in Riyadh. On the contrary, the plan was heavily linked to discussion within the field of urban planning and design at the time, and to ideals and concepts Doxiadis had developed in relation to it and that he carried with him to Riyadh. This chapter thus continues the work of the previous chapter but through a different lens. Specifically, it aims to further ground the description and analysis in Chapters 4 and 5 to follow, through a discussion of conditions that transcended the boundaries of Saudi Arabia and the specific task of establishing a blueprint for growth of Riyadh.

B. Modernism 2.0

On July 12, 1963, the *New Hellas*, a historic ship of 2,500 tons, docked at the Greek island of Delos. On board was a group of highly distinguished designers, thinkers, scientists, writers, and theorists who proceeded to the island's ancient theater to sign a bold urban planning manifesto/declaration. The group included 34 figures from fourteen different disciplines whose shared concern was the future of human settlements. All of them were at the top of their fields, and some had notable international reputations, such as the architect and systems theorist Buckminster Fuller, the transportation planner Colin Buchanan, the architect and town planner Richard Llewellyn-Davies, and the housing expert Charles Abrams.

Signing the declaration was the last act of a weeklong event, the Delos Symposium, held aboard ship in the Aegean Sea, during which attendees had reflected on the status of modern cities and discussed solutions to the perceived urban crises of the time. Doxiadis, or "Dinos" as his friends typically called him, had been solely responsible for setting up the event. Every detail of its agenda had been carefully orchestrated in advance to achieve a specific purpose. And by inviting attendees to Greece, he believed they might consider both the glory of its historical sites and the problems facing present-day Athens and other large cities in the region. But beyond this, the event allowed him to expand on the principles of ekistics, a self-defined science of human settlements he had spent the last fifteen years developing (Fig. 3-1).

Fig. 3-1: Left: Doxiadis presents ideas at the Delos Symposium in 1963. Right: Doxiadis and Buckminster Fuller at the Delos Symposium. Source: Constantinos A. Doxiadis Archives.

However, when the symposium began, the very first discussion, held in the cruise ship's bar, illustrated the doubts in the minds of those attending as to the scope and premise of Doxiadis's claims. "Who said there is a crisis?" asked one attendee. "I question that conditions are getting worse," yelled another. Nevertheless, and as a testament to Doxiadis's salesmanship, the group became more convinced as the week progressed of Doxiadis's interpretation of contemporary conditions. Indeed, the discussions in the last few days moved from questioning the existence of the problem to discussing ways to solve it, and the declaration signed by the group at the end became a warning cry against a universal urban crisis (Fig. 3-2).

Fig. 3-2: Final deliberations before signing the Delos declaration at the end of the 1963 symposium. Source: Constantinos A. Doxiadis Archives.

As the declaration stated, the contemporary urban crisis was mainly being caused by a lack of planning, a condition that undermined civic order, created conditions of chaos, and led to the destruction of historic traditions. "Failure to adapt human settlements to the dynamic changes of

our times may soon outstrip even disease and starvation as the gravest risk short of war, facing the human species," the group declared. The document then went on to predict that the next forty years would see the complete transformation of human settlements. As the world's population rose to beyond 7 billion by the early twenty-first century, cities would see more construction than in the previous 6,000 years of recorded history. In response to this dire prediction, the participants agreed to create a permanent secretariat to advocate for organized, comprehensive solutions to the prospect of global urban disorder. They also promised to repeat their meeting in a year's time to discuss their future work (Deane 1965).[18]

The symposium was significant in many respects. It not only illustrated Doxiadis's brilliance as a salesman (as attested to by Wolf Von Eckardt, one of the attendees), but it displayed many of his convictions and ideals in regard to cities. It also signaled his desire to revive the intellectual structure developed in the 1920s and 30s by the Congrès Internationaux d'Architecture Moderne (CIAM). Before its dissolution in 1959 following attacks on the radical functionalism of its founding members, CIAM had defined itself as the vanguard of a new, rational architecture and urbanism, free from emotional attachment, and it had held numerous meetings similar to the Delos Symposium. Indeed, Doxiadis had borrowed the idea of a floating meeting from one of its founders, the Swiss architect Le Corbusier, who had been instrumental in organizing a similar event on the cruise ship *Patris II* traveling from Marseilles to Athens and back from July 29 to August 14, 1933. That 1933 meeting had developed the basis for CIAM's most famous document, a manifesto officially published in revised form as The Athens Charter by Le Corbusier in 1943. By holding the weeklong meeting on the *New Hellas*, Doxiadis was clearly expressing a desire to revive this professional and intellectual legacy, positioning himself as a successor to Le Corbusier.

Under Doxiadis's direction, the Delos Symposium would continue as an annual event for another fourteen years until his death in 1975, and its similarities to the older CIAM meetings would continue. Both, for example, included only prominent figures (CIAM had initially been composed of 28 leading figures in the fields of architecture and urbanism), who attended by invitation only. And attendees at both sets of meetings explored issues of cities in workshop settings held for a specific short period of time, leading to radical manifestos calling for immediate action. Another sign of the CIAM legacy was the participation of several former CIAM members, including its secretary general, Siegfried Giedion, and an influential committee member, Jaqueline Tyrwhitt (Bromley 2005).

The connection to Tyrwhitt, a British-trained South African planner, was especially important, since in 1955, as a new faculty member at the Harvard Graduate School of Design, she had helped found the journal *Ekistics* with Doxiadis. Later, as its editor, she had become one of Doxiadis's closest collaborators and encouraged the widespread distribution of his and others' writings on ekistics so as to create a planetary community of leaders devoted to the technical challenge of new forms of human settlement (Seng 2021, p.57).[19] Tyrwhitt further made the connection to the work of the Scottish urbanist Patrick Geddes, which was in turn rooted in the work of the geographer, naturalist, and explorer Alexander von Humboldt and his notions of a "Kosmos." Instead of describing the natural world as a static taxonomy, Humboldt had sought to

[18] The Delos Symposium's next meeting took place in July 1964, and the group ended up conducting a total of twelve such meetings on a yearly basis. The description of the events of the first symposium are taken mostly from American media coverage of the event. For more, see Deane (1965).

popularize a method of dynamic description, the new field of biogeography, an approach that Geddes sought to apply to cities and regions.

As an early advocate for a scientific approach to urban planning, Geddes is sometimes referred to today as "the father of modern town planning," and many of Doxiadis's attitudes toward cities ultimately derived from precedents he established. For Geddes, extensive surveys needed to be made before any master plan could be created — "diagnosis before treatment," as he often claimed. His reasoning was that good urban plans needed to be significantly shaped by context, and this could only be appreciated through holistic assessment of a range of geographic, climatic, economic, and social conditions. Critical of the heavy dependency on artistic designs and ideas that were often abstract and generic, Geddes also believed a sound plan should be built from the bottom up, so that it could take into account the complex set of interactions that defined people's relationship to their environment. During his life, Geddes's most famous work took place in the city of Edinburgh, which became a model for other projects. He viewed the city as a series of overlapping frameworks, a structure that was multilayered and that could change to meet its inhabitants' evolving needs (Geddes 1915).

As much as they sought to imitate the former CIAM meetings — for example, through their high-profile invitees (including former CIAM members such as Giedion and Tyrwhitt) — the Delos Symposia also differed from the earlier CIAM congresses in important respects. CIAM's members had almost exclusively been architects and planners, and their deliberations on the form of cities had taken place in a highly structured setting. By contrast, the original Delos Symposium and the ones that followed were more casual and relaxed. Doxiadis typically had little in terms of a planned agenda, and participants were required to prepare little material in advance. Instead, he wanted the events to be open, in the belief that allowing them to flow freely created the best condition for the generation of out-of-the-box ideas by great minds. Participants in the Delos Symposia were also a more diverse group, coming from a variety of backgrounds. Thus, in addition to those already mentioned, the first Delos Symposium included the media theorist Marshall McLuhan, the anthropologist Margaret Mead, and the economist Barbara Ward Jackson. The diverse composition of the group was reflected in the declaration that followed. Far more general in scope than The Athens Charter, it extended to incorporate ideas on media and network systems (Seng 2021, p.58). Echoing the concerns of a younger generation of architects with the social aspects of built form that had led to the Team Ten schism within CIAM in the mid-1950s, the Delos Symposia also sought to consider the needs of human settlement in its entirety. And in this respect, the meetings also embraced the new ecological perspective that had been developing throughout the 1960s. Finally, while CIAM was (initially, at least) composed of outsiders rebelling against the status quo, the group attending Delos in many respects embodied the status quo. According to Deane (1965), "They were not young dreamers removed from the power structure of their homelands, but men in key government posts whose daily task is to revamp the world."

Such similarities and contradictions mirrored the complex relationship between Doxiadis and the Modern Movement in design in general. Mainly working in a post-CIAM world, Doxiadis was nevertheless fascinated by CIAM's theoretical contributions and believed firmly in early modernist convictions regarding the universal applicability of design solutions. And yet he also understood the many limitations of functionalist approaches and had witnessed firsthand the failures of modernist projects during his early career as an official in the Greek government. In particular, the formalist views of the CIAM old guard had failed to anticipate the rapid expansion of the postwar city. Faced with forces such as the explosion of urban populations, the impact of

the spread of technologies (particularly the automobile), and the growth of global social and economic networks, he believed that a more flexible approach was needed, one that addressed the problem of the city at an entirely new scale.

In comparison to other modernists, Doxiadis also made a point of emphasizing the relationship between theory and practice. He thus understood how CIAM-inspired urban projects could be criticized for being abstract, theoretical, and detached from reality. When asked about Doxiadis, one of his close collaborators described his approach as follows: “Dinos is unique because he has a perfectly wild imagination, perfectly disciplined by common sense” (Deane 1965). By the late 1950s, many CIAM pioneers were being labelled as isolated idealists, and their model cities were being criticized as unattainable dream worlds. Doxiadis perceived how such opinions could lead to hostile views of many CIAM planners, and he criticized older modernists for advocating ideas that were impossible to realize.

This awareness was especially clear in his discussions of Le Corbusier. Doxiadis admired the French architect and planner, and didn’t hide this fascination with his revolutionary genius. He thus asserted that Le Corbusier was “the only man I know of who tried to face many of the problems of the ideal city, down to many details, including houses and their interiors.” On the other hand, he pointed out that Le Corbusier’s urban plans, like those of other CIAM founders, were unrealistic in scope and unworkable in application (Fig. 3-3). “Their effect was also negative,” he wrote. “[When] followers tried to build these cities, . . . [the] plans could not lead to a realistic implementation” (Doxiadis 1966).

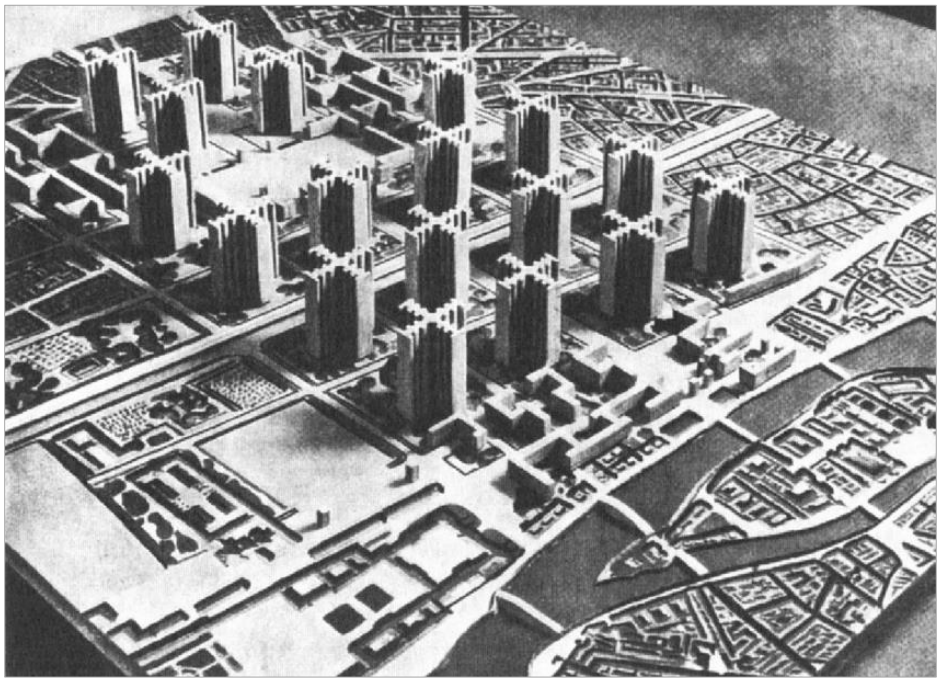

Fig. 3-3: A modernist dream: Le Corbusier’s “Plan Voisin” for the reconstruction of central Paris.

Aiming to guide modern design toward a more productive engagement with society, Doxiadis sought to reimagine the relationship between theory and practice. He thus sought to use

his design practice to engage with the actual condition of cities and so formulate and continually revise his theories of human settlement and urban development. In this sense Doxiadis was exceptional — one of a few planners working at the time who could maintain a two-way relationship between theory and built work. His theoretical output included more than twenty books, hundreds of articles, countless talks and lectures, and the founding and continuous production of two journals — *Ekistics* and *DA Review*.[20] Yet he also developed a serious, ongoing professional practice. By the mid-1960s, DA had become a multinational enterprise headquartered in Athens in a modern complex of buildings with a view of the Parthenon. Its work included projects in more than forty countries, and by the late 1960s the firm claimed to be responsible for plans to house more than 10 million people (Bromley 2005). Doxiadis himself was described at the time by the *Washington Post* as the world's busiest planner (Laurent 1965).

In his attempt to revive the authority of modernist discourse, Doxiadis thus aspired to balance many contradictions — to level art with science, theory with practice, modern technology with the qualities of traditional urban life. The ideal city of the future was a place "which satisfies the dreamer and is accepted by the scientist, the place where the projections of the artist and the builder meet" (Doxiadis 1966). Thus, while Doxiadis criticized the "dreams" of older modernists, he did not believe the activity of dreaming itself was misguided. Indeed, both activities were essential. His goal was to take a step beyond modernist utopias, to develop them so they could be realized in practice. He called this product "entopia" because it implied a utopian vision continually realized in practice. "There is only one road left, with reason and dream, which should take us out of the bad place into a good place," he wrote in 1966.

Doxiadis also believed that much of what passed as modernism in the 1950s and 60s actually represented a retreat from the core principles of modernism itself. The dreadful condition of cities by the mid-1960s was thus a result both of a lack of pragmatism and theoretical conviction. Specifically, he argued that an infatuation with formalist schemes had led modernist planners to abandon their commitment to science and rationalism. A true scientific approach to the problems of the city required the feedback provided by the analysis of data generated in the field. Doxiadis thus conceived of rational, modern planning as a continuous process, a never-ending self-correcting activity. The solutions proposed for a particular planning project might be influenced by theoretical conviction, but an evaluation of its outcomes was also needed to produce an improved version of the theory. This would then provide a guide for subsequent projects, and so on. For this reason, Doxiadis considered his theories by nature to be unfinished. Ekistics, Doxiadis's main system of planning principles, was a prime example. Doxiadis himself pointed out that it took 26 years for ekistics to develop to a form that was publishable (Doxiadis 1968).[21] It had continued to evolve from its initial conception in the 1940s, through its implementation in a variety of projects, to the assessment of its implementation in all of them, including the plan for Riyadh.

As Doxiadis and his colleagues stepped off the *New Hellas* in 1963, it is therefore perhaps best to understand his goal in staging the first Delos Symposium as being to reinvent modernism — to create something new on the ruins of the old. In contemporary terms, one might conceive of

[20] Citing this extraordinary output and the founding of ekistics as a new discipline, Bromley (2005) labeled him an "intellectual entrepreneur."

[21] In his book on ekistics, Doxiadis (1968) wrote, "twenty-six years have gone by since I started working lecturing and writing in a systematic way towards a comprehensive approach to the problem of cities and villages. That is, since I began developing ekistics as the science of human settlement."

this as seeking to establish Modernism 2.0. This notion played a powerful part in his plan for Riyadh, and understanding its proper grounding will help us later unpack the layers of Doxiadis's work there. Viewing himself as a regenerator, Doxiadis remained faithful to the rationalist, universalist ideal of modernism, while seeking to repackage it in a way that would allow it to develop beyond its past limitations. Faced with the failure of functionalist, formalist modernism to provide answers to the real challenges of mid-twentieth-century cities, a new approach was needed. Most importantly, the scale and rapidly increasing size of the cities meant they could no longer be viewed as static entities; their growth could now only be channelled. And yet Doxiadis also believed in the power of expert designers to address this problem. New universal models could be devised that would be more flexible and that might reestablish a sense of order while allowing cities to grow ever larger and provide a proper habitat for all humanity.

C. Comparable Planning Systems

Before turning to specific aspects of Doxiadis's background and training that led him to develop his particular approach to the problem of post-war urbanism, it is important to consider how his views fit with those of his contemporaries and immediate predecessors. There are two general areas to consider in his regard: general theories of urban planning and design as they existed at the time, and previous projects in the Gulf that addressed the introduction of modern systems of planning to previously traditional, locally determined settlements.

During the depths of the Depression in the 1930s, forecasts inferred that many Western countries might see population declines. But by the late 1940s, the baby boom was in full swing, and projections of population increases were being continuously revised upward. By 1956, the United Nations was predicting a global population explosion that, together with a decline in rural economies, would create a worldwide urban crisis. In the developing world, the problem of slums and shantytowns became a paramount concern, and by 1960, the U.N. was calling for new spatial policies to address the development of cities and their peripheries as part of larger urban regions. Its later Reports also stressed the responsibility of governments to provide new housing options that would stabilize physical, economic, and social conditions for the masses of new urban residents (Middleton 2009). The amount of housing it estimated would be required to alleviate these conditions numbered in the tens of millions of units.

At the same time, it was becoming evident that ongoing programs of government-funded housing employing modern models were not only inadequate to stem the demand but were also failing to provide for the development of healthy social life. Often poorly maintained, such new environments, in which people of various backgrounds were thrown together without a sense of community or common heritage, were seen as breeding grounds for social pathologies. At the same time, there was ample evidence in the U.S. and elsewhere that the triumph of automobile culture was rapidly destroying the form of older cities, as wealthier populations made use of the extra mobility automobiles afforded to flee the central city for the suburbs. Within such a context, a range of issues would need to be addressed. Among them were overcrowding, inequality, disorder, pollution, mobility, and outmoded forms of housing. In the face of such conditions, many visions emerged. In answer to the same root question — "The city of tomorrow, what should be its form?" — urban theorists arrived at a variety of different answers.

For the purposes of this discussion and to understand the relation of these different urban visions to Doxiadis's ideas, I have divided trends in thinking about the future of cities at the time into four distinct groups based on the values they reflected and the forms they set out to produce. Before discussing these and providing examples, however, I should note that my categorization has little to do with the chronological order in which they were developed or the geographic locations for which they were proposed. Of the four groups, the first focused on efficient urban function and conceived of urban form primarily as a way to promote and enhance it; the second prioritized nature and conceived of urban form as a way to promote a healthy connection between nature and society; the third focused on urban aesthetics and argued that appearance should be the main consideration of urban morphology; and the fourth defined human connections and networks as the main purpose of a city and considered form primarily as an enabler of such links and structures.

For the first group, a great city was one that functioned efficiently and fluidly, so that its form should be designed to achieve peak efficiency. Other considerations such as social, economic, and aesthetic values were thus seen as secondary in the quest for effectiveness in design. The views of most of the major contributors to this view shared similar characteristics: the city needed to have a strict separation of land uses, division according to classes of structure, and a clear and extensive circulation network to serve the isolated parts. Kevin Lynch (1981, p.85) has described cities conceived in this way as being "made up of small, autonomous, undifferentiated parts, linked up into a great machine."

The most dominant figure within this group was Le Corbusier. A firm believer in technological rationalism, his design approach was grounded in the modernist quest for objective standards and scientific fact. Le Corbusier imagined a bright new future brought on by rapid technological advancement and the emergence of the automobile. If these forces could be properly developed through central government control, they could help establish a new society of order and harmony. Le Corbusier also did not attribute any significance to the context in which the cities of the future would be developed. Indeed, both of his main proposals, the Plan Voisin and the Ville Radieuse, were conceived as tabula rasa projects (Fig. 3-4). Both imagined a stark separation of land uses and functions connected through an elaborate transportation network. The form that resulted championed strict order and organization, expressed in "pure" forms and a symmetrical grid. The prominent urban theorist Lewis Mumford was not kind to Le Corbusier, suggesting that his city of the future was, in substance, simply a city of the past packaged in modern glass (Mumford, 1961, 1986). According to Mumford, Le Corbusier's city relied on a political power structure of Napoleonic dreams; was big for the sake of being big; and worshiped order and geometric structure as if it were a new religion (Fishman 1977).

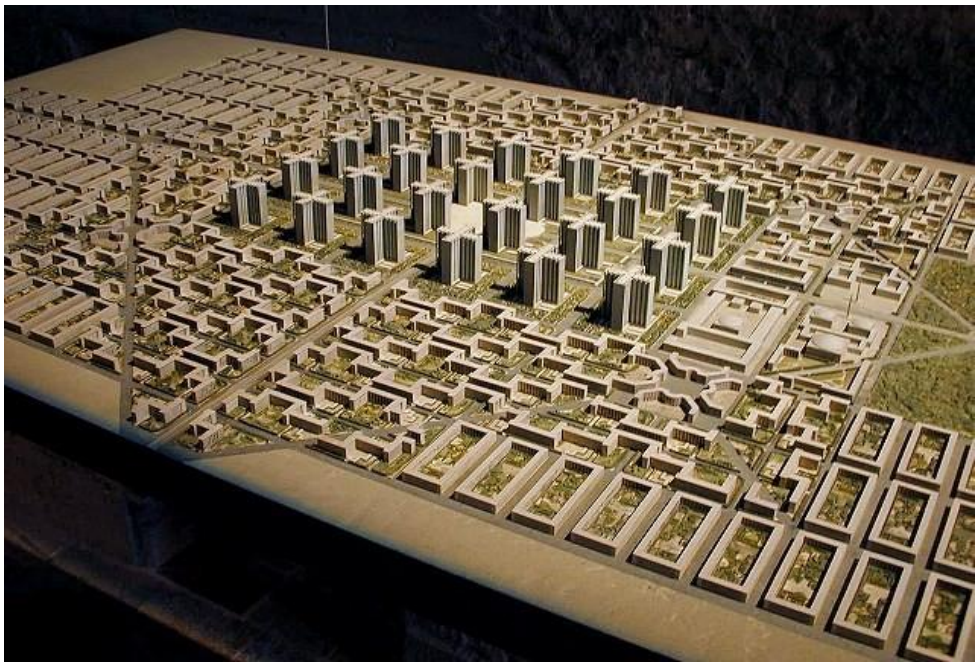

Fig. 3-4: Le Corbusier's Ville Radieuse. Source: Archidaily.

Before Le Corbusier's time, however, other influential urban projects had been able to blend a desire for functional efficiency with an appreciation of context. Indeed, one would struggle to find a project with more impact than that of Baron Georges-Eugène Haussmann for mid-nineteenth-century Paris (Fig. 3-5). Hausmann's vision was significant for its ambitions, technical sophistication and complexity, scope and scale, and for its far-reaching impact on future projects around the world. He redesigned Paris through a complete top-down process that included, among other things, the creation of entirely new outlying planned areas and the opening up of old areas using a modern network of boulevards. His project likewise included the rebuilding of properties along these new boulevards to modern standards, the allocation of land for new parks and other public spaces, and the creation of a new system of municipal administration.

Fig. 3-5: Haussmann's plans for Paris. Source: Falski (2013).

Haussmann's Paris was one of aesthetic grandeur, in which wide boulevards, lined with new buildings of a uniform architecture, connected monumental focal points. But its main motive was functional. Louis Napoleon (Napoleon III), who ruled France from 1848–1870, had entrusted Haussmann with the task of building a new Paris that discouraged the potential for political uprising. Thus elements of the new order and symmetry had other purposes. For instance, the trees that lined Haussmann's boulevards "seemed to humanize the boulevards . . . [yet] it was they, above all, together with the great width of the boulevards themselves, that made barricade-building difficult" (Broadbent 1990, p.117). It was perhaps for this reason that Haussmann's work was extremely controversial. He was criticized at the time for his top-down approach, his promotion of unequal patterns of wealth, and even for his claim to have been the author of the project (many attributed it to Louis Napoleon and considered Haussmann simply as its executor). Leonardo Benevolo (1985) has additionally pointed out that while it functioned well for some time, "finally it proved inadequate to the growing needs of the metropolis; it was then that his impressive plan revealed its absolute lack of flexibility and its extraordinary resistance to any change."

Despite its authoritarian underpinnings, Haussmann's approach influenced the design and planning of many cities around the world, not only in Europe but far beyond. For example, it was popularized in the United States through the City Beautiful Movement, whose golden moment lasted from the 1890s to the 1920s. As in Haussmann's redesign of Paris, order and aesthetic value were important to the City Beautiful Movement as a source of civic pride and well-being. But these were ultimately seen as secondary to functional efficiency. The intent was to overcome the ills of the past, and as in Paris, City Beautiful plans were often characterized by boulevards cutting

through the fabric of the city to connect major monuments or important buildings. In an age before freeways, these were seen as critical to establishing direct and efficient transportation corridors.

The movement gained its popularity in 1893, when Daniel Burnham and Frederick Law Olmsted designed the World's Columbian Exposition in Chicago using the "European style." A number of other important projects followed — most notably, Burnham's plan for Chicago (Fig. 3-6). The Chicago plan proposed a series of large avenues radiating out from the center of the city to a massive peripheral thoroughfare. It proposed bi-level boulevards for traffic and shopping, an efficient system of highways, a magnificent lakefront, and an extended network of parks and green spaces. Besides Chicago, the movement's (and Burnham's) influence continued to be evident through work in other U.S. cities, including Washington, D.C., Cleveland, and San Francisco.

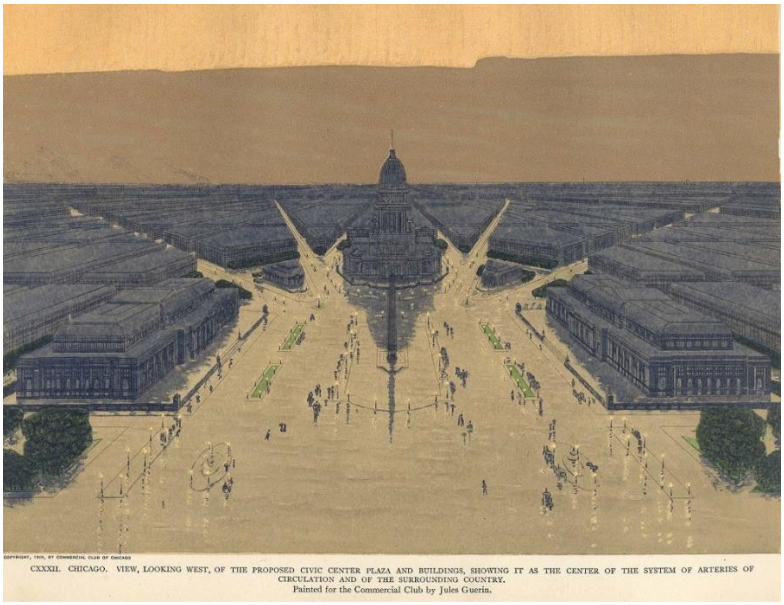
CXXXII. CHICAGO. VIEW, LOOKING WEST, OF THE PROPOSED CIVIC CENTER PLAZA AND BUILDINGS, SHOWING IT AS THE CENTER OF THE SYSTEM OF ARTERIES OF CIRCULATION AND OF THE SURROUNDING COUNTRY.
Painted for the Commercial Club by Jules Guerin.

Fig. 3-6: Burnham's plan for Chicago. Source: Painted for the Commercial Club by Jules Guerin.

The second group of urban designers influential during Doxiadis's lifetime sought to create a form of urbanism aligned with the healing powers of nature. While the function-based group opposed the current form of cities, they were not opposed to the idea of the city. Advocates of the nature-based approach, however, conceived of the very idea of the city as developed during the industrial age as responsible for the dreadful condition of contemporary life. In their view, the only way to create more humane environments was to thin cities out, to disperse their populations over a larger territory, and to return to living in smaller agglomerations in harmony with nature. Yet, aside from the nostalgic quality of this vision, which imagined that all good cities throughout history had been ones that afforded their residents the chance to live in harmony with nature, advocates for this view embraced a functional approach. Thus their plans and proposals were characterized by strict order and clear systems. As the result of very different motives and intentions, however, their proposals were completely different in scale than those of the urban theorists in the first category; they instead saw it as a means to structure the built world to live in harmony with nature.

Ebenezer Howard developed as the key figure in this thread of thinking about the relation between urbanism and nature. As expressed in his 1902 book *Garden Cities of To-Morrow*, Howard's understanding was that cities were a powerful magnet that drew people in search of better living conditions. The only alternative magnet that existed at the time was the countryside, which was not as powerful. The solution to this phenomenon was, in his opinion, to create a third magnet that combined the benefits of the two existing ones while avoiding the ills associated with each. He imagined this third magnet in the form of the "Garden City," a new community built in isolation from the current city and its degrading qualities (Fig. 3-7). Howard argued that human society and the beauty of nature should not be separated, but were meant to be enjoyed simultaneously. His vision of this new community was that it would grow to reach a population of some 30,000 residents and be surrounded by a greenbelt, so that its residents would always have access to nature, sun, and fresh air. It is interesting that, while Howard's advocacy for Garden Cities had a major impact on urban design, it was not built on specific proposals for built form. A careful examination of Howard's book reveals that most of it is dedicated to economic models, political systems, and social structures, while the physical environment is only vaguely described, in a short, ten-page chapter.

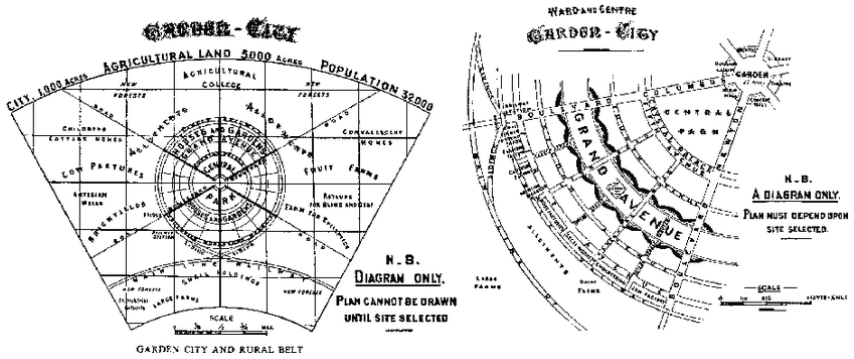

Fig. 3-7: Concepts of Howard's Garden City. Source: Howard (1965 [1902]).

The planning work of Frank Lloyd Wright could be categorized as falling both within the function-based and nature-based approaches.[22] Unlike cities of the time, Wright proposed that Broadacre City, the name he chose for his ideal city, would be a based on decentralization (Fig. 3-8). It encompassed thousands of homesteads spreading over an expansive countryside, creating private territories where people could live in harmony with nature. In this model, the home was the main unit of society, with the family at its core, while places of work such as factories and offices would move to the background as supporting units. The vast scattering of the population would be enabled by automobile; and even more than in the previously geographically proximate city, it would be through their widespread use that society's parts would interact, connect, and become part of a whole. Undoubtedly, Wright believed in individualism, but, to him, organic order was even more important. Every living thing thus had a place and shape of its own that could

[22] Indeed, it would be safe to argue that almost all utopias, whether Robert Owen's ideal cooperative social community, Charles Fourier's complexly graded communal society, or many others, fall within the same grey area between the two groups.

contribute to the harmony of the whole. In hindsight, Wright clearly understood the dangers of extreme urbanism, yet his views have nevertheless been faulted for failing to acknowledge the benefits of large cities and the power of access and proximity (Fishman 1977).

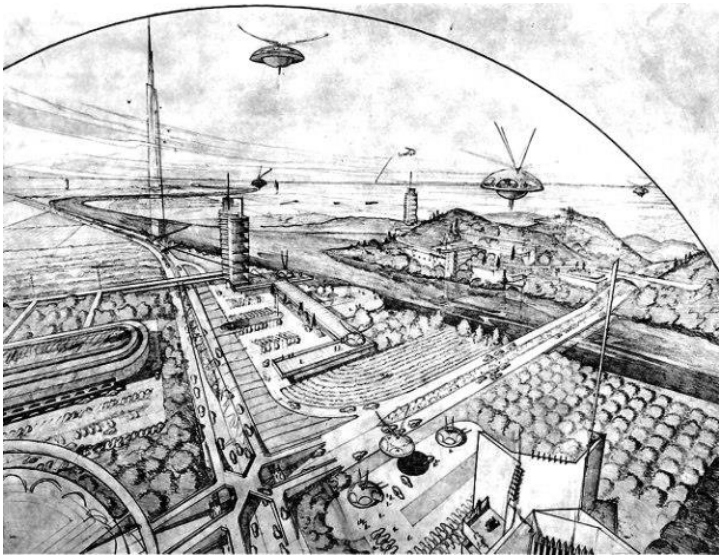

Fig. 3-8: Wright's Broadacre City. Source: FLW Foundation.

A third trend in urbanism influential during Doxiadis's life can be defined by its primary concern for aesthetics. To those who advocated this view, the main reason for the deteriorating quality of the twentieth-century city was a lack of concern for appearance and formal physical character. Camillo Sitte's 1889 book *City Planning According to Artistic Principles* (not translated into English until 1945) was an early, key influence on this approach. Sitte argued that, while modern planning and design had advanced in technical expertise and efficiency, it had made little progress in terms of aesthetics, which he called the "artistic" side. And the book was conceived specifically as an argument against the Haussmannesque approach, with its top-down focus on order and efficiency (Broadbent 1990). Sitte instead asserted that the rebuilding of urban areas should be conceived on a smaller scale, using calculated, tactical strategies rather than grandiose, large-scale ones. Sitte also favored irregularity over imposed order, pointing out that it was the experience of idiosyncratic physical forms that endowed cities with character, identity, and charm. Beyond this, however, what was exceptional in Sitte's work was his recognition that irregularity did not imply chaos, and that there could be an inherent logic in even the most irregular urban forms.

Robert Venturi, Denise Scott Brown, and Steven Izenour rediscovered this approach several generations later in another major work, *Learning from Las Vegas* (1972). Like Sitte, they sought to introduce unorthodox contentions into ongoing debates about aesthetic value. They also offered key arguments for form-based approaches lying between the top-down modernist approaches and bottom-up community-based design. For decades, modernists had been calling for pure forms, clean lines, and minimum ornament. *Learning from Las Vegas* sought to challenge the importance of purity by arguing that it was the expressive quality of urban form that made it interesting and sustained people's attention.

Such a renewed emphasis on locally derived form included the popular trend labeled "townscape," with Gordon Cullen as its leading figure (1971). Cullen's ideas came from a similar place as *Learning from Las Vegas*, in that they were intended as a response to the austere modernist forms that had dominated postwar rebuilding efforts. And another influential author in this school was Roger Trancik, whose view of the city was similar to Cullen's but who came at the topic from a different perspective. For Trancik (1986), the large-scale design of building complexes had created one of the most emblematic problems of contemporary cities. This was "lost space," which he defined as leftover space that is unstructured, undesirable, and in urgent need of repair. In general, urban theorists in the third group focused on the aesthetics and the physical form of cities for their own sake. But Cullen and Trancik differed from the rest because they looked beyond the single building or development to focus on aesthetics of relationships and connections.

The fourth school of thought regarding urban form during Doxiadis's career consisted of theorists and practitioners who placed human considerations at the center of the city-building process. Urban form, they believed, should be considered and constructed in a way that mainly served human emotions, needs, and relationships. In their view, the problem with other approaches was that, in a quest to achieve other considerations, they alienated people from their own cities and surroundings. Two different subcategories of thought emerged within the larger frame of human-based approaches to urban built form. One focused on the direct relation between form and people, and sought to understand and promote qualities of place in the physical environment. The other considered the impact of urban form on the development of healthy human–human relations, so that form's main role could properly be conceived of as enabling and enhancing those relations.

The work of Kevin Lynch is a natural starting point in understanding the ways that place-based urbanists sought to evaluate the relation of individuals to the urban environment. In *The Image of the City* (1960), he proposed that the physical characteristics of a city are different when experienced through day-to-day life than when considered through processes of plan-based form generation. His imageability theory thus focused on the ways urban form resonates with individuals — how citizens read their own cities and understand them. Although his work was in some ways similar to that of the form-based group, Lynch's explorations of the physical form of the city were focused more on how people read that form, what meaning it held for them, and how it affected them. And in subsequent work — namely, his powerful book *Good City Form* (1981) — Lynch took this human-form relation a step further to discuss the link between physical form and human values. The simple questions he aimed to answer were: "What makes a good city?" and "Why do people perceive one city to be a good one and another city to be a bad one?" He proposed that the answers to these questions were anything but simple. Indeed, he made it clear that they differed based on personal and contextual circumstances, which makes finding generalizable formulas and strategies almost impossible.

The journalist and social critic Jane Jacobs was perhaps the most dominant figure in the second subcategory. Her seminal work, *The Death and Life of Great American Cities* (1958), focused on urban form as a critical medium and facilitator of human–human relations. Jacobs was a major critic of top-down urban renewal approaches; in her view, a city should be constructed from the bottom up and over time, and the main driver of urban form should be that it allowed vital human connections and networks to prosper. Her straightforward method involved exploring parts of cities that worked in an effort to discover the larger principles behind them, and she argued that what made cities work was not form itself, but the way that form could serve as a facilitator for human–human connections. To her, great cities and neighborhoods were made through those

connections and the diverse activities the uses they encouraged. Much like Jacobs, the architect Christopher Alexander focused on those interactions. In his article "The City is Not a Tree" (1967), he argued that relationships and networks between people were the main element in designing a successful city. Alexander built his position from studying old cities, and he supported it by using mathematical equations.

Positioning Doxiadis within the four groups is a difficult task. On the surface, his work fit most closely with the ideas developed by the first group, but it contained areas of commonality with all four groups. To the Greek, efficiency was of most importance; thus the accommodation of the city to the automobile was essential. However, he diverged with this view most notably in his belief that a city was a living organism that must be allowed to keep expanding and growing. The role of the planner was thus less to specify particular forms than to create a mechanism to accommodate and direct urban growth. Like Le Corbusier, Doxiadis's work was also driven by a modernist quest for objective standards and scientific fact. Yet, unlike Le Corbusier, he believed it was essential to take into account the context in which a city developed. Like Haussmann's project for Paris, many of Doxiadis's views were also grandiose. But they differed in that Haussmann's focused primarily on the rearrangement of the terrain of an existing city while Doxiadis focused more on the expansion of existing cities beyond their present boundaries. In regard to the function-based group, Doxiadis also shared a trust that automobiles would be a facilitator for great future cities. And he believed in the importance of order and unity, top-down planning, and the imposition of a scientific neutrality based on the collection of large amounts of data. On the other hand, his approach contradicted that of the functionalists in several important respects. These included his belief in the value of human freedom, his admiration of old cities, and his advocacy of the scale of the neighborhood. These differences and the reasons behind them will be discussed later, as will the differences between Doxiadis's plan for Riyadh and prior modernist city planning efforts.

Doxiadis's approach also shared a number of ideas and visions with that of other three groups — although the differences were often more apparent. One reason for these similarities may be that his work largely postdated the emergence of those trends, and he was able to pick and choose between their arguments. In other words, since many of these views had been developed in response to the functional rationalism of the early modernists, he was able to selectively adopt them to strengthen his position and validate his practice. Doxiadis thus shared the conviction of the second group that humans should live in harmony with nature and that urban design should incorporate strategies to allow them to enjoy it. And like the form-based group, Doxiadis often emphasized the importance of aesthetically appealing designs, incorporating in his work measures to govern the appearance of both public and private buildings. He likewise always aimed to create a monumental fabric for his cities. Furthermore, in keeping with the views of the human-network group, he valued the neighborhood as a unit, and often claimed that his designs were intended to strengthen relations and links between different social classes. Though sometimes not apparent in his designs, his theoretical writings also contain many references to the importance of humane values in design (Doxiadis 1968).

In order to understand the context in which the DA plan for Riyadh was produced, it is also important to consider other master-planning efforts that were being engaged in the Gulf at around the same time as Doxiadis's project for Riyadh. During the third quarter of the twentieth century, a number of important master plans of comparable scope were produced for cities in the region. Catalyzed by the discovery of oil, the Arab countries of the region were going through massive transformations at the time, and their leaders turned to Western urbanists to provide them with

master plans for their principal cities. The plans were meant to provide a framework for a new future of economic prosperity, urbanization, increased aspiration, and population growth.[23]

In some instances, these efforts were undertaken by trained city planners, but in others they were the work of engineers, traffic specialists, and architects. Unsurprisingly, this engendered a wide range of plans that were similar in many aspects but also varied in their specificity, approach, and targets. In the case of Riyadh, of course, the work fell to the well-known international planning firm created by Doxiadis. But it was John Harris who worked on Dubai's plan in 1976; Katsuhiko Takahashi who developed designs for Abu Dhabi in 1971; Llewelyn-Davies, Ltd., who came to Doha in 1974; Munro who facilitated Manama's plan in 1968; Minoprio, Spencely, and Macfarlane who created Kuwait's in 1952; and CH_2M-Hill & CEG who were engaged to plan Dammam in 1980. Of these, the cases of Dubai and Kuwait may be most important to examine in relation to the work of Doxiadis in Riyadh.

The 1950s saw two main figures arrive on the scene in Dubai: Sheikh Rashid bin Saeed Al Maktoum and John R. Harris. Sheikh Rashid became the ruler of Dubai at the age of 30. A visionary with grand ambitions, he set out to plan actively for the future of the emirate. One of Sheikh Rashid's most famous sayings was, "What's good for the merchant is good for Dubai" (Archis 2010). Indeed, this would later become Dubai's motto, guiding its rapid urbanization and transformation into a global commercial center. The other critical figure at the time was John Harris, however. Sheikh Rashid needed a team to realize his vision, and for this he turned to British sources, given their existing connections to the emirate. Initially an engineer in the British army, Harris became an architect, graduating from the Architectural Association School of Architecture in London. At the young age of 38, he was hired as Dubai's first town planner in 1959.

Under the urging of Sheikh Rashid, Harris immediately began working on the city's first master plan, and the result, "Survey and Plan — Capital City of Dubai" was published in 1960 (Wiedmann, 2012) (Fig. 3-9). In the plan, which imagined the expansion of the small fishing town into the seemingly limitless desert around it, Harris proposed a "controversial and ingenious system of highways, rather than planning zones" (Kanna, 2011). He declared five principal objectives for the plan: the provision of an appropriate road system, the zoning of suitable areas for each urban function, the allocation of new areas for residential growth, the selection of sites dedicated to particular civic purposes, and the creation of a new town center in Dubai (Archis 2010).

[23] In the case of Saudi Arabia, for example, only 10 percent of the population lived in urban areas in 1950. This compared to 70 percent of the population in 1985 and 85 percent by 2005.

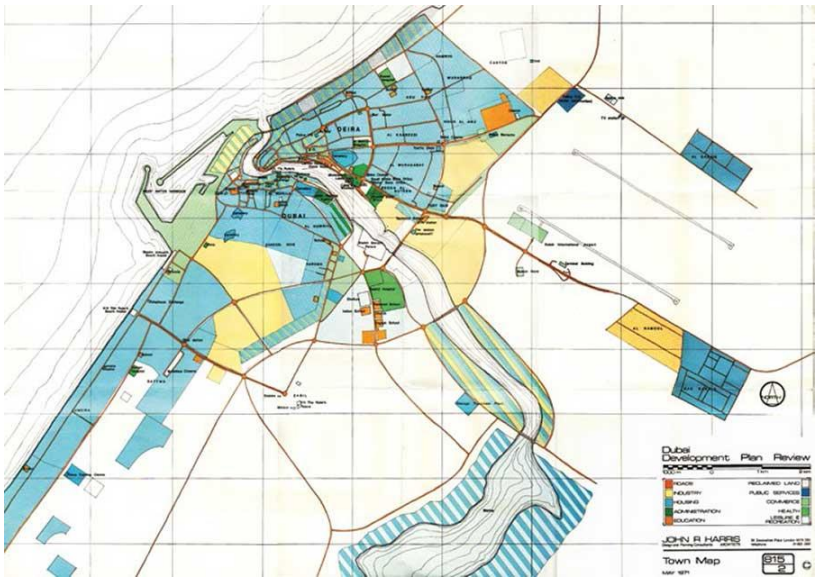

Fig. 3-9: Dubai Master Plan. Source: AMO, 2007.

Comparing Doxiadis's plan for Riyadh to Harris's earlier one for Dubai reveals a number of important similarities: both plans were heavily dependent on automobiles, with road networks comprising the backbone of their proposals; both were top-down proposals; and both were functionally driven, dividing their proposed future city based on efficiency and separation of uses. However, today, Doxiadis's plan appears far more sophisticated and thorough in its analysis of existing conditions and its proposals for future development. Indeed, Harris's plan appears one-dimensional compared to Doxiadis's. To begin, the Greek addressed the future city at a number of different scales and incorporated many layers in its proposed zoning and road network. Doxiadis's plan also emphasized data collection and analysis, while the Dubai plan simply proposed a physical form for the future city. On the other hand, one of the great strengths of the Dubai plan was that Harris's involvement did not end with the adoption of the plan; rather, the British architect remained involved in the city for an extended period and was tasked with overseeing its implementation and designing many of its components. He was also charged with updating it as years progressed. In hindsight, it is possible to see that Harris's ongoing involvement reduced the gap between plan intent and implementation, increased the accountability of government actors, and enabled the evolution and modification of the plan as circumstances changed.

By the time Dubai and the other Gulf countries had begun their initial master-planning work, Kuwait's process of urban development was already well underway. Thus, what its neighbors went through in the 1960s and 70s Kuwait experienced in the 1950s. Early in that decade, Kuwait's Development Board appointed the British planning firm Minoprio, Spencely, and MacFarlane to prepare a first-ever plan for Kuwait City. Kuwait had always retained strong ties with Great Britain, and this appointment was a reflection of such closeness. Yet, as Anthony Minoprio later reflected (Gardiner 1983), "[I]t was a difficult commission. We didn't know anything much about the Muslim world and the Kuwaitis wanted a city — they wanted a new city."

The master plan was released in 1952, but its lack of understanding of social context was clear in its details (Fig. 3-10). Minoprio claimed the plan was faithful to the traditions of Kuwait:

"[I]t was always my intention to keep things of value," he commented (Gardiner 1983). However, the plan was widely criticized as dismissive of the existing fabric and for clearing away many historical sites. Specifically, the old town walls were demolished, and the old city center was modernized by bulldozing new streets straight through it. According to Wiedmann (2012), "[D]uring the 50's the old city center became the new CBD and most traditional buildings were replaced with modern cement buildings." Sadly, the characteristics of old Kuwait City were largely wiped away in hopes of creating a new, modern city.

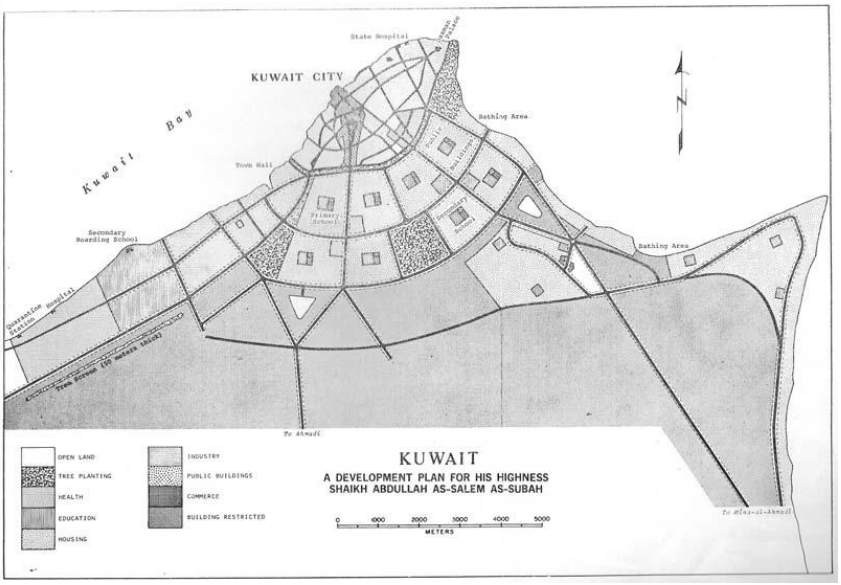

Fig. 3-10: Kuwait City's 1952 plan. Source: Gardiner (1983).

In its details, the Kuwait plan shared many qualities with other modernist proposals, especially the new town planning popular in England at the time. Thus it concentrated new urban development at the site of historic settlement in Kuwait, a small cape that created a sheltered location for maritime activities. The effect was to strengthen and reemphasize the notion of a city-state that had existed prior to 1952. However, the plan also specified a clear modernist separation of uses, with roads and zoning comprising its main component. The roads radiated from the five gates of the old city wall to intersect with three proposed ring roads, creating a network of "superblocks," or neighborhoods. Establishing an airport was another main goal of the plan, as Kuwait did not have one at the time. It also proposed a greenbelt that would follow the boundaries of the demolished town wall and create an edge for the city center. The land beyond this belt was imagined to contain new suburban development where only houses with gardens were permitted — no apartment buildings or any other structures of even moderate residential density were to be allowed there.

In hindsight, the 1952 Kuwait plan perhaps seems over-engineered. Indeed, Gardiner (1983) described it as "primarily a road plan" — lacking any of the subtlety that might have been characteristic of work by an architect, designer, or a planner. Nevertheless, it established the main guidelines for the growth of Kuwait City from the early 1950s through 1968, and it guided the establishment of most of the country's urban infrastructure. As the country's economy kept

improving, and as the benefits of oil exploration increased, however, Kuwait experienced a huge population influx, which put its original scope of design under great pressure. And eventually, it was determined that the 1952 plan was no longer sustainable, and the British town planner Colin Buchanan was hired to work on the second major master plan, which was released in 1968.

Much as in the case of Dubai, Kuwait's plan shares commonalities with Doxiadis's proposal for Riyadh. Like most plans proposed for Gulf cities, all three displayed a clear link to modernism, and were recognized as modernist attempts to construct cities of the future. They shared the typical features of such endeavors: an extensive road system, neighborhoods created in the intervals between road infrastructure, a clear division of uses, a top-down view, and an attempt to use scientific calculations to arrive at appropriate densities, building heights, and other physical features. Compared to Doxiadis's plan, Kuwait's plan exhibited some strengths, but its weaknesses were also very clear. Among its strengths was its attention to nature; thus, while both plans proposed that the city be bounded by a natural element, Doxiadis did not give this element much attention, nor did he aim to design it or incorporate it into his view of the future city. On the other hand, the bounding of Kuwait's central areas by a new green edge was a major feature of that plan. Furthermore, Doxiadis unrealistically proposed that his green edge would be a hard one, with no development beyond it. As will be shown in the following chapter, however, this proposal was soon rendered obsolete by escalating development pressure. By comparison, the approach adopted in Kuwait was more pragmatic: here the edge was important, but if development were to occur beyond it, the plan specified that it assume a particular low-density character — that it be dispersed but connected. This reflected the realistic position that a city is hard to contain and that a plan must incorporate a certain flexibility.

On the other hand, Doxiadis's position toward areas of old city fabric in Riyadh appears to have been more sensitive than the approach taken in Kuwait. Both plans were subsequently criticized for their treatment of the old town. Specifically, Doxiadis was faulted for not engaging with it as more than a historic artifact — as a museum to visit and admire. But the British planners went further, creating a new Kuwait City by simply bulldozing large areas of the historical core to create space for new highways. In Riyadh, roads were a main component of the plan, but Doxiadis designed other features of the plan carefully and paid particular attention to their scale and relation to one another. Kuwait's plan, by contrast, seems to have largely taken the form of a new road network, with very little consideration to other elements. This is the main reason it appeared to have been produced by an engineer rather than an architect, designer, or a planner. It was a dry, functional plan of superimposed infrastructure, whose other elements were largely left unaddressed and undetermined.

D. Personal Background

As shown in the last section, Doxiadis's project in Riyadh, like the other proposals for cities in the region, were designed in alignment with and in reaction to major streams of thought about city-building at the time. Most importantly, however, like other postwar planners, Doxiadis's theories and projects were inspired by what was widely perceived to be the dreadful decline in urban environments since the onset of the industrial age. Like many other planners at the time, he also realized the problems of cities could only be addressed by considering the city as a manifestation

of larger social and political forces. Yet, where other planners sought to scale up existing methods and practices to address a larger context, Doxiadis considered the problem of cities to be one of the preeminent dilemmas facing human civilization. Moreover, in what he imagined as the coming era of global urbanization, this would require a fundamentally new approach — a new science, one he called ekistics. Using this new scientific approach, he believed, it would be possible to engineer a new urban order that could respond to the changed condition of life in the twentieth century and beyond. A proper structure for human relations had always been what great cities had provided; the problem was how to achieve this given the impact of new mobility and communication technologies and the vast expansion of urban populations.

Doxiadis had been considering the problem of cities his entire life, and many of his ideas can be traced to his early experiences. His views had been profoundly shaped by the destruction he had witnessed during World War II. As a young planner the exhibition he produced for the 1946 U.N. conference in San Francisco had been titled *Such Was the War in Greece*. Using maps, photographs, and graphs, it had documented the extensive wartime destruction of his country's cities and towns and its desperate need for reconstruction aid (Theodosis 2016 p.20). Confronted by the need to rebuild urban culture across Europe and the world, Doxiadis quickly realized that old practices would have to be set aside. As he later came to reflect on those times, "Twenty-six years have gone by since I returned to Athens from Albania, where I had been fighting with the Greek army, and in passing through the devastated cities and villages I realized that I was unable to help give them a new life on the basis of my studies in architecture, engineering, and planning" (Doxiadis 1968).

As a Greek, Doxiadis's experiences with urban devastation had also not been limited to World War II (Fig. 3-11). As the general conflict in Europe neared its conclusion and Greece was liberated from German occupation in October of 1944, Doxiadis left the Greek resistance and began work as a reconstruction official in the fledgling postwar Greek government. However, as he and his colleagues sought to rebuild their war-ravaged country, it became embroiled in a civil war between forces loyal to the Greek Communist Party (which had established a "mountain government" during the last months of the war) and the internationally recognized anti-communist Greek government constituted in exile under British protection in Cairo. In some ways this conflict, which began when leftist groups refused to give up their arms, was a precursor to the proxy wars that later comprised the Cold War between the U.S. and the U.S.S.R., and that would define global geopolitics for the next four decades. Full-scale conflict raged across the country from 1946 to 1949, until the government was finally able to bring peace with the help of U.S. military assistance following the declaration of the Truman Doctrine of communist containment in 1948.

Fig. 3-11: Left: World War II destruction in the German city of Dresden.[24] Right: A soldier in Athens during the Greek Civil War. Source: Left: AFP/Getty Images; Right: *WWI Today*.

Doxiadis's experiences at the time solidified his view of a relatively benevolent capitalist West. And, despite the persistent threat of nuclear annihilation brought by the Cold War, the period was initially one of optimism related to the establishment of a new international political order based on the promise of the United Nations and its attendant institutions. Meanwhile, investment by the U.S. in the rebuilding of Europe and its global emphasis on modernization brought financial and technical assistance to many areas of the world. In addition to supporting noncommunist, nominally democratic regimes through direct government-to-government support, U.S. aid involved the work of private, nonprofit organizations such as the Ford and Rockefeller Foundations and the Congress for Cultural Freedom. Their efforts to support and promote Western values took a plethora of forms, from supporting education programs, to increasing agricultural production, to setting up institutions of microfinance. They also included attempts to enlist architects and urbanists in the redesign of cities and in campaigns to address the massive deficit in urban housing (Theodosis 2016).

Doxiadis had begun his involvement in the Greek government during the time of the Civil War, working in the Ministry of Housing and Reconstruction, first as an appointed undersecretary and then as director-general between 1945–1948. Later, he became minister-coordinator of the Greek Recovery Program and undersecretary of the Ministry of Coordination (1948–1951). In all these positions, he was closely involved in the allocation of international recovery and development aid. His work also brought him into close contact with leading U.S. academics and foundation administrators, who frequently acted in coordination with the U.S. government to fund pro-Western cultural initiatives. Through his office as a government official, Doxiadis established the basis for the support he would receive later in his career from American institutions. He was an official who could be relied upon to counter socialism and communism in Greece.

Despite the problems caused by overreliance on government employment, the persistence of black markets, and periods of hyperinflation, Greece's efforts to reconstruct its cities and

[24] Where some European cities were not as severely damaged because of their dispersed urban form, Dresden was highly concentrated, with a great number of wooden structures. In one night of firebombing, on February 13, 1944, about 90 percent of its central area was completely destroyed (*The Guardian)*.

develop a postwar economy were eventually successful.[25] Yet during those years Doxiadis, who had himself been a refugee as a child,[26] witnessed firsthand the dreadful environments in which people were forced to live in the war's aftermath. "Suffering in cities is really a global problem," he declared. "There is no city which does not suffer a great deal." The difficulty of recovering from such a catastrophe also strengthened his awareness of the limits of existing city-building methods and convinced him of the necessity of adopting new ones. In his thinking, Doxiadis also attempted to balance two contradicting trends: the simultaneous growth and decline of cities. On the one hand, the destruction of urban society across Europe had made him intimately aware of how miserable human life could be without functioning urban environments. Yet, he also recognized the critical social and economic challenges being posed by the massive rural-to-urban migration that had begun at the war's end — a trend that showed no signs of abating and that was leading to predictions of "global urbanization." Doxiadis himself predicted that the world's emerging megacities would grow ever larger and that the total global urban population would escalate from 33 percent in 1960, to more than 93 percent in 2100. Ultimately, he imagined the formation of one interlinked urban global system, which he referred to hopefully in his writings as "Ecumenopolis." "The major problem concerning humanity today [is] the population explosion, which will definitely be the most decisive factor in the next phase of human settlements," he contended in 1968.

Like other urbanists, Doxiadis was thus convinced that existing ideas about city form were no longer relevant. To meet the increasingly urgent needs and challenges of the present, cities would need to become fundamentally different. "The unsatisfactory conditions of our settlements are becoming worse with every passing day," he asserted. And given existing city-building frameworks, "we have no reason at all to believe that we are creating better conditions for tomorrow" (Doxiadis 1968). However, Doxiadis disagreed with those who argued that the very idea of dense urban living was flawed, and who aimed to create radically more dispersed settlement patterns. As I pointed out in the last section, many advocates for such a future traced their lineage to the Garden City movement, which had grown from the turn-of-the-century work of the English planner Ebenezer Howard.[27] Peter Hall, the political geographer, has put this movement into historical perspective by claiming that what Howard was actually proposing was the colonization of parts of England around London to alleviate the plight of worker housing, and this was more miserable in terms of its condition than in terms of absolute density (it generally took the form of row housing) (Hall, Pérez, and Levy 2014). The views of others, such as Frank Lloyd Wright, with his distinctly expansive midwestern U.S. proposal for Broadacre City, were more idiosyncratic.

[25] While the reconstruction was not easy, Greece was relatively successful in its efforts in economic terms. Through the following two decades its economy witnessed a healthy growth rate that averaged at 7.7 percent, which was the second highest number in the world during that period, following only the Japanese economy. For more on the country's recovery, see C.M. Woodhouse (2018).

[26] Doxiadis was born in 1913, in Stenimachos of Bulgaria, a Thracian city where Greeks constituted an ethnic minority until the population exchange that followed the First World War. His father, Apostolos Doxiadis, was a pediatrician who served the Greek government as a Minister for the Resettlement of Refugees, Social Welfare, and Public Health. In this capacity, he was responsible for the medical care and sheltering of approximately 1.5 million Greeks who were repatriated in the aftermath of the Greco-Turkish War (1919-1922) (Theodosis 2016, p.17).

[27] Howard's Garden City was built on the assumption that people have only two options; cities or countryside. Garden City thus provided a third alternative (magnet in Howard's language) that combines the positives of both but without their negative implications. "Neither the town magnet nor the country magnet represents the full plan and purpose of nature. Human society and the beauty of nature are meant to be enjoyed together" he wrote in his 1902 book *Garden Cities of To-morrow.*

Against all such claims, however, Doxiadis was an unapologetic champion of cities. He argued that planners had an obligation to fight the myths about the evils of city life. In order for planning as a profession to advance and cope with new future challenges, it had to recognize the vital necessity of cities. It was not decentralization that would form the basis for a future utopia but newer and more responsive forms of centralization.

Defending the city against attacks by those who sought to decentralize it, Doxiadis argued that such efforts did not recognize the necessity of density and concentration. “We should accept the very big city as a concept because it is already a fact,” he wrote. “As long as we do not recognize it, we will not achieve anything.” As he saw it, the Garden City movement and the projects of Howard’s followers such as the postwar British New Towns would never work, regardless of their specifics. They were “wrong about their desire to escape from reality by building their small community in isolations from the world, because this is not reasonable any longer” (Doxiadis 1966). Despite its humanitarian intentions to alleviate concentrated poverty, improve housing conditions, and create positive new environments in harmony with nature, efforts to disperse urban populations lacked valid cultural basis. “Is it really good to take a man, even out of a slum, and put him twenty miles away from the city center with all its facilities?” Doxiadis asked (Deane 1965). The reality across the globe was in fact mass migration of rural people into cities in search of cultural and economic opportunity. And yet while Doxiadis did advocate compact cities in his proposals (at least in comparison to Howard’s visions), his residential blocks were never particularly dense — a contradiction that will be explored further in later sections.

Doxiadis saw two other problems with contemporary proposals. One involved his fear that letting cities grow in a piecemeal manner would allow parts constituted near each other (either as a result of history or design) to merge in a disorderly, inefficient manner. The other was that postwar planners (such as Backema and van der Broek in their formal schemes for Amsterdam and Candilis-Josic-Woods in their plans for Toulouse Le Mirail) were merely adding new increments of form at the same scale as the old ones without considering how a strategy was needed to create order on an entirely different scale.

Particularly concerning to Doxiadis was the problem of multinucleated urban form that was emerging as a result of rapid and extreme growth. When too many satellite settlements were established around an existing urban center, either to house new urban migrants or to create more bucolic living conditions for former residents of dense inner-city areas, they could not help growing into each other and defeating the very purpose for which they were created. Although such a strategy might thus initially appear to ease the pressure on older, central areas, over time, it would ultimately increase it. This was because the new areas still relied on older, central ones for their business and institutional functions. The central city would thus continue to expand, but it could only do so in an inefficient and disorderly manner that required the continued reordering and redevelopment of established patterns of settlement over time. To his way of thinking the only solution to this dilemma was the inscription of a new, comprehensive sense of order over an entire urban region. Only this could guarantee the continued growth of a city and the continued efficient functioning of its central areas without having to accommodate the competing spatial forces generated by its satellites. To achieve this sense of order in an age of unparalleled mobility, Doxiadis embraced the potential for order offered by a unified spatial grid.

As a rational structure for unlimited growth that could be extended to fit any urban condition, the use of a grid as a solution to settlement planning had initially been proposed by the fifth-century BCE Greek urban planner Hippodamus of Miletus (Theodosis 2016, 167). However,

Doxiadis's embrace of grid-based design was also emblematic of a preoccupation with formal clarity that was typical of modernist urbanism (Pyla 2008). Indeed, the use of a universal grid was perhaps the most characteristic feature of his response to the problem of urban growth. As had Hippodamus, Doxiadis viewed disorder as antithetical to the development of urban life. In this regard, his search for the hidden order of ancient Greek cities in his Ph.D. at the Berlin Charlottenburg Polytechnic Institute [Berlin Charlottenburg Technische Hochschule] in the mid-1930s also constituted one of his earliest contributions to urban theory.

A young Doxiadis had initially been attracted to the traces of modernism that had found fertile ground among artists and architects in the 1920s and early 1930s in Germany after the fall of the monarchy in 1918. And he was especially attracted to the Bauhaus, which was one of the many art and design movements popular at the time.[28] Yet, ironically, by the time he arrived, modernist city planners had largely being driven out of German institutions by the rise to power of the Nazi party.[29] Despite his early embrace of modernism, however, Doxiadis's principal research interest did not appear to conflict overtly with developing political trends. And even in his future writings and designs, Doxiadis seems to have chosen to be silent about his time in Berlin and the political contexts in which he studied. This approach was unlike that of some of his colleagues. Tyrwhitt, for instance, openly admitted to being curious about the prospect of practicing under a totalitarian regime, questioning what it might have been like to design and plan in a political milieu with no limitations. Doxiadis, on the other hand, rarely addressed such political issues. The quintessential salesman, he regarded neutrality as of utmost importance, because taking sides on such a contentious issue might jeopardize future commissions. Nevertheless, the fact remains that during Doxiadis's studies, Gottfried Feder, a civil engineer, was the chair of town planning at the Polytechnic Institute. And Feder was an early member of the Nazi party with clear ideas on the role of design and town planning in supporting the movement and spreading the Nazi ideals. Doxiadis studied under Feder, and Feder even approved Doxiadis's dissertation. After two years spent on research, that dissertation, "Die Raumgestaltung im Griechischen Städtebau," was published in 1937. Translated into English by Tyrwhitt in 1972 as "Architectural Space in Ancient Greece," it has continued to stir debate.[30]

The main purpose of Doxiadis's work was to investigate an underlying feeling of order he had experienced during his earlier visits to some of Greece's antique sites — a feeling he had not experienced in his travels to more contemporary towns. What he thus set out to find was order amid expected chaos, logic and rationale within anarchy — a quest that he kept pursuing until the later stages of his career, including his work in Riyadh. The main question he proposed was, "What

[28] Neue Sachlichkeit, Blaue Reiter, De Stijl, and Deutscher Werkbund were all examples of modernist movements that existed at that time.

[29] In July of 1932 the National Socialists (Nazis) became the largest party in the German Parliament, and in January 1933, Adolf Hitler was appointed as Reich Chancellor and head of the cabinet. The party spent the following years consolidating power and uniting their followers under populist slogans of hate and superiority. The Bauhaus as an ideal, and the rational modern approach to design, were referred to by the Nazis as an art not worthy of Germans, and under the National Socialists design training reverted back to a nostalgic "stripped Classicism" that could be used to express the power of the state and uncritically romanticize a heroic Aryan past.

[30] According to Philip Deane (1965), "Doxiadis' thesis caused a sensation. Orthodox archaeologists, in anguish, took to the press to attack the impudent youth." Among recent scholarship exploring his dissertation is *From Doxiadis' Theory to Pikionis' Work: Reflections of Antiquity in Modern Architecture* by Kostas Tsiambaos. In this 2018 book, Tsiambaos compared Doxiadis's theory to the work of the controversial Greek architect Dimitris Pikionis, and he argued that, while Doxiadis's dissertation dealt with ancient sites, its theories could only be understood as founded in modernity.

was the secret of the system of architectural spacing used by ancient Greeks, which had the effect of satisfying man and uplifting his spirit as he entered a public space?" During the course of his research, Doxiadis investigated 29 different ancient sites, some of which were in better condition than others, but only eight of which could at the time have been considered undamaged or reconstructed to a fairly accurate standard.[31] He had already visited most of these sites during his previous studies in Athens. But as a doctoral student he now had the luxury to explore them in depth and compare his observations with the archaeological findings of his colleagues in Germany.

Common belief at the time was that ancient Greek cities were mostly built to be beautiful and attractive, but without a plan or logic. But Doxiadis's proposition was that they were arranged and designed based on a complex system that contemporary Western scholars had failed to recognize. As he wrote, the common perception was that these sites were only built to "satisfy the aesthetic demands of modern man for an ideal layout, an ideal city, unrelated to actual time and place" (Doxiadis 1972). Urban historians thus considered each of their component structures to be an isolated element, built only for the purposes of beauty. But, as he argued, "We have failed to recognize that the urban layouts of the archaic, Classical, and Hellenistic periods were organized on the basis of a precisely calculated system" (Doxiadis 1972). It was only because contemporary scholars did not understand that logic that they viewed the layouts of these sites as arbitrary and/or chaotic.

Doxiadis believed that the failure to appreciate their logic derived mainly from the development of new methods of urban planning. In particular, architects and planners in Doxiadis's time practiced their craft mostly abstractly, according to a two-dimensional view. They devised plans and elevations according to a coordinate system with only two axes. By contrast, ancient Greeks developed their designs on site, within existing settings. They were thus not subject to the laws of bi-axial composition that seemed arbitrary to the untrained eye (Fig. 3-12).

[31] The sites Doxiadis visited were mostly in bad condition. Out of the 29 sites, only eight could then be considered to be in a decent condition: Athens Acropolis 3, the Asclepeion at Cos, the Agora at Miletus, and the sanctuaries of Aphaia at Aegina, Athena at Pergamon, Zeus at Priene, Demeter at Silenus, and Poseidon at Sounio. As he explained, these represented a small sample, and thus "do not suffice to demonstrate an irrefutable argument concerning the Greek system of planning." He thus acknowledged that his arguments were imperfect, but hoped that they would open a scholarly path for other people to follow, develop, and even provide alternate evaluations of.

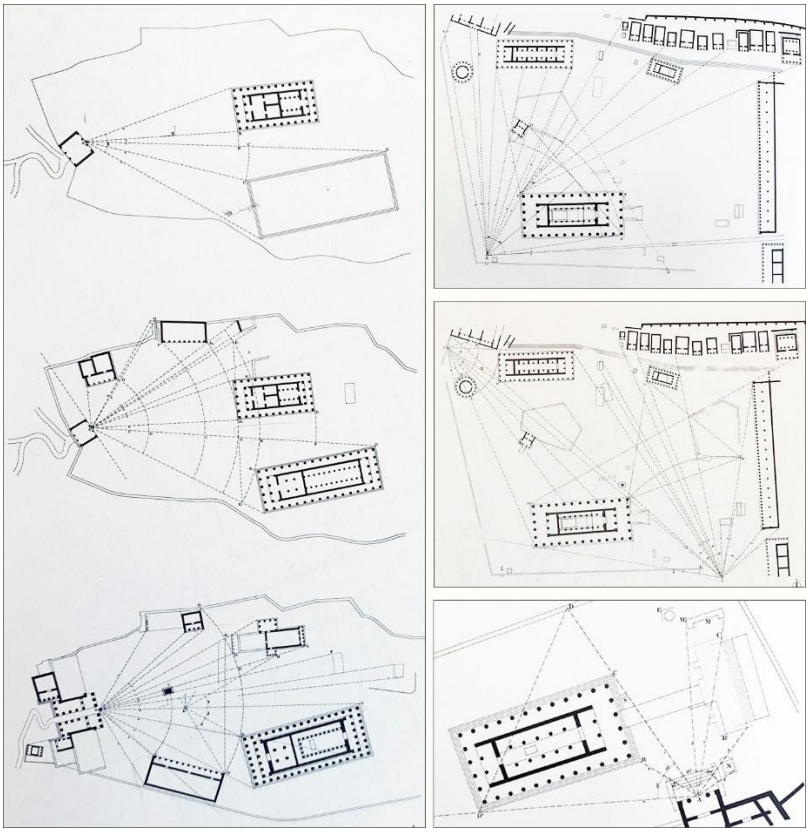

Fig. 3-12: Finding logic within chaos: diagrams from Doxiadis's dissertation. Source: Doxiadis (1972) "Architectural Space in Ancient Greece."

Using these insights, Doxiadis discovered how the design and placement of urban elements at these sites were governed by a logical system of spatial organization and a complex set of relationships based on situated human experience. In his dissertation, he then argued that the elements of the complexes he had studied were not built as isolated objects, "but as parts of a dynamic urban environment." As elements of a city, they were, "subject to contemporary conditions of growth and change." And yet, because these sites were continuously structured based on principles of human cognition, a person's needs would always be satisfied when he or she visited them. Indeed, the entire system was built around human perception. As he showed, the most decisive factor guiding all design decisions was the appearance of urban elements when glimpsed from certain viewpoints, the most important of which were often major entry points. The layout of all elements within the system could thus be determined by their distance from these points and the angles at which they were viewed (Doxiadis 1972).

In more technical terms, Doxiadis proposed that a system of polar (not cartesian) coordinates provided a basis for site planning in ancient Greece. And from his study, he enumerated a series of principles as general laws governing the construction of ancient Greek sites. These took the form of mathematical laws, regulations regarding relationships and viewpoints, and conditions of movement. There were some variations to the system, especially related to mathematical formulas, but in general, the laws persisted for centuries. What differences existed through time were mainly a matter of differences in attitude toward sacred and secular spaces. At the end of his

dissertation, Doxiadis then claimed to have substantiated his theory that the design of ancient Greek sites was far from arbitrary. Doxiadis believed it was impossible that such a condition could have been created by accident, and his Ph.D. dissertation represented a quest to formulate a theory that would prove those sites had been successful because they met the needs of their residents for order and rationality.

Many elements of Doxiadis's approach toward planning developed and changed through his career, some more drastically than others, but a few of them remained remarkably consistent. It is thus possible to trace the roots of some of his later professional and scholarly work to arguments he made in his doctoral dissertation. One of these was his enduring belief that any successful city is built on a basis of a highly engineered order and a set of detailed relations and systems, even if it at first appears chaotic to the untrained eye. Using a scientific approach, he believed he had managed to reveal how Western perceptions of Greek culture had previously failed to appreciate this quality. Likewise, most of his later theory and practice attempted to use the same scientific approach to show how it was being lost in the development of modern towns and cities.

To Doxiadis's way of thinking, the introduction of cars and advances in building materials, while holding massive potential, had changed the morphology of existing cities and led to chaotic conditions. An overall new sense of order was thus the preeminent quality that planners needed to restore to them. To do so, however, required a dynamic rather than a static approach. Older cities had been able to successfully endure over time because they had been able to adapt to social and technological changes. Effective urban projects, ones that enhanced human life, should thus be "part of a dynamic urban environment, . . . [A]s elements of a city they [must be] subject to contemporary conditions of growth and change." (Doxiadis 1966). Most importantly, however, being adaptable and fluid should not be confused with being disorderly and chaotic (Fig. 3-13). On the contrary, Doxiadis believed that a city that could continue to satisfy the needs of its residents could only be realized through strict order. While its details might change and be worked out on a local level, this openness to change would always be contained within a strong framework. Such a principled and consistent vision of urban form could only be provided by the designer in the role of a benevolent technocrat applying the wisdom of engineering. In that sense, Doxiadis supposed that the planner should function as a master builder, a higher authority who "should create the framework for a very orderly formation of the universal city at all its levels" (Doxiadis 1966).

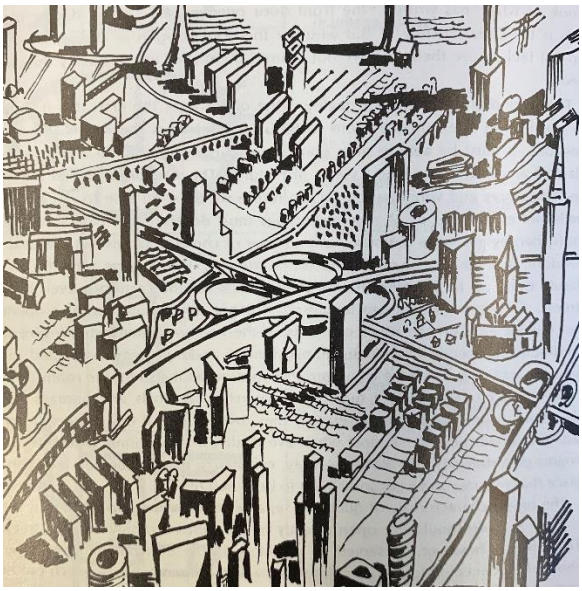

Fig. 3-13: Doxiadis captioned this picture, "A bird eye view of the city transmits one message: there is no order in our life system." Source: Doxiadis (1977) *Action for Human Settlements*.

As a man of many contradictions, Doxiadis ultimately considered such a totalizing view of the necessity for urban order to be completely consistent with the attainment of maximum human freedom and liberty. In that regard, his views were similar to other modernist designers, whose work reflected larger social and political agendas.[32] Like these other modernists, Doxiadis was concerned that existing cities, which appeared to be growing "freely," without order or intention, were actually stripping man of his freedom. "We have lost our ability to act and think freely in our cities. We think we drive the car, in fact the car drives us," he wrote. He further asserted that in poorly designed cities, ones without the benefit of science or human scale, "the right of the citizen to govern his own affairs will be too theoretical to matter; it will be crushed not by tyranny but by concrete." (Doxiadis 1975).

"As the problems pile in on the dinosaurs that our urban conglomeration become, there will be less and less freedom, his [resident] political choices will be meaningless" (Deane 1965). The future Doxiadis imagined would combine man's complete autonomy with decisive authority and the orderly governing of the planner. It may seem contradictory, but in his view, if the city could be predetermined and designed to its smallest detail, every aspect of human life could be engineered to enable conditions of harmony, peace, and freedom. Powerful planners, the master developers, should engineer the perfect order and system. If every person were free to operate within that system, the opposite visions could be combined.

[32] For instance, the Bauhaus school believed that the creation of standardized new physical forms would lead to progressive social change. Good designs — ones that were simple, pure, and applicable anywhere and for everyone — would encourage equality. Le Corbusier's radical urban restructuring was premised on a similar vision — even if, as Jane Jacobs later observed, its ideal meant "not liberty to do anything much, but liberty from ordinary responsibility." And Frank Lloyd Wright's proposals for Broadacre City imagined a world in which people could live by their own labor if necessary, and be free of exploitation to enjoy the lifestyle of their own choosing — even if, as Fishman (1977) has reasoned, Wright's democracy implied that people could live by Wright's own standards.

E: A New Science of Human Settlements

Some say a picture can speak louder than a thousand words, and if one picture can indeed speak louder than words and summarize Doxiadis's emphasis on a scientific approach by planners, it would be the one published in *DA Review* (Fig. 3-14). *DA Review* was a monthly publication that first appeared in 1965 and whose last issue was published in 1982. Its primary purpose was to enable DA to showcase and market their ventures. It thus included articles on the progress of DA projects and on Doxiadis's trips, lectures, and presentations, among other things. In the picture, Doxiadis and several colleagues are occupying a movable cage lifted above a large-scale model of Athens. Floating there, Doxiadis points from above to a specific element in the city's model. What Doxiadis is doing is "planning." He and his associates wear the white robes typically worn by scientists working in a lab or doctors making their rounds in a hospital.

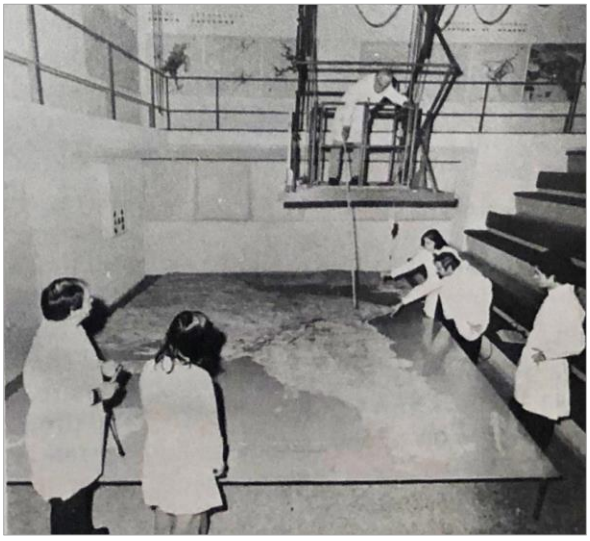

Fig. 3-14: Doxiadis and his team "planning" Athens. Source: *DA Revie*w.

Interestingly, the picture was not intended to capture a special moment; similar pictures exist of Doxiadis and his team working in a similar way on models of other cities.[33] Nevertheless, it provides an apt metaphor for how Doxiadis imagined his role. Like scientists in a lab, in this case they are organizing a better future for their home city from a bird's-eye view, far from the local population. Moreover, the caption for the picture reads: "The medicine we need for our cities is called ekistics, the science of human settlements." And it adds: "Real medicine starts with the parental phase and follows the patient to his death, we must create a scientific approach to help out cities!"

Ekistics, as a theoretical construct, encompassed most of Doxiadis's ideas and was without a doubt his greatest intellectual achievement. As Bromley (2002) has pointed out, "unlike

[33] For example, a similar picture of Doxiadis's team working on the plan for Islamabad has appeared widely, including as part of a Doxiadis exhibition held in Athens by Benaki Museum, and in Sakka (2019). Another picture of the team working on Baghdad is also popular.

sociology, economics, and other conventional academic disciplines, where many great minds have contributed a wide variety of different theories and principles, ekistics still consists mainly of Doxiadis's ideas." For his work advancing its ideas, Bromley labeled Doxiadis an "intellectual entrepreneur." Not only did Doxiadis invent the theory and establish it as a separate field of study, but he promoted it incessantly, publishing more than twenty books and hundreds of articles, many with the word ekistics in the title. He also gave countless lectures and talks on the topic and founded and published two journals, the more scholarly of which was simply called *Ekistics*.[34] Indeed, he was so committed to selling his vision that he described himself professionally not as a planner but as an "ekistician."

Doxiadis further imagined that, in addition to being a theoretical construct, ekistics would vastly modify planning practice. "Ekistics cannot be limited to analysis," Doxiadis asserted decisively. "It must advance to policies, programming, and planning, in order to be able to help man to survive" (Doxiadis 1968). By grounding his theory in practice, Doxiadis hoped to avoid the shortcomings of other modernists. Thus, planning would no longer reflect arbitrary aesthetic positions; it would become the rational product of algorithms, formulas, and data analysis. Ekistic solutions would be built on theoretical principles but provide optimal, pragmatic answers to real challenges.

The term ekistics, itself, which he described as "the science of human settlements," stemmed from the Greek word *oekismos*, meaning "settlements." As a rational and scientific activity, its development as theory was intertwined with Doxiadis's own experience. In World War II, fighting in the Greek resistance against the Nazis, he had led a team of saboteurs that employed science to methodically pick German targets, detail enemy movements, and carefully calculate the amount of explosives required to do the most damage (Deane 1965). And after the war, prior to founding his own planning practice, his work as a civil servant in the Greek government introduced him to the necessity of thorough project administration.

Doxiadis himself claimed that he began developing his vision of ekistics in the mid-1940s. Because designing a city was an extremely complex process, he proposed that the new science needed to consider the task from various angles (Fig. 3-15). At that time, interdisciplinary work started to gain momentum within scholarly fields, perhaps less so in urban planning. But Doxiadis started that movement, where as part of a larger "systems" approach, the shaping of the physical form of a city could not "rationally" proceed without taking into account the expertise of economists, geographers, sociologists, anthropologists, and other disciplines. No longer would a restructuring of physical space be all that was needed. "Having considered the achievements of other studies," wrote Doxiadis, "our conclusion was that the only proper approach is the Ekistics one of considering the system of human life as a whole" (Doxiadis and Papaiōannou 1974). And not only would such an approach move it away from what he considered the arbitrary domain of the individual planner, but it would take the activity of planning out of the physical context of the city so it could be considered in the scientific milieu of the laboratory.

[34] The other, *DA Review*, was devoted more to the professional work of the firm.

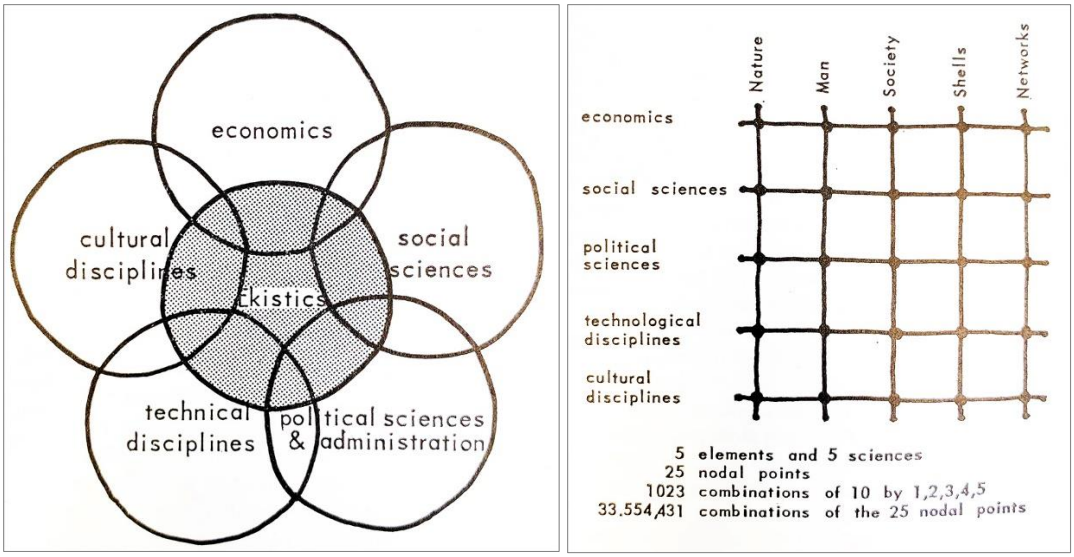

Fig. 3-15: Doxiadis's diagrams explaining ekistics, his main theoretical construction. Source: *Ekistics* (Doxiadis 1968)

This dispassionate, all-seeing approach is what the image shown at the beginning of this section was intended to convey. By hiring a firm like DA rather than one that practiced planning in a more traditional manner, a client would be guaranteed to receive a product that considered an urban problem from every relevant angle. Work in the field would also be based on a comprehensive theory of human settlements, extending from the needs of the individual citizen to the organization of vast new urban regions.

All of these theoretical principles were eventually detailed in a book with the same title, published in 1968. Ekistics enumerated a series of 54 laws meant to govern and determine the form of not only the ideal city of the future but also the correct structure for all human settlement. The laws could thus be used as strict guides for ekisticians to follow as they went about planning future settlements, no matter how large or small. Doxiadis divided these laws into three groups based on their function with regard to this process: those that referred to a settlement's life cycle; its internal balance; and its location, structure, and form.

Bromley (2002) has distilled these 54 laws into fifteen main principles. The first of these concerns the overall ekistic conception of human settlement and the problem of organizing it so that it can respond effectively to human needs. In this respect, the laws define all human environments as having five elements: Anthropos (people), nature, society, buildings (which he called shells), and networks (for communication, physical mobility, administration, etc.). The laws then propose the existence of fifteen scales of settlement form, from the surroundings of the solitary individual, to rooms, dwellings, towns, cities, regions, and the global urban future. The principles of ekistics then propose that human needs and activities at all these levels could be organized rationally according to a nested hierarchy of functionally defined central places. Thus, every design challenge may be conceived as having an appropriate scale of analysis and resolution, which can be related to the resolution of issues at the next largest and next smallest scale. Because

of the changing quality of all human environments, the ekistic approach also specifies that every design proposal be framed in relation to its continued elaboration through time.

The next set of principles identified by Bromley (2002) concerns the larger purpose, scope, and structure of ekistics as a science. Thus the ekistic framework imagined that economic development, urbanization, and technological progress are all inexorable forces. However, any development problem could be overcome by the concentrated effort of specialists organized into teams by a trained ekistician. To advance the interests of all humanity, one of the purposes of this work would be to narrow the gap between the rich and the poor. But the development of human settlements should also be considered within an ecological framework so as to ensure the sustainability of human life on earth. When ekistics was developed, national governments were best able to undertake campaigns to organize and direct the ongoing and inevitable process of urban settlement formation. And within these efforts, housing programs were particularly crucial because they could be used to shape all other aspects of city life. But eventually international organizations would be needed to coordinate regional networks on a global scale, because the future of all human settlement was converging toward a single interconnected global urban network with a peak population of between 15 and 50 billion people, called Ecumenopolis.

The last five principles identified by Bromley (2002) concern the forms of building that were most likely to achieve this vision of a global, interconnected, sustainable, urban future. Thus the science of ekistics proposes that all future cities adopt grid plans to ensure integrated physical order at a continuously expandable scale. However, through the layout of utility and transportation corridors, superblocks, walkable neighborhood units, and public recreational spaces, the demands of ever-increasing urban scale might be harmonized with the human need for a sense of local physical community. For this reason, cities should primarily be composed of a dense low- to mid-rise fabric that would be human-scaled yet dense enough to ensure the functioning of public transportation. Unlike previous modernist visions, ekistics shunned high-rise development and a total embrace of private motor vehicles because these hindered the development of the sense of local community needed to support the functioning of healthy human societies. And to preserve cultural heritage, it also proposed that existing historical city centers be protected by directing physical growth away from them. Likewise, the existing central areas of cities would not need to be continually reorganized to preserve their functioning within evolving urban regions because the urban center itself would be conceived of as continually expanding in an open-ended linear fashion.

As this synopsis reveals, the purpose of ekistics was to produce an efficient form for all human settlement as a way to achieve the larger human goals of freedom and happiness. However, it positioned the professional urban planner as an international master builder who should be allowed to structure all aspects of urban life. Thus, the coming global urban future would be realized not by politically motivated government officials but through the guidance of benevolent technocrats. The practice of ekistics thus embodied a paradox. The city of order and regularity was meant to free humanity from the tyranny of inefficiency and disorder. But to reach this condition (which Doxiadis believed the ancient Greeks understood), the ekistician needed to forcefully impose his vision from above using the detached perspective of science. The attainment of the extreme order that the laws of ekistics would bring would thus guarantee maximum freedom but depended on giving the ekistic practitioner almost total control over the management of physical space.

Doxiadis understood that this notion was controversial and contradictory, and that the intuitive position was to choose either order or freedom, not to combine them. “When I speak in these terms [of order and control], people are afraid that they are going to be imprisoned within rigid social and physical frames. . . . on the contrary, a proper organization of society and its settlements is going to allow the highest imaginable degree of freedom at all levels” (Doxiadis 1966).

F. Mobility vs. Locality

At the time Doxiadis was developing his proposals for a comprehensive new science of human settlements, the world was experiencing an explosion of automobile usage. This had been made possible by industrial mass production, government investments in road infrastructure, and the development of seemingly limitless supplies of cheap gasoline and other petroleum products. Like other modernists, Doxiadis was fascinated with technological advancements generally, and he believed they would transform the morphology of cities. Among these, he viewed the motor vehicle as a major force that would offer a solution to the concentrated poverty and unsanitary conditions of existing cities and improve the quality of human life. But he also recognized the problem posed by technological disruption, and this was nowhere more evident than in the damaging effect of automobiles on the fabric of existing towns and cities. For this reason, ekistics took great pains to address the movement of people, goods, and ideas as part of a comprehensive new frame for urban development. In addition to man, nature, society, and shells (buildings and other structures), ekistics thus specifically referred to a fifth element of human settlement, “networks,” which took into account roads and other forms of human connection (now commonly referred to using the neutral term “infrastructure”).

Ultimately, Doxiadis’s position was that motor vehicles could usher humanity into a better future by greatly enhancing the range of experience and access to goods and services (Fig. 3-16). But the introduction of motor vehicles into older urban forms had also been responsible for many aspects of their accelerating decline. Doxiadis believed those troubles were due to the fact that cars, being a relatively recent invention, were not embedded in the logic of older cities. Such cities were simply not built in a manner that could account for their presence, and the outdated fabric of older cities was thus unable to unlock their full potential. As he wrote, cities “are dying because of the battle between man and his machine, a fight that paralyzes both the combatants.” He added that “the motor car is making it impossible for cities to deal with existing demands” (Deane 1965).

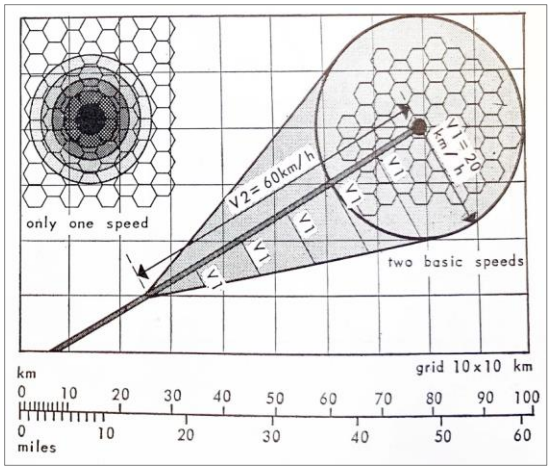

Fig. 3-16: Automobiles' potential: settlements and a new speed of transportation. Source: *Ekistics* (Doxiadis 1968).

Cities of the future could, however, move beyond these conditions if they truly embraced the overwhelming utility of motor vehicles and centered it in the city-building process. According to Doxiadis, the fact that they had helped create the existing dreadful situation "should not deter us from recognizing that they [automobiles] must become much more elaborate in order to help humanity survive in the new era it has entered, where technological forces generate new and much more complicated situations" (Doxiadis 1968). It should thus be taken as axiomatic that automobiles would change underlying notions of scale and time, that they would allow people to travel at much higher speeds, and that they would allow people to live in a larger city. Thus, Doxiadis wrote that "entopia," his vision for an attainable ideal future city, "is going to rely on much higher speeds, of many hundreds of miles per hour, for the connections of its cells" (Doxiadis 1966).[35]

In the city of the future imagined by ekistics, vehicular circulation would not be an afterthought requiring an awkward process of adjustment. Motor vehicles would provide a foundation on which the city was built. In practice this future car-dominated city would thus feature an extensive road network that could be used to establish many other parameters. Roads would in other words provide a skeleton onto which other components would be attached. Most of DA's projects were built on this theoretical premise. Their first and most significant element was typically an extensive grid of high-speed roads intended to establish the basic structure of the city and guide its growth. The automobile city was no longer a disease; it would provide a cure for human suffering by allowing a new age of urban living.

In many ways Doxiadis's attitude toward automobiles aligned with other modernist approaches championing mobility as an answer to the problems of the twentieth-century city. Yet, just as he sought to embrace the motor vehicle in theory and practice, he also critiqued earlier

[35] Doxiadis published a book titled *Building Entopia* in 1975, which was an explanation of how to build his utopia. In it, he describes it as "the city of dreams that can come true, and not remain unrealistic." It is a city that combines the imagination of previous utopias but presents them in a practical way that is achievable. Entopia, as he explained, will not be built tomorrow, but "we need to start the process by laying the foundations" — it is his attempt "to lead humans back to the harmony they badly need."

functional, modernist schemes because they embraced mobility to excess. Unlike earlier modernists, Doxiadis defended the critical role played by the scale of individual human perception, claiming that "it is widely recognized today that settlements must be human, not only in content but also in quality" (Doxiadis 1966). The work of DA thus often aimed to reach a delicate and difficult (some might even argue impossible) balance between utilizing automobiles' full potential and retaining the human scale in cities.

According to his reasoning, cities of the past, like those of the ancient Greeks, had succeeded because they were built to support the development of physical, human-scaled communities. While cars greatly extended the range of human activity, experience had shown that the increase in speed they allowed was harmful to the development and maintenance of a slower, more carefully constructed social milieu. To negotiate those two contradictory tendencies, ekistics imagined the design of all future human settlement as being structured according to a nested series of centers to support daily social life (Fig. 3-17). Where the larger scales could thus be dominated by high-speed mobility, the smaller ones would largely be set aside for the realization of more intimate social relations.

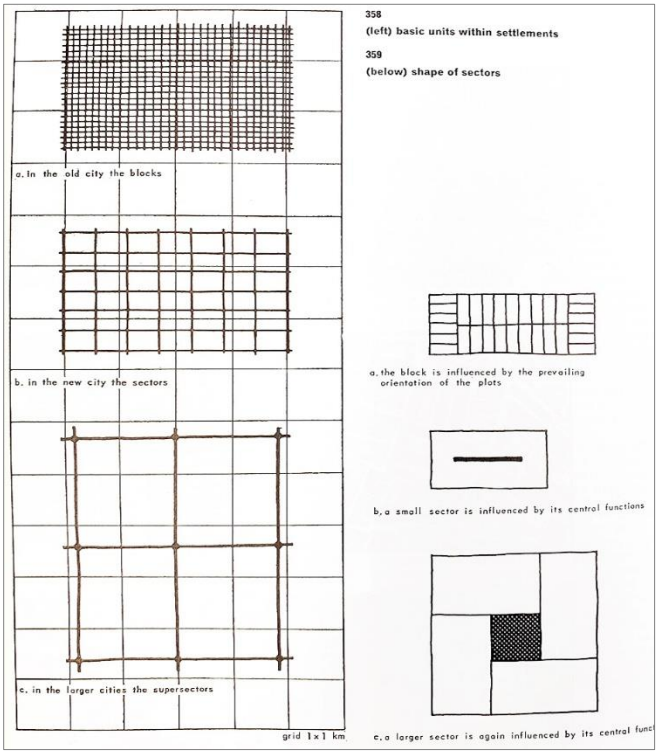

Fig. 3-17: Theoretical conception of sectors and units. Source: *Ekistics* (Doxiadis 1968).

In practice this meant that the larger scales would be structured according to the previously discussed road system, whose aim was to achieve maximum speed and circulatory capacity. But this system would connect to smaller, more static cells contained within superblocks, which Doxiadis imagined as equivalent to traditional neighborhood units. Thus Doxiadis believed that even in massive urban agglomerations, "we can keep the human community as the basic cell of

the urban settlements to be created in the future" (Doxiadis 1968). Inside those cells the human scale would predominate, as most car circulation would be limited to the perimeter and all required services would be completely accessible by foot. "Someday, if people should bring their cars into the human part of such a community, we will laugh at them, as we do now at people who have entered a drawing room wearing their muddy boots" (Doxiadis 1966).

To achieve this vision, Doxiadis's theory of ekistics defined eight levels of city form, each with its own internal focus. At each level a grouping of approximately four community units would provide the basis for the construction of a community unit at the next. The smallest community (Class I) comprised from 15 to 20 families and represented a typical group of dwellings on either side of a residential street. Class II represented a combination of these units into a slightly larger formation of 60 to 100 families with access to a larger pedestrian-oriented road leading to a number of small-scale community facilities such as a small public park for children. At this scale, vehicles would be allowed access to residences by means of a perimeter system of cul-de-sacs. The next largest community, Class III, serving 300 to 400 families, would be structured around a larger pedestrian road leading to a number of larger community facilities, including a primary school. One might think of this as the classic neighborhood unit proposed in the U.S. in the 1920s by Clarence Stein (Mumford 1961). The next largest level community (Class IV) would then incorporate all the commercial and institutional facilities needed to satisfy the everyday needs of 1,200 to 2,000 families (approximately 6,000 to 10,000 people) — essentially a village. A community of this size would still largely be organized around pedestrian circulation routes, but a road for vehicles would also cross it to provide access its central area.

At community Class V, the theory of ekistics reached what it referred to as the "modulus" of development (a word it appeared to borrow for planning from Le Corbusier's architectural idea of the "modulor," representing the basic dimensions of the human body). At a population of 30,000 to 60,000, representing some 6,000 to 12,000 families, this provided the fundamental building block of future cities. Its importance was that it could be contained within a superblock formed by peripheral high-speed arterial roads. Composed of three to ten community Class IVs, the modulus would contain all the resources of a small self-contained city. Yet because no dwelling within it would be more than 2 km distant from any other place within it, those living there would have access all its resources largely without having to use private vehicles. Walking, bicycling, and the use of shared transit options would be encouraged instead by means of an integrated system of pedestrian paths through landscaped common areas. Meanwhile, larger public-serving facilities such as sports fields, workplaces, areas for small manufacturing and service businesses, and larger cultural institutions would be arranged at its perimeter to buffer it from outside encroachment. When fully built out, the modulus might thus achieve a certain resistance to change, providing a quiet, largely static unit of urban form reminiscent of a traditional city.

It was according to (and because of) this scaled hierarchy of internally logical components, culminating in the replication of relatively self-sufficient modulus units, that Doxiadis believed the city could create a framework for maximum liberty. "It is within such static cells that we can save man from the city that will crush him; it is within them that the community can have complete freedom for its expressions, and man for his life." (Doxiadis 1975).

G. The Dynapolis

Other than balancing the need for small-scale settlement areas that allowed for the development of protected social interaction with the potential for wider access provided by the motor vehicle, Doxiadis's views differed widely from those of earlier modernists in one other key respect: he criticized the static nature of their utopias. The modernist teleology typically imagined the ideal city as an entity that would become fully realized at a specific future date. Their programs thus proposed mega-developments that would essentially be complete when they crystallized a desired formal image. The unfortunate form these took in the U.S. were housing blocks built as part of urban renewal campaigns in the 1940s, 50s, and 60s to replace the tangled matrix of pre-World War II low- and moderate-income neighborhoods. They were also used extensively in rebuilding projects in postwar Europe and in cities of the global South facing massive rural-to-urban migration.

In Doxiadis's mind, the static quality of such projects was modernism's Achilles heel, and he argued that their appearance was largely a result of early modernism's failure to appreciate the need for spatial development to be able to change over time. Older urban neighborhoods may thus have lacked formal order, but they could adapt to meet their residents' changing needs. But within the context of the expanding urban future, the designs of older modern planners would all eventually prove disastrous because they would be outgrown. "The most important characteristics of all these [previously failed] cities was that they were static, they did not grow beyond a certain size" Doxiadis claimed. He added that "man, in dreaming of the ideal city, did not conceive of anything larger than what already existed. On the contrary, he was tending always to limit the size, to consider the city as a static cell." Invoking Le Corbusier's work as an example of this modernist failure, Doxiadis explained that the prominent urbanist "accepted the dimensions of the problem but not the dynamic character of cities like Paris." This had catastrophic impacts. While Le Corbusier was thus a mastermind in many respects, because "his plans lack in one of the four dimensions, that of time, they cannot be considered as practical" (Doxiadis 1966).

By contrast, Doxiadis sought to foreground the concept of time. As he maintained, "for the first time in history, settlements are not only three dimensional but four dimensional, since they exist continuously within the fourth dimension of time" (Doxiadis and Papaiōannou 1974). Consequently, his position was that the ideal city might better be considered as engaged in an ongoing process of becoming, employing a set of systems and relationships that might remain valid, regardless of its specific spatial condition at any point in time. Because of the ongoing explosion of urban populations, what was needed was less a detailed blueprint for its future form than an expandable structural frame that would allow it to grow and respond to its residents' needs at ever-larger scales.

A key principle that Doxiadis espoused throughout his career was that for any city to prosper and thrive, its form must be dynamic rather than static. For him, the sites he had studied in Greece presented such a quality; this had been what had allowed them to change over time and engage with their surroundings in a timeless manner. Many other settlements had flourished upon their inception; however, because of their static nature they had declined rapidly when they failed to adapt to changing circumstances. Similarly, it had been a failure to acknowledge the changing nature of urban challenges through time that had caused conditions in older European and American cities to decline in the mid-twentieth century. Those cities may have served the needs of their residents when they were first constructed, but they were now failing because they were unable to adapt to rapid increases in population, the introduction of new modes of transport, and the advent of new building technologies. These changes could thus only bring a drastic decline in

their condition. For instance, the European central city that had been inherited from before World War II had never been designed to allow widespread dependence on motor vehicles.

> *Looking at one aspect of its [old city] structure, at the pressures exercised on its center, we can understand how much they increase because of its growth, and how they finally break the old central tissue which is not able to stand present pressures. How can a child whose heart is enclosed in a steel frame grow to become a man? It will die as the centers of our cities do. (Doxiadis 1966).*

Doxiadis's understanding of the role a master plan should play in a city's development trajectory was thus very different from that of other planners at the time. From his perspective, planners needed to build a dynamic, unsettled quality into their plans to enable a city to grow through the fourth dimension. The dynamic city of the future "will evolve continuously, and when it ceases to do so, the death of the whole organism will occur" (Doxiadis 1966). Ekistics thus proposed that the activity of planning could no longer simply involve the placement and design of different physical elements. Instead, the planner had to create processes and dynamics that would endure and be applicable in different contexts. In short, the planner would have to engage with the fourth dimension of time (Fig. 3-18). A master plan should ideally thus act as an instrument that creates a logic for future growth. That way, a city could move beyond the limitations of the past and adapt to changing circumstances.

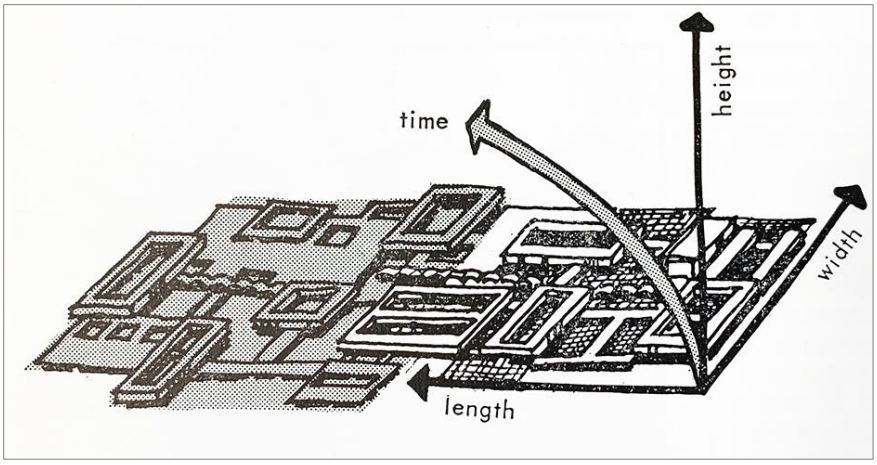

Fig. 3-18: Time as an important fourth dimension in city-building. Source: *Ekistics* (Doxiadis 1968).

Many of these concerns were written explicitly into the laws of ekistics. For example, the seventh law reads that "the development and renewal of human settlements is a continuous process. If it stops, conditions leading to death are created." And the thirteenth law focuses on the role of time in planning. It proposed that "time is a factor necessary for the development of settlements. As such it is inherent in settlements and physically expressed in them" (Doxiadis 1968). Doxiadis also frequently celebrated these principles in his lectures. "We can proceed to a design, but not a design for living; this has to be decided by each one of us," he asserted. "What we need is a design for is a framework which can give people the opportunity for a better and happier life," (Doxiadis 1966). In another instance, he argued that the city is never static nor a finished product, and that

planners should aim to “have an overall dynamic balance, expressed by a continuous attempt to readjust all the elements in order to reestablish the general balance” (Doxiadis 1968).

As a theoretical product of all these ideas and concepts, Doxiadis constructed a universal model for the growth of cities which he labeled the Dynapolis, and which provided the basis for many of the urban plans produced by DA (Fig. 3-19). Doxiadis had initially developed the concept in the late 1950s as a response to the pace of world urbanization and the need for an adaptable system of growth (Bromley, 2002). At the time, the overcrowding of cities and the dangerous congestion in their centers was leading many urbanists to conclude that the old model of centralized growth was no longer practical in the new age. If cities continued to be conceived as having a single center, that center would swiftly become overloaded as traffic was directed toward it, smothering the ability to circulate within it. But where others saw this leading to a need for polycentric or centerless models, Doxiadis’s answer was to propose a city with an expanding, elastic center.

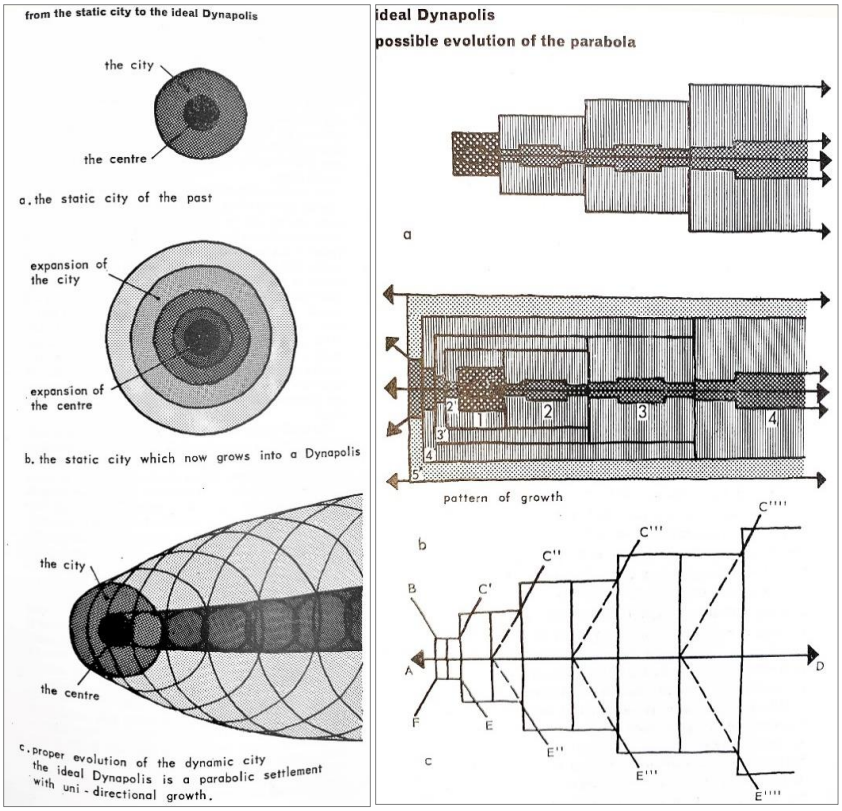

Fig. 3-19: Doxiadis’s Dynapolis. Left: the expanding center. Right: the concept’s evolution and growth. Source: *Ekistics* (Doxiadis 1968).

The key to Doxiadis’s concept lay in the prefix “dyna,” which indicated an “urban settlement which grows continuously” (Doxiadis 1968). But to retain the ordering of its component pieces in relation to each other while preserving the human-scaled quality of its older sections, this growth needed to be channeled to allow its center to continue to grow in a single direction. This expanding center would, in turn, allow development of a transportation/ commercial axis that

would alleviate the pressures caused by the overcentralization of these functions in more traditional cities. Instead of becoming a constrained central destination, the center itself would thus be allowed to grow and develop multiple termini along an axis that would be accessible from different points. In this way the future expansion of the city's business and administrative sectors could occupy a growing urban core that would also provide a main catalyst dictating the direction of all future growth. New residential zones would thus develop naturally along its flanks, defining an overall pattern of territorial expansion that would occur parallel to it. A Dynapolis could grow and develop without bounds or limits of size and scope by offering a framework to adapt to the changing demands and needs through different times. Without any internal limit on ultimate population growth, the model would also allow cities to be truly timeless. "We have moved from the era of the static city into that of Dynapolis," Doxiadis asserted (Doxiadis and Papaiōannou 1974). And to Doxiadis's way of thinking such a frame for urban development could just as effortlessly shrink in size as it could expand.

For fifteen years prior to receiving the commission for Riyadh, DA had been applying the idea of the Dynapolis to various cities in both the developed and developing world. One of the first of these, and one that was in many ways most relevant to the firm's later work in Riyadh, was Baghdad. DA had initially been hired to produce a national housing plan for the new nation of Iraq, and the success it had in this area eventually led to a commission to redesign Iraq's historic capital as an efficient, modern city. The Baghdad contract allowed Doxiadis to work out many of his ideas about the relation between the different community classes and the sizing and location of the system of roads, streets, and alleys providing access to them. However, its extreme formal clarity was typical of modern planning generally and thus did not reflect the more nuanced quality of the local architecture (Pyla 2008). It has today also been allowed to deteriorate to the point where it is nearly unrecognizable.

As DA approached its work in Baghdad, it decided its most important task was to create a framework for urban expansion that would preserve the central, historical areas of the city while allowing for its efficient expansion to accommodate a burgeoning population which it was estimated might ultimately reach 3 million (Theodosis, 2016). After considerable study of existing conditions, the plan proposed that the northwest–southeast orientation of the Tigris River offered the most logical axis for an unbounded new pattern of linear growth. Once this orientation was established, the central commercial and institutional areas of the city were imagined as expanding in both directions from their historic riverside location. Vast new areas of housing, each with their own commercial and institutional centers, were then laid out on either side of this expanding core in a generally rectangular pattern divided by a series of new and improved high-speed roads. These new residential areas were based on an early conception of the modulus, which corresponded to a community Class IV, housing an estimated 7,000 to 10,000 people. However, in keeping with the early development of the Dynapolis concept, a large area of West Baghdad was imagined as a new community Class V, housing a potential future population of up to 100,000 people. These new areas of housing were fitted out with much-needed infrastructure for electricity, drinking water, and sewerage, and several model development areas were built. New areas for industry were pushed to the perimeter where they would not conflict with the pattern of new, nested areas of internally focused residential development.

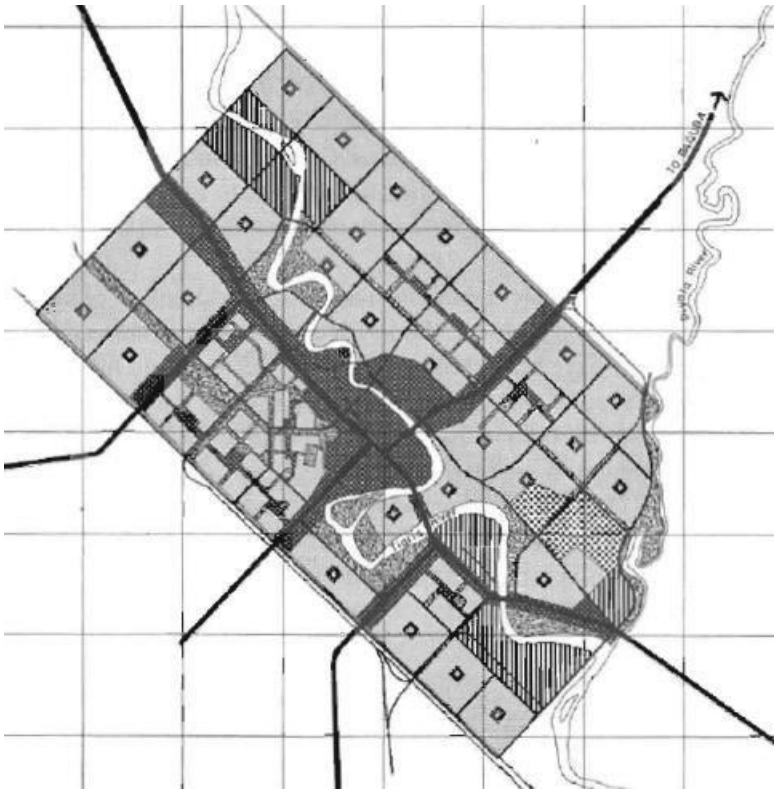

Fig. 3-20: Doxiadis's plan for Baghdad. Source: (Pyla 2008).

For the next ten years, DA continued to apply what it considered to be an ever-improving version of the Dynapolis model to other contexts. These included the city of Tema in the new nation of Ghana; the capital of Saigon in war-torn South Vietnam; and the troubled industrial center, Detroit, in the U.S. But its most well-known realization may have been in planning for the new capital of Pakistan, Islamabad, in 1959–1960.

Like the work in Baghdad, the planning of Islamabad was relevant to the work in Riyadh because it, too, was intended to establish the image of a modern new capital city. Islamabad was also being created next door to the historic settlement of Rawalpindi. To establish Islamabad as a center for the national administration and maintain the identity of Rawalpindi as an older manufacturing and commercial center, the DA plan imagined two axes of development emerging side by side. As the double city then expanded over time to the southwest in a conceptually parabolic pattern, the plan imagined the eventual development of 84, 2 km x 2 km community Class Vs, with each such modulus unit accommodating 20,000 to 40,000 people and containing its own central shopping, business, and civic area sized to the needs of its inhabitants. Each of the Class V communities was in turn composed of four Class IV communities, divided from each other by main roads leading to the central commercial area (Mohr, 2010). Each of the Class IV communities was then further divided into smaller units and provided with a comprehensive system of pedestrian circulation. At a larger scale, each Class V development area was separated from every other by a grid of high-speed roads that allowed residents to circulate freely throughout the entire urban area.

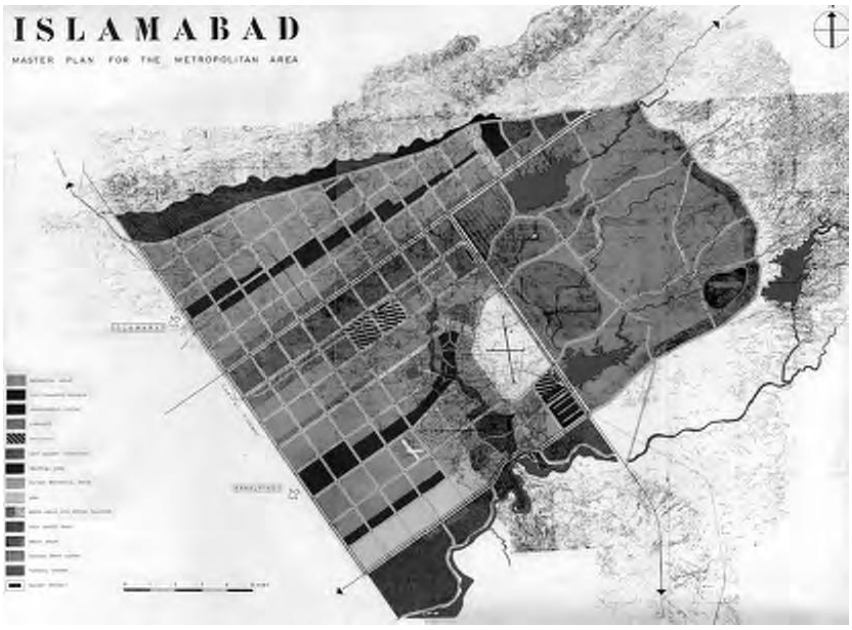

Fig. 3-21: Doxiadis's plan for Islamabad. Source: (Mohr 2010).

H. Conclusion

As this chapter has sought to show, Doxiadis's approach to the plan for Riyadh can only be understood when contextualized within the larger debates surrounding the future of the twentieth-century city and the strategies then popular within urban planning. Moreover, Doxiadis's position within this larger discourse had been influenced by his early education and work experiences. Thus, not only did Doxiadis address contexts where the clients had built-in preferences for certain urban strategies and solutions, as described in the last chapter, but he also brought with him deeply held ideas and concepts of his own, which he had been developing for two decades. The plan for Riyadh was thus not only grounded in a local context but also emerged in response to disciplinary dynamics occurring elsewhere in the world, as this chapter sought to illustrate.

This chapter has also presented Doxiadis as a man of many contradictions, one who sought to balance positions that sometimes seemed in direct contradiction with each other. Many of these derived from the fact that he had a clear fascination with the legacy of CIAM and modernism in general; however, he was aware of the shortcomings and weaknesses of early modernist projects. Likewise, he was acutely conscious of new, critical views that had developed in response to these projects and the practical limitations of embracing them in his own professional work. As a result, his projects were often the product of a negotiation between two contradicting forces — support for many of the ideals and convictions of modernism that he admired, yet a need to repackage them or develop them further to move beyond their apparent limitations and so regain the public's trust. He thus saw himself as a new breed of modernist, one who could bridge contradictions, combining in his proposals the art of design and the abstraction of science, grounding attractive theories with practical practice. To that end, he created what he termed the science of ekistics as a new framework to guide his projects. As a rational tool for urban development in general, it would

provide a perfect balance, combining the inputs of many different fields to produce the ultimate model for cities of the future.

Doxiadis's exposure to the dreadful conditions of life in postwar urban areas had created a strong foundation for many of his later convictions. Having witnessed firsthand the destruction of two world wars and the unlivable conditions in many cities in the late 1940s and early 50s, he became convinced that the radical dreams of modernists, while ambitious and theoretically stimulating, lacked the pragmatism needed to lift urban populations out of their current predicament. On the other hand, he saw many of the small-scale interventions proposed by politicians as inadequate to meet the challenges of the coming global urban future. Thus, he found it necessary to embrace a number of contradictions. What the world needed was a practical dreamer, he believed, and he conceived of himself as just such an individual: someone able to dream and theorize but also capable of implementing those dreams and making the required changes. This was why he could argue fiercely in defense of cities as a concept, advocating for them against popular cries to abandon them for new forms of living while simultaneously criticizing their current limitations and calling for a fundamentally new approach to urban forms.

As I have also described here, another fundamental contradiction involved his belief in the need for extreme order in the structuring of physical space while also advocating for complete freedom of human thought and action. While counterintuitive, he often argued that these two positions were not mutually exclusive. Indeed, he saw them as complementary: the only way people could be truly free was within a carefully designed system that was able to provide for such freedom. And to achieve this balance, he embraced another difficult contradiction: a desire to promote both the human scale of traditional settlement and the new potential for mobility afforded by private automobiles. Doxiadis firmly believed in the value and importance of vehicles, yet at the same time, he advocated strongly for human values and their continued importance in the modern city.

Perhaps the most significant concern Doxiadis had with postwar modernist designs (and existing cities in general), however, was that they were too static and that they were thus unable to account for development, expansion, and change over time. To address this, one of his most significant concepts was the idea of the Dynapolis, a city that could grow like a living creature, expanding with time as demands changed. Along these lines, he was convinced that most modernist architects were wrong to position themselves as planners: an expert planner would never deliver such a limited product as an ideal, formal, unchangeable plan. Rather, the role of the expert was to develop a system, a framework, and a mechanism in which a city could continue to grow, regardless of its eventual shape or size. This was perhaps one of the most influential principles that guided him through his career, and it was a significant feature of his work in Riyadh — as it had been in his projects in Islamabad, Baghdad, and many other places.

What this chapter has tried to show is that Doxiadis's background, experiences, and the status of cities and the profession of urban planning were all significant inputs to his work in Riyadh. Doxiadis did not arrive in Riyadh without preconceived ideas about the conditions he would find there and how he would address them. Thus, the entirety of this background, experience, and understanding of planning culture had shaped his convictions and ideals, which in turn helped shape the 1972 project in Riyadh. Together with Chapter 2, this chapter has sought to provide a proper foundation for exploring the specifics of the plan, unpacking its many layers, and understanding its sophistication and enduring impact on the city. It is to this project that I will turn

in the next two chapters. In the next chapter, specifically, I will provide a detailed examination of the plan for Riyadh as it reflected the factors discussed above.

Chapter 4: Riyadh Master Plan

A. Introduction

As the last chapter attempted to show, for more than fifteen years, Doxiadis had been attempting to develop a rational, systems-based approach to city design based on a new science of human settlements called ekistics. In keeping with his attempts to revive the expert authority and prestige of modernism in planning and architecture, ekistics proposed a comprehensive approach to the design of human settlements. A key feature of this approach, as applied in the work of his planning firm, was a model for a future city conceived as the Dynapolis. As developed in his theoretical writings and the annual Delos Symposia, this offered a flexible solution to the problem of planetary urban growth, one that could be applied anywhere and that was expandable to almost any scale.

DA began their work on Riyadh in the winter of 1968. The final plan was submitted to the Town Planning Office of the Ministry of the Interior for Municipalities in 1971. It was then officially adopted by the Saudi Arabian Council of Ministers in 1972. The contract provided for the formulation of a master plan and a program of implementation intended to guide development of the city through the year 2000. In its final form, the plan included a proposal for the design of the future city including the directions in which it could best expand; a plan for the layout of new circulatory infrastructure (principally roads) and the development of public utility infrastructure; the layout and prototypical design of new residential districts for different areas of the city; proposals for the type of open spaces and community facilities it should include; the location of large industrial, institutional, and governmental uses; the integration of new development with and the preservation of existing areas of the historic city; and a study for the siting of a new airport and sports complex (Al-Hathloul 2017).[36]

As mentioned in the last chapter, one of the principal reasons DA had been selected for the work on Riyadh was Doxiadis's emphasis on a rigorous scientific method of planning, and this ideal and attitude would be prominent in the way his firm approached its task. Doxiadis believed this approach would obviate the critique of early modernists – that their products were too artistically derived and therefore inadequate to the multidimensional task of planning the late-twentieth-century city. Through its focus on data gathering, neutral analysis, and the application of the principles of ekistics, work by DA was also perceived as guaranteeing an outcome that could be considered nearly inevitable, due to the application of rational processes of analysis.

At the time DA was awarded the commission for the Riyadh master plan, Doxiadis himself was also finalizing the principles of ekistics (which he had been developing for more than two decades) in the form of a book titled *Ekistics: An Introduction to the Science of Human Settlements* (1968). Moreover, DA had become well known, through projects such as those for Baghdad and Islamabad, for its application of the idea of the Dynapolis to large-scale urban plans. Indeed, following his belief that theory should be modified to reflect the evidence of practice, many of the parameters of the Dynapolis model had been worked out and refined through these earlier projects. The task in Riyadh was to apply these now relatively established principles of ekistics and the

[36] Although not part of the original contract, the location of a new airport and sports center as well as a study of the old city were added to the contract a month after work began.

Dynapolis to the Saudi capital. Doxiadis also saw the Riyadh commission as an opportunity to further develop a model to guide the eventual urban future of the entire planet.

Because of its timing and the nature of the site, the plan for Riyadh offered possibly the most perfect opportunity yet for a complete realization of the Dynapolis model. The area around the existing city was largely undeveloped desert and farmland with few natural or historic social constraints. The recent development of the oil sector of the Saudi economy also meant that the client, the Saudi state, had access to great financial resources to carry it out. The Saudi government likewise operated according to a largely centralized system of decision-making and was interested in using the project to promote a new image of the country as a modern developed nation, both to an international audience and as an affirmation of its ruling mandate. Meanwhile, DA had grown since its earlier work in Baghdad and Islamabad both in terms of staffing and reputation, and was now one of the preeminent urban planning offices in the world. Its universalist approach to city design had also not yet been cast into question by the development of situated postmodernist discourses. By 1968, therefore, most of the tools and processes for producing the Dynapolis had been developed and tested in other cities, and the firm was in a nearly perfect position to apply them in Riyadh. After detailed examination of the context of Riyadh — the local landforms, climate, population, and history of settlement — it would just be a matter of applying a standard Doxiadis approach to the redesign of this rapidly growing city in the center of the Arabian Peninsula.

As this chapter will attempt to show, the Riyadh plan must therefore be understood as a creature of its particular historic moment — both in terms of the high regard in which universal design approaches were still held (at least in the developing world) and the trust the Saudi government had in Doxiadis on account of his reputation and method. The expectation was that the effort to produce a comprehensive plan for Riyadh would create a modern image symbolic of the entire nation. As was indicated in Chapter 2, it was also a characteristic feature of this historic moment that this image had largely been determined in response to the Orientalist precepts introduced to the country since the 1930s by the settlement practices of Aramco.

B. The Groundwork

In the numerous urban plans that DA had worked on in varying contexts and at varying scales, the first step had always been to devote long periods of time to rigorously collecting data about the existing conditions of a project site. In part, this was intended to guard against an outcome in which proposals for government action would impose abstractions over actual context. “Every projection must be properly connected with what is actually happening today,” Doxiadis later claimed, “so that we do not produce abstract possibilities, but ideas that can actually help us in a practical way” (Doxiadis and Papaiōannou 1974). Emphasis on research would also allow DA to move beyond the limitations of early modernist work, which was typically premised on the application of abstract theories. Doxiadis’s position was, however, that he had his feet on the ground, he was practical, and although his theories were ambitious, their application would be guided by thorough initial research in the field. This approach was also consistent with Doxiadis’s view of planning as an expert, technical enterprise. Framing the activity as a science implied a substantial shift in the role of a planner, who could no longer rely on being viewed as a creative prodigy who would

produce solutions without recourse to clearly articulated methods. Rather, the planner would now occupy the role of a scientist who first gathered all necessary facts and statistics, and who then applied neutral algorithms, formulas, and predetermined tools to them to arrive at optimal solutions. In reality, a proposal becomes neutral only if it is able to consider all relevant variables, which is almost never the case. Nevertheless, following this approach, Doxiadis believed the activity of planning could regain its authoritative standing by producing outcomes that were all but inevitable in light of the available information.

As Doxiadis described the ideal involvement of planners: "When we reach the point of knowing and understanding the settlements and guiding them through proper policies and programs for their future development, we are confident that we can finalize our opinions about the physical plans" (Doxiadis 1968). Noteworthy here is that to "know" and to "understand" preceded the formulation of programs and policies. The first step with regard to any planning project was thus an initial, extensive stage of data collection, and the DA approach to Riyadh was to "know" and "understand" it before anything else. This effort had the additional benefit of helping to legitimize the activities of DA in the eyes of its clients.

DA and the Town Planning Office in the Saudi Ministry of Interior officially signed the contract for the master plan work on December 27, 1967. It took DA less than a week to then open a local office in the Al Malaz neighborhood and start their work. The sole subsequent role of that office was to gather and collect as much information on the conditions of the city as possible, with the analysis of these conditions and development of the plan itself occurring at DA's Athens headquarters. This initial phase of DA's engagement culminated seven months later in the first document produced by DA, titled "Riyadh, the Existing Conditions" (Doxiadis Associates 1968a). This 380-page report, which the DA team submitted to Saudi officials on July 21, 1968, was significant because it contained a wealth of data gathered from a variety of sources. And, although none of the members of the DA team was a Saudi national, those who had worked on it were all touted as experts in such fields as planning, architecture, traffic and civil engineering, economics, and computer science.

The topics included in the report varied widely, but the idea behind it was that it would give a holistic picture and full understanding of Riyadh's contemporary operationality and institutional functions as a guide for its future trajectory. The DA team began by conducting visual surveys, collecting maps and existing government reports. They also met with a great number of officials in the Town Planning Ministry, the Riyadh municipality, and other government ministries. They met with consultants responsible for separate, ongoing studies of water, sewer, and other utility infrastructure development. Other areas of research included sourcing plans for the development of new industries in the city, plans for the new airport, work by the architect Kenzo Tange on the athletic center, and a national government plan to build 7,000 subsidized housing units for people of moderate and low incomes (Middleton 2009, p.88). In general, however, the DA team relied on five main sources to produce its initial report: an extensive household survey completed by May 1968; specialized transportation studies led by experts in June 1968; on-the-ground observations; data gathered from various governmental sources; and an existing block-by-block building survey that the Town Planning Office had conducted in 1965 and 1966.

The first section of the report explored the population of Riyadh, deliberating on issues such as the demographic mix of the city and its residents' cultural and social characteristics. It estimated that the city's population was nearing 300,000 residents, most of whom were young men. It thus identified how there had been a twelve-fold growth in the population over the last

forty years, and that there had been a yearly growth rate as high as 10 percent in the years prior the initiation of the planning effort. With a natural yearly increase in the population due to birth averaging as low as 2 percent, the team concluded that most of the recent population surge had occurred as a result of migration. Indeed, it estimated that migration might represent as much as 50 percent of the city's current population. The report further noted that the problem of future growth was difficult to pin down because of the effect of shifting the nation's capital to the city in the 1950s and the more recent surge in prosperity due to the rapid development of the petroleum industry. But it estimated that the current population growth rate was 8 percent per year, which, if maintained, indicated the population of the city in 2000 would be between 1.8 and 2 million.

Territorially, the report found that the city's current radial pattern of expansion had largely taken a disorderly form, driven by private real estate speculation and the existence of a number of key road corridors. Otherwise, the direction of urban expansion had been guided mostly by natural elements (valleys, water bodies, and agricultural land) in addition to the effects of climate. The location of large institutional functions and manmade elements (the airport, governmental institutions, and royal palaces) were considered to be a secondary but significant source for current growth trends.

The Riyadh transportation network was judged relatively favorably as "more balanced than other towns." But the report found that it still needed massive upgrades to meet future demands, especially since the current pattern of streets lacked a significant hierarchy to separate high-speed from local traffic. There were also no major traffic arteries in the central area, resulting in severe problems of congestion. The roads analysis also noted that the location and development of thoroughfares frequently did not match the current development of actual traffic patterns.

The document then studied the current commercial and business district, located in the heart of the old city, and sought to evaluate its historical architectural features. This included an analysis of the general urban fabric, including the city's existing housing stock. This was found to not be in the best of conditions. Indeed, the report identified deteriorated housing in older areas of the city as one of the main challenges to be faced in the coming years.

The report also described other components of the city such as its commercial and industrial institutions, public buildings, recreational and green areas, religious buildings, cemeteries, health and social facilities, and infrastructure networks. In terms of the city's economy, the document found that Riyadh had outperformed the rest of the country by a staggering 126 percent between 1950 and 1968. This had led, however, to a high rate of growth in vehicle traffic in the central business district, the nearby districts of Murabaa and Shamsiyah, new industrial areas, and the area around the national government ministries.

Fig. 4-1: From the Household Survey. Left: estimated vs. actual segment size. Right: study area subdivisions. Source: Doxiadis Associates (1968b) Constantinos A. Doxiadis Archives DOX-SAU-A2.

In keeping with the view in ekistics that planning should be practiced at the center of a range of other disciplines, one of the most significant components of the report — and perhaps of the team's whole work until then — was a household survey (Fig. 4-1). The survey set out to gather information on four key characteristics of Riyadh's population: their social and demographic composition, their economic situation, the conditions of their housing, and their access to transportation. According to the DA method such work was essential to establish the parameters of new community formation, including the nature and location of shared cultural, commercial, educational, and religious facilities.

In its effort to produce the community survey the DA team received the complete support of the Saudi government. Indeed, before the team kicked off their work on March 23, 1968, the government engaged in a weeklong campaign on television and radio to educate the city's residents about what to expect. An important part of this message was to reinforce the idea that the DA work would help usher Saudis toward being a "developed" nation. Thus one aired transcript read: "The purpose of this home interview or survey is to collect information relevant to the structure and growth of the city of Riyadh and of the needs and interests of its citizens, in order to enable the government and its consultants to prepare a better master plan for the city, worthy of its role as a capital and its increasing economic and cultural activities, similar to what other major capitals are doing in the developed world" (Doxiadis Associates 1969a).

Traditionally, Riyadh had until then been divided into eight different sections. The DA team, however, increased this number to ten for "scientific validity," arguing that disparities between sections were too large, and that there was a need to break two of the large sections in half. The team's efforts in surveying residents of each of these districts were then aided by a team of thirty trained and well-equipped interviewers from an existing statistics department in the finance ministry. These government employees helped break down barriers of language and culture that the Greek members of the DA team would have had difficulty overcoming without their help.

By the end of May the surveying work was complete. A team of 45 individuals working over the course of ten weeks had conducted 2,571 surveys, from a total estimated number of 12,808

households in the city — a sample size estimated to represent 5 percent of Riyadh's population. It is worth noting that records from the work show that the team was conscious of the problem of unbalanced sampling, and aimed to rectify it. In particular, efforts were made to engage with migrants to the city and with women, with the former being more fruitful than the latter. The team had relatively good success engaging with recent migrants, especially non-Arabs who lived in the center of the city. But they were not as successful in reaching female residents of Riyadh, likely due to social and religious considerations. Furthermore, no account of this failure was reflected in the final findings of the survey. This survey was a large project in its own right, and most of DA's efforts during the first year in Riyadh were dedicated to its successful completion. This was reflected in the scope of the work it represented, the volume of data generated, and the amount of correspondence relating to it that was exchanged between the Athens and Riyadh offices.

From another perspective, however, the initial conditions report was notable for what it did not contain. Although it embodied an extensive and thorough compilation of information and statistics about the form and condition of the present city and the lives of the local population, it made no attempt to analyze this information or predict what it might mean for the future. Nevertheless, it would continue to be touted by the DA team (in a typical Doxiadis manner) as the most important part of the project. As such it would become a critical component of almost all future documents and plans the team produced. Indeed, the information it contained justified almost all future design and policy proposals. It thus provided a foundation on which the rest of the project was built. In the DA team's own words, it would be "the base on which the team will build and propose their plans and visions for what Riyadh ought to be in the year 2000." (Doxiadis Associates 1968).

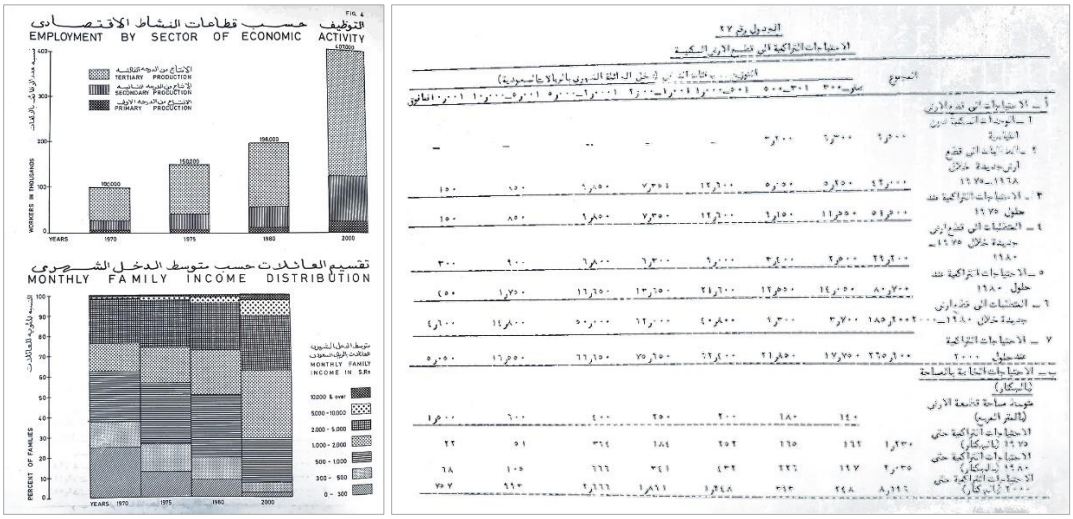

Fig. 4-2: Data Dependency. Excerpts from the existing conditions report. Source: Doxiadis Associates (1968b) Constantinos A. Doxiadis Archives DOX-SAU-A2.

In the three years of work on the plan that followed, the team would maintain this same stance of extreme data dependency (Fig. 4-2). As a reflection of Doxiadis's belief that the accumulation of data was the basis for scientific planning, this perspective envisioned that the form Riyadh might be expected to take by the year 2000 would be the rational outcome of the application

of algorithms, formulas, and rigorous analysis to the information collected in the existing conditions report. This approach would be nowhere more evident than in the final master plan report itself (Doxiadis Associates 1971). When this was submitted to the Saudi authorities in 1971, it was a relatively short document compared to the existing conditions report. And it was not until page 125 of this final 172-page document that a physical vision was proposed for the future city. Even the critical mass of the final report was primarily targeted toward highlighting the significance of key aspects of the data gathered and emphasizing the analysis of it in the form of numbers, graphs, and formulas. The discussion of a "master plan" was only presented in a 30-page section, the sixth section of the final report. Thus, Doxiadis sought to set himself apart from earlier modernist planners. In pursuit of an entirely scientific outcome, his role as planner was to collect all relevant information about a context and then apply formulas derived from his general research on efficient city functioning, so that the "plan" that emerged would seem inevitable.

C. Unity and Order

Despite the claim that the outcome of the work by DA would be entirely objective — scientifically derived truth rather than subjective proposal — the process of compiling information, analyzing it, and producing a set of proposals for the city was nevertheless guided by certain underling value judgments. The most important of these, as discussed earlier, was Doxiadis's modernist view that the planner's job was to create the necessary conditions of physical, cultural, and economic order to allow the maximization of human life. As discussed in the last chapter, Doxiadis had first come to this view in his explorations of the settlements of the ancient Greeks. The framing of ekistics and the model form of the Dynapolis were his attempt to create solutions that might allow this same perceived level of urban civilization to prevail in a modern age in which the demands for mobility were destroying the fabric of traditional urban neighborhoods that had long supported community social life.

When Doxiadis's colleagues arrived in Riyadh and started examining its existing conditions, their first conclusion was thus that the city's existing fabric (both traditional and contemporary) lacked adequate order and logic. For it to evolve over the next thirty years into a humane and efficient setting for urban life, it was therefore essential that a framework be created to organize its growth. As their final report would put it, "the city grew in a haphazard manner that was not orderly nor organized," and that "despite the many efforts that were done individually by few governmental agencies, the city today is not one with an orderly entity and functions." The preeminent goal of the DA project was to address this issue. As the report went on to explain, the scope of their work was to "direct and control growth, to create an organized and orderly city" (Doxiadis Associates 1971). All the elements of the final plan, such as its grid of major streets, extensive road network, and logic of plot parcelization, would eventually be motivated by a search for order and regularity.

Doxiadis also believed that a planner's role should not be to generate and cause growth, but to direct and organize it as it happened. Based on contemporary trends in human civilization, urban growth would occur inexorably, regardless of the planner's involvement. What the planner could bring to this process was an ability to guide and shape it in a logical fashion to achieve the most suitable outcome. Toward this end, a key premise underlying the science of ekistics was the

ability to self-consciously direct the growth and shape of human settlements. As Doxiadis explained, “The great difference between human settlements and natural organisms is that settlements are the product of both natural and conscious forces, and thus their evolution can be guided.”(Doxiadis 1968). Doxiadis was also convinced that the urban phenomenon was just starting, and that explosive growth would come to cities all over the world regardless of their local characteristics. Furthermore, as larger and larger cities became the norm, it would become increasingly important that rational patterns be imposed on them. “Large sizes for cities and their dynamic growth are already facts,” claimed Doxiadis. “Our task is to organize these great cities of man and give them a structure which will allow them to function properly and serve man” (Doxiadis 1966). A plan’s main role was not to inhibit but to define parameters for growth. If urban growth was a natural outcome of life in the modern age, the planner’s job was to effectively organize it. “Our cities need guidance for their growth instead of the chaotic situation of the present and the stop growth slogans,” he claimed (Doxiadis 1975).

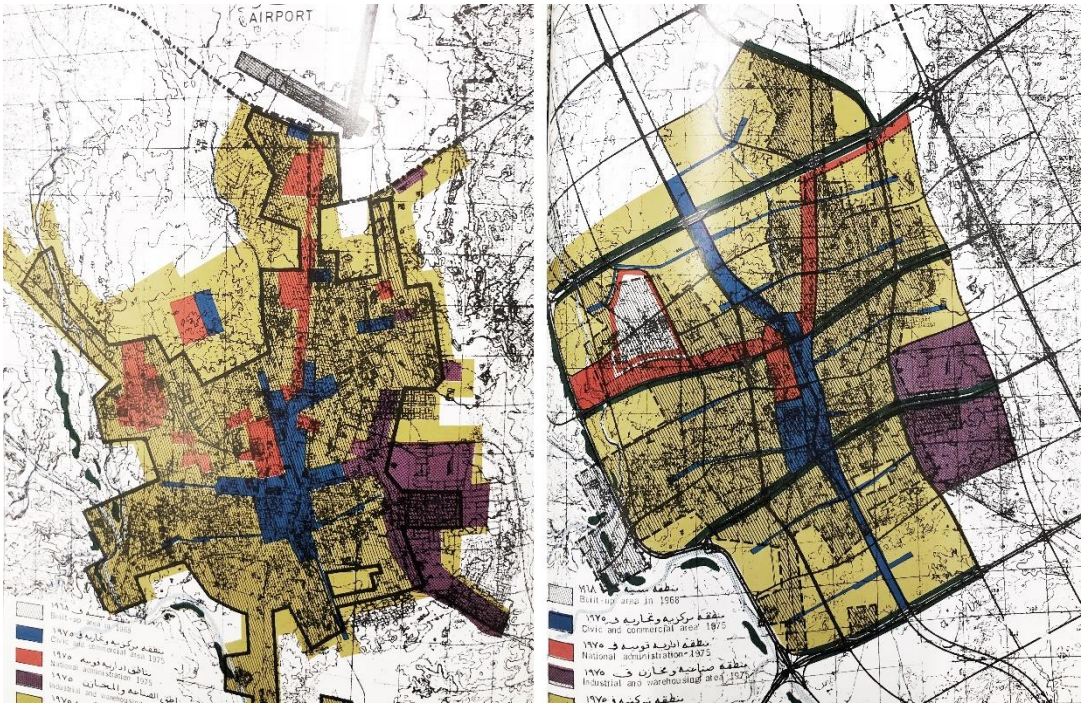

Fig. 4-3: Planner as an organizer. Left: Riyadh’s future without plan. Right: Riyadh’s future with plan. Source: Doxiadis Associates (1971) Constantinos A. Doxiadis Archives DOX-SAU-A18.

In keeping with these concerns, Doxiadis had advertised his services to the Saudi government as an organizer and controller of the development that would inevitably come to Riyadh. For instance, in different meetings and reports explaining what the value of his work would be, he often presented two maps next to each other, showing two alternative scenarios (Fig. 4-3). The first was titled “Riyadh in 1975 without a plan.” It presented a chaotic future for a city with an irregular boundary, an unbalanced mixture of uses, and messy growth occurring in every direction. For comparison, the second map was titled “Riyadh in 1975 with a plan.” Here Riyadh was imagined as a city of extreme order whose future was bright because its boundaries were

regular, because there was a clear direction of growth, and because separate areas were designated for different uses. The contrast between the two oft-used images presented the view that growth was going to happen whether the Saudi government intervened or not, but that timely intervention according to DA proposals could ensure a clear system of order. This understanding was made explicit in the final master plan report, which emphasized how it was necessary for the government "to devise a new framework for growth that is able to connect different types and levels of activities in an organized and orderly manner" (Doxiadis Associates 1971).

The perspective from which this order could best be created was also indicative of Doxiadis's approach. In keeping with his modernist ideals, Doxiadis believed that a master builder should always be able to view and direct growth from the top down, rather than from the ground up. It was only through such a view that a planning team could apprehend and impose the extreme structures needed to correct deficient urban organizational systems. As shown in the image in the previous chapter (Fig. 3-14), in which Doxiadis sits in a movable cage on top of a model of Athens planning the city from above, this vision could be artificially created in a laboratory. But in the case of Riyadh the DA team was also afforded the opportunity to view the city from this vantage in real time and space.

When the Municipality of Riyadh had initially invited six design firms (including those of Kenzo Tange and I.M. Pei) to compete for the master plan contract, they had arranged for all the invitees to participate in private plane surveys of Riyadh. However, this invitation to view the city from the air, to grasp its development and better understand its growth dynamics, was not extended to the additional six invitees added to the list when the Town Planning Office took control of the project. Nevertheless, after DA (which had been in the second group) was awarded the commission, the municipality extended the offer to view Riyadh from the air to Doxiadis and his team as a gesture of good will. The DA team finally took the municipality up on this offer on June 28, 1968, taking a four-hour plane tour of the different parts of the city.

Nobody at that time appreciated how momentous this trip would later become. Those few hours spent flying over the city became one of the most influential tools the DA team would employ in their work. In their later discussions back in Athens they depended heavily on observations made during the course of that flight and the view of the city and its surrounding terrain it provided, often mentioning anecdotes and information gathered from it in the course of generating ideas and analyzing data gathered from other sources. In their internal meetings, and on occasion in meetings with the Saudis, the Greek team often cited the view they got from that flight as a motive behind a specific design or justification for a certain decision. For instance, when deciding the physical boundaries of the city, Doxiadis mentioned how impressed he was with the existing natural boundaries. This was especially true of the Wadi Hanifa (Hanifa valley) which the plan would propose as the main edge to the city's westward growth. He said he did not realize how dominant a feature it was in the landscape until he saw it from above.

Thus, despite all the statistical evidence gathered through the existing conditions report, a major contributor to the final shape of the DA plan was a birds-eye view of the city and its surroundings. This corresponded perfectly with Doxiadis's view that a master builder should be able to impose order and regularity, by planning from above.

D. Major Features

Following their tour of the city by air and their completion of the existing conditions report, the DA team began the process of analyzing what the compiled information implied about how the city might be expected to grow in the future. Where the existing conditions report had provided a picture of the city's origins and contemporary trends — as well as its current geographic, sociocultural, economic, and governmental characteristics — the work now moved to determine how this could best be channeled to produce a new orderly, efficient urban structure. This meant projecting the future organization of such features as the distribution of land uses, the structuring of transportation and utility networks, the layout and design of new residential areas, and the location of social, commercial, and public services.

Within the science of ekistics this first involved quantifying the factors that had already shaped the city and evaluating the kinetic forces they had set in motion. The first step here was to divide these contextual forces into those of a general and specific nature (Middleton 2009). General forces fell into such areas as economics, culture, and politics, and were important because they established the range and character of the city's future needs. By contrast, spatial forces were directly related to settlement patterns, and typically determined the organization of what were referred to in ekistics as "shells" (buildings and other structures) and "networks" (the systems of movement and connection that tied them together). To further abstract these pressures into the realm of detached scientific analysis, the ekistic method then broke these spatial forces into those that were directional in nature and those that were nondirectional. The effect of these forces was then related to measures of texture and density of settlement. Finally, once these various forces had been determined, the ekistic method sought to create a sum-total model that would determine the nature of settlement forces operating across the existing urban terrain as these were serving either to drive or repel growth trends.

The process of modeling, balancing the directional forces of growth with the textural forces governing the grouping of people into neighborhoods, was the essential outcome of ekistic analysis. It allowed DA to claim its evaluation of the future trends was neutral and scientific. It also allowed the DA team to apply the principles of the Dynapolis to the contemporary situation to establish guidelines intended to produce a future orderly, efficient settlement pattern (Fig. 4-4).

Fig. 4-4: A photo from the visit of Saudi officials to DA's Athens team. Seen in this picture, from left to right: Eng. Rassem Shaath, Mr. Saud Linjawi, Dr. Omar Azzam, C. A. Doxiadis, C. Antahopoulos, J. Frantzeskakis. Source: *Doxiadis Associates Review* (1969).

In addition to this quantitative analysis, the examination of existing conditions in the city also identified a number of problem areas. A major concern here involved the need to relieve the concentration of uses in the central business area and the resulting vehicular congestion. In this regard, the transportation survey had highlighted a need to establish a coherent, tiered system of roads and streets in the city center. Citywide, in more general terms, it also cited a need for traffic lights and pavement markings, viable public transport options, and an efficient link between the airport and city.

Other major concerns were revealed through an analysis of the household survey. This pointed to an insufficient housing supply overall, problems related to the density of settlement in older areas of the city, the lack of a system for self-financing housing construction, and a lack of programs to house residents with limited incomes. Additional problems that emerged from the analysis related to aesthetic problems associated with traditional architecture and lifestyles. Many of the residents of older areas of the city were Bedouins who had been resettled there but had little experience with urban life. And although parts of the old city had heritage value, much of it was not suited to modern living.

The analysis further identified an inadequate supply of facilities such as public squares, shopping malls, health services, educational buildings, hotels, and cemeteries. It cited the need for improvement in all the city's utility networks, such those for water supply, sewage, water drainage, electricity, telephones, and waste disposal. And it revealed a current lack of areas for the expansion of industry. Finally, the analysis noted a need for improved management capabilities, including urban governance and planning. Although building and planning regulations did exist in a rudimentary way, based on Egyptian models, they were poorly codified, spottily enforced, and did not cover a complete range of development activities.

Based on the existing conditions report, the DA team next sought to project the extent to which the city and its economy would grow in the years until 2000. This included projected increases in population, per capita income, total income, workforce, and expected hierarchies of employment in such areas as industry, transportation, government services, education, and health care. And based on this evaluation, the team sought to determine the city's expected future needs and priorities in terms of new housing units; commercial areas; administrative, educational, health, religious and cultural facilities; public buildings, squares, and open spaces; industrial areas; and roads.

After identifying the needs of the general population and economic growth trends, the DA team then set out to determine the total land area that would be needed to meet these future demands. Based on a projected moderation of growth trends, the modeling predicted that the city would attain a population of 760,000 by 1985 and 1.4 million by the year 2000. In terms of ekistics, this meant a jump in scale to a Class VII community. Since the present city was equivalent to a Class VI community, this would mean the addition in the next thirty years of four to five largely independent urban modules equivalent in size to the present city — a huge increase.

Based on existing community characteristics and the projected demand for new structures of mobility and for commercial, industrial, institutional and community functions commensurate with the capital city of a rapidly developing nation, the DA team then estimated that an optimal target for the overall net density of the future city would be 60 persons per hectare. Although such

a city could still be described as concentrated compared to suburban growth areas in the U.S. and elsewhere at the time, this figure was still modest by historical standards. By comparison, the overall density of the city of London was 85 persons per hectare; of Tokyo, 152 persons per hectare; and Athens, 170 persons per hectare. As such, it reflected an emphasis in the planning models used by DA both on relatively large minimum lot sizes and greater requirements for vehicle mobility.

At such a net density, the DA team calculated that a total area of 304 km^2 (14 km x 25 km) would be needed for the city by the year 2000. Of this, some 150 km^2 would need to be set aside to accommodate residential growth. They further projected that, as the city grew, the existing airport would come to be surrounded by developed areas on three of its four sides. This created the scenario by which the present airport might be converted to regular urban fabric, with a new site for an expanded airport developed beyond the imagined boundaries of the future city.

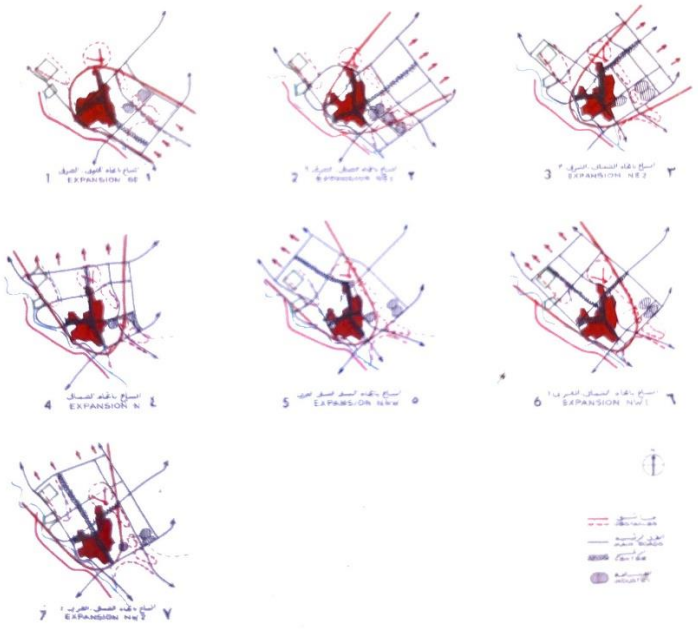

Fig. 4-5: The seven growth alternatives for Riyadh. Source: Constantinos A. Doxiadis Archives.

Given these parameters, seven alternative growth scenarios were developed that attempted to frame the future city within the principles of ekistics and the model of the Dynapolis (Fig. 4-5). These expressed a number of different approaches to the overall structuring of the urban territory according to forces of growth revealed in the initial analysis of the existing conditions work. The options offered a variety of ways to capitalize on the physical conditions of the site: its topography and subsoil conditions; the location of existing roads and major institutional facilities; scenic qualities; economic drivers; and the kinetic pull and push of current patterns of development and mobility. According to the Dynapolis model, each of these options presupposed a principal axis of growth that would allow both the city center and the body of the city around it to grow in an open-ended manner without the need for the continuous, inefficient, and disruptive rebuilding.

Finally, after discussion with Saudi authorities, a preferred model was selected. This focused the main axis of the future city's growth in a northwest direction, paralleling the course of the Wadi Hanifa and other more minor topographic features. In selecting between the options, the method employed by the DA team took into consideration a number of "natural" factors. These included geographic, climatic, and topographical factors as well as historical growth trends. Among these were the local prevailing pattern of hills and valleys, which ran from the northwest to the southeast, and the location of solid soils conducive to building. The chosen alignment also offered a better orientation for avoiding the harshest qualities of low-angle morning and afternoon light. It would minimize exposure to sandstorms while maximizing the potential benefit from cooling breezes. And it reflected the desire of the population and the government to benefit as much as possible from the high lands and green spaces of the Wadi Hanifa. Early on in the history of the city the hot climate had prompted residents to settle in compact and adjacent gatherings along the valleys, and they had used the somewhat higher and more exposed areas located northwest of the city as places for picnics. But the advent of air conditioning now made these higher, more exposed areas more conducive to year-round settlement.

The establishment of the airport and the presence of the seat of government, royal palaces, and administrative buildings north of the old city center were further factors driving the city in a northwesterly direction. And an increase in land prices in the north and northwest already confirmed its appeal for future residential and nonresidential development. The area had further been targeted as the site for a new conference center and a new national university. Meanwhile, current trends signaled little interest in the extension of residential areas to the south. These were therefore identified as the site for future industrial plants, warehouses, and handicraft production. Areas to the south and east were likewise seen as logical areas for the development of housing for people with limited incomes.

While the axis of the DA scheme accommodating the central commercial and urban functions extended generally northwest to southeast of the current city center, the plan also envisioned a number of cross-axial features intended to allow the growth of the city's central functions in a number of subsidiary directions. Most significantly, the plan envisioned an area for national administration that would extend from the royal territory in the west to an area reserved for military buildings in the northeast — and possibly to a new airport. This domain would be used to house ministries and other government agencies. Meanwhile, the city's large green spaces, parks, and amusement areas would be located in the west, including the relocation of the current racetrack and zoo. A new national university site had already been dedicated to the northwest of the city, while industrial and military facilities and a national sports center would be located to the east. The plan also proposed extending a new railway line next to the master plan area toward the market to connect to the current line in the southeast corner of the city. And it proposed two secondary railway lines, one of which would lead to the main railway station and the second to the industrial zone. New areas of land would also be allocated for cemeteries on the perimeter of the master plan area in the east and west. The plan proposed that current cemeteries remain inside the city but that their further expansion be prohibited.

As typical of all DA plans, the overall physical structure of the city would be based on a grid of major transportation corridors, which would form the boundary of largely self-sufficient "modulus" residential districts. According to the growth model of the Dynapolis as applied to the desert environment of Riyadh, this resulted in a system of approximately 2 km x 2 km superblocks. This extreme ordering of the urban territory was deemed essential to guarantee an optimal relation

of macro and micro scales of development. It was not only infinitely expandable, allowing for unlimited future growth, but it created a basis both for maximal mobility and the establishment of the nested hierarchies of settlement and the development of stable local neighborhoods.

Within this overall scheme, the plan proposed guidelines for the organization of development intensity and the location of buildings according to function and architectural type. In general, the distribution of density would follow the principal northwest/southeast axis of growth with a height maximum of eight stories at the center of the city, four stories along the principal commercial streets, and one to two stories in the largely residential areas at the urban perimeter. In addition to larger buildings along the principal commercial streets, three types of typical residential development were proposed: traditional attached structures which made use of the cooling effect of internal courtyards, contemporary attached rowhouses, and areas of mixed attached and modern villa housing. The average area of a residential plot ranged from a minimum of 150 m^2 in the old sections of the city to as much as 1,500 m^2 in more outlying areas.

Since transportation would rely greatly on private vehicles, an entirely new scale of vehicle infrastructure was proposed to facilitate the city's expansion. This built off the main axes of growth beyond the existing city, but it also attempted to blend with existing transportation corridors so as to reduce the cost of land expropriation. The plan's intent was to draw vehicle traffic away from the old city to achieve greater fluidity of movement and to alleviate traffic in the city's central areas and in future residential areas; it proposed surrounding the current city with five limited access highways that would connect to each of the city's four main exits toward Dammam, Al Kharj, Al Hijaz, and Salboukh. The establishment of this highway network avoided not only the need for most vehicles to penetrate the central area but also the overload of existing streets extending north to south out of the old city center.

In addition to such major new transportation infrastructure, the plan provided extensive guidance for the development of the city's future utility infrastructure, including potable water, sewerage, and rainwater drainage. The city's water supply was largely drawn from deep wells, but the present system was inadequate for future needs. Thus, in addition to work to extend the distribution network by building new pumping stations and feeder lines, it called for hydrological surveys of the surrounding area to find new sources of water. The sewerage network for the city would likewise need massive expansion. In 1970 it was sized to serve a population of only about 350,000 inhabitants. According to the master plan, this capacity would need to be increased in three stages corresponding to the years 1975, 1980, and 2000. The plan also noted that there was no stormwater drainage network in the city; instead, drainage of rainwater relied on natural watercourses, the most important of which was the Wadi al-Batha. A preliminary study for a structured system of rainwater drainage was thus also prepared, and its construction was proposed to unfold according to the same three stages of development as that for sewerage.

The city's airport was another major topic addressed in the plan. After the preferred northwest development scenario was chosen, two versions of the resulting plan were developed, reflecting the options to either retain the airport in its present location or move it to a new peripheral location. After consideration of the two options by the DA team and Saudi government representatives, it was agreed that the area occupied by the present airport would be redeveloped after a period of ten to fifteen years. In the meantime, a site for a new airport would be selected and the construction of terminals, runways, and an access corridor begun. After the new airport was put into service the area occupied by the old one would then be designated for residential development.

According to the plan, all this new development would happen in stages. And, critically, the plan proposed that more outlying areas would be developed only as the need for them became clear. In the nearer term, development would concentrate on areas closer to the center. Thus, it was imagined that the successful completion of new neighborhoods here would provide a model for the construction of more outlying areas later. A significant effort would also be made to improve the relationship between the old city and new development areas — an area of the plan referred to as the Action Area.

One of the most immediate goals in the Action Area was to begin the transformation of the city to establish a future, expandable linear form. This meant opening the present central area to expansion to the northeast and southwest to establish the axis of commercial and institutional development central to the notion of the Dynapolis. But the plan's intention in this regard was less to eradicate the old city as it was to adapt it through selective preservation and demolition activities.

Inside the existing town, the team declared they had made a careful study of the urban fabric to minimize required demolition and land expropriations. Despite these intentions, however, significant rearrangements of urban fabric and new road construction was deemed necessary to upgrade the old town's infrastructure and adapt it to automobiles. The goal was to allow older areas of the city to blend with the new 2 km x 2 km grid. But this meant modernizing it by widening certain roads and cutting new roads through it to establishing new territorial divisions that would allow a separation of pedestrian and vehicle circulation.

The goals for the Action Area also called for a reduction of overall population density in the old city, the upgrading of its deteriorated housing stock, and the preservation of important historical structures. The plan imagined the future population of the Action Area to be 200,000 to 300,000 people, roughly equivalent to that of the existing city. But the severe concentration of population in currently underserviced areas of the old city would need to be reduced. The plan proposed spreading this population into surrounding new residential areas that would be developed according to the housing models of ekistics.

Fig. 4-6: Justice Palace winning proposal for reconstruction in 1991. Source: Badran official website.

Importantly, the plan also recognized the symbolic importance of a public space at the center of the city named the Justice Square (Fig. 4-6). However, to preserve its importance within the expanded scale of the future city, it proposed establishing a new orientation and hierarchical ordering of streets in the entire area northwest of the old city. This would also allow the establishment of zoning by use and function here, which would emphasize its importance as a center for national government, with direct transportation corridors extending out to nearby government ministries and a diplomatic quarter. Indeed, the plan called for the entire area between the Wadi Hanifa and the existing airport to be imagined as a government center. This would establish a cross axis of development and a geometrical basis for the further extension of the city during later phases of the plan's implementation.

Finally, to jumpstart the redevelopment effort, before the final plan was even approved, the Doxiadis team proposed ten key actions, with estimated costs, that needed to be approved by the government immediately. Titled "The Ten Important Decisions," the document proposing them was delivered early in DA's assignment and detailed the necessary responses to existing urgent urban challenges that could not wait for the final plan (Doxiadis Associates 1969b). In formulating this document DA was careful to propose actions that would be needed immediately and that would be compatible with any official plan. The most important of these was the construction of 195 km of major new roads and community arterials. But, it also called for the provision of plots for 10,000 families with attendant community facilities; the renovation of 4,000 existing dwelling units in the older parts of the city; the development of 20 ha of land for civic and commercial functions; the development of 125 ha of industrial land; the restoration and rehabilitation of the district of

Diraiya; the development a new Justice Square; the official adoption of the master plan as law; the promulgation of a law allowing for the expropriation and reallocation of private land; and the promulgation of new taxation policies to encourage the development and improvement of land consistent with the plan.

E. Mobility

Emblematic of the ideals of ekistics and the Dynapolis and the focus on an American-derived model of development (the image for much "modern" development worldwide in the 1960s), a major directive of the master plan DA produced for Riyadh was that the city would be, by the year 2000, a city heavily dominated by automobiles. Corresponding to the discussion in Chapter 3, Doxiadis and his team aimed to achieve a difficult balance in the plan between automobile dependency and concern for the human scale and neighborhood form. The master plan report made that intention explicit. It read that "one of the main goals to be achieved for Riyadh to grow in a sustainable and comprehensive way is to build a balanced road network characterized by hierarchical organization and a tight connection with a balanced distribution of functions." This elaborate road network, it added, "will be the long-term framework, within its parameter there will be the organization, coordination, and construction of different projects in the city" (Doxiadis Associates 1971).

Toward this end, the DA team planned the layout of all areas of the city in a way that ensured suitable auto access to all plots. In other words, every single parcel would be adequately accessible by motor vehicle — a condition entirely in opposition to the compact, crowded character of traditional areas of settlement across the Arabian Peninsula. A key component of the master plan was thus a detailed catalogue of different types of roads that would allow this. This taxonomy aimed to relate the amount of traffic each type of road could handle to its function within a hierarchical layout of settlement scales according to the principles of ekistics and the Dynapolis.

A series of preliminary documents based on extensive analysis divided all roads for vehicles in the future Riyadh into five types. Each of these was accompanied by a typical cross-section showing the location of medians, sidewalks, and service and emergency/breakdown lanes. The roads were characterized as follows: high-standard freeways to connect to a larger network for regional travel; highways to allow fast, long-distance trips along high-use corridors within the city; main arterial roads for busy medium and long journeys within different areas of the city; collector roads to connect local neighborhoods to larger road structures and allow for short trips between community facilities; and local streets for access to individual houses and local travel within a neighborhood. This work in Riyadh followed common western practices that were apparent in many western capitals and cities.

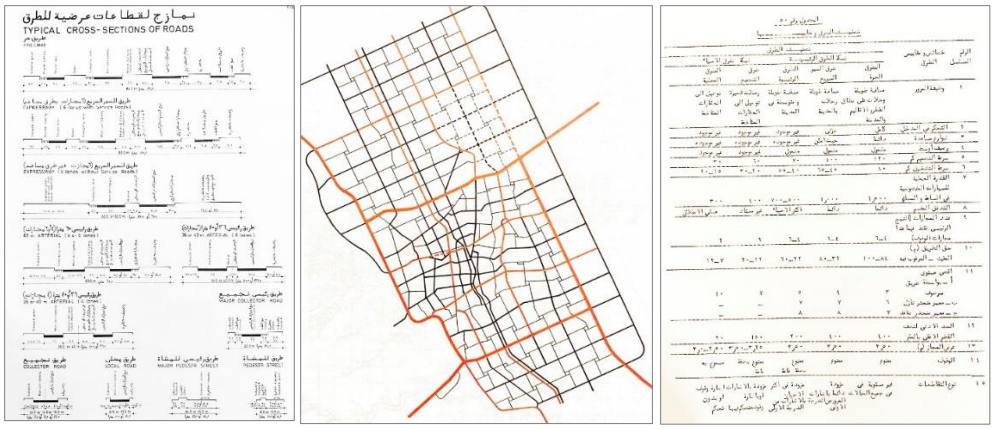

Fig. 4-7: Left: proposed road cross-sections of roads by type. Middle: road network hierarchy. Right: road network catalogue. Source: Doxiadis Associates (1971) Constantinos A. Doxiadis Archives DOX-SAU-A18.

The DA plan intended that this characterization would create a scheme of gradation based on the functions of roads and streets according to the type of movement they were intended to facilitate (Fig. 4-7). This would guarantee a maximum of efficiency, safety, and economy. But, it would also establish a sense of security for pedestrian movement in residential neighborhoods, by separating nonvehicular from vehicular circulation as much as possible. Furthermore, each squared block/community would be supplied with an abundance of external parking spaces along its main thoroughfares. This would facilitate smooth traffic flow and minimize congestion at the city scale. The organic lineaments of the existing city pattern were further intended to connect to the new and highly regular grid through this network, allowing for travel to flow effortlessly between different parts of the city.

For Doxiadis and his firm, this road network was a main element in the plans for Riyadh; other components were secondary in status and had to align and adjust to the logic and requirements of this network. The proposed comprehensive road network would have a total length of 418.8 km by the year 2000, which would allow vehicles to travel the city smoothly using its gridiron pattern. The plan estimated that this balanced distribution of traffic would reduce the average trip length to 6.1 km or 8.6 minutes, and the average operating speed would reach 42.8 km/h. The scheme would also allow residents to access any area of the city from its center in just 20 minutes.

It is important to note that the dominance of the automobile in the Doxiadis plans for the future city was not arrived at through the course of their development. Rather, it was central to the team's thought process from the moment it arrived in Riyadh. And the centrality of the automobile in the final master plan was preceded by a similar emphasis in the many other tasks the team undertook and the reports it produced through the years of their assignment in Riyadh. For example, an extensive traffic survey was carried out as part of the existing conditions report. The traffic survey consisted of information gathered in six different ways: roadside interviews, interview questions, public transportation analysis, traffic flow automatic count, parking spaces calculation, and existing road survey. Through the course of the roadside interviews, the team stopped and questioned the occupants of 7,629 cars, which constituted a representative sample of 1.2 percent of the city's total daily trips. The team also utilized the household survey to record

origin–destination patterns, preferred modes of transportation, the duration of trips, and trip purposes. For the purpose of the traffic flow count, the team additionally set up 89 stations along the main road network and placed local trained individuals to count vehicle flows and estimate the patterns of travel, a process that was conducted during February, March, April, and May of 1968. This attention given to understanding vehicular movements clearly foreshadowed the main role the road network would play in every detail of the final plan. Likewise, it clearly illustrated the fascination with circulation and transportation within DA and Doxiadis's personal belief that private motor vehicles would provide the most significant structuring element in the design of future cities.

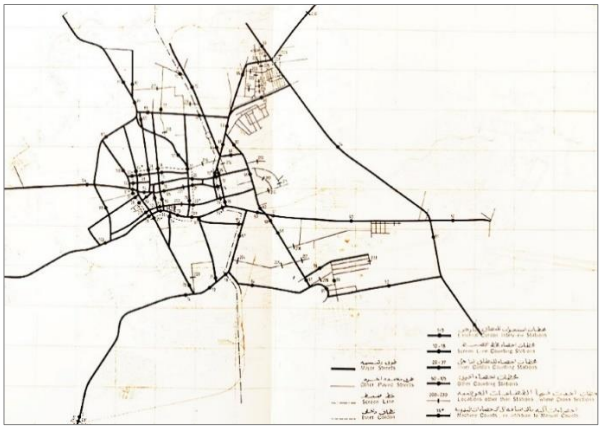

Fig.4-8: Traffic survey count stations. Source: Doxiadis Associates (1968b) Constantinos A. Doxiadis Archives DOX-SAU-A2.

Consideration of automobile circulation was also fundamental to the "The Ten Important Decisions" report that was delivered early in DA's assignment, which detailed the necessary and appropriate responses to urban challenges that could not wait for approval of the final plan (Doxiadis Associates 1969b). As an indication of the DA team's priorities, the first of these concerned the city's road network (Fig. 4-8). It called for the reconfiguration of the existing transportation network and the municipality's road-improvement program, which was already in progress, by presenting a new network and suggesting additions and modifications to present plans. As previously mentioned, this included the immediate construction and improvement of 195 km of major roads and arteries. Among these would be four heavy-traffic, high-speed thoroughfares that would cross it from east to west and north to south, in addition to other smaller arteries and streets for use by local traffic. In effect, this preliminary document proposed an interim transportation structure for Riyadh based on an automobile-oriented pattern that could be constructed by 1975, by which time an official master plan would have been enacted that would provide further guidance on the nature of further urban road building.

It is worth noting that the provision of public transportation was not part of Doxiadis's approach to working out the city's mobility network and requirements. This is puzzling not only because of the trend globally at the time to acknowledge the significance of public transit systems, but also because Doxiadis clearly realized its importance, as quotes from DA documents illustrate (Doxiadis Associates 1968). While the DA team was analyzing the city's transportation network

in its existing conditions report, it had contended there were only three main transportation modes in Riyadh: private vehicles, taxis, and pickup trucks. And it asserted that "the city had no public transport network, hence the movement of buses was limited to government institutions moving their employees and students attending their schools" (Doxiadis Associates 1968). However, in the master plan document, the team introduced the analysis of different urban activity sectors. And in analyzing the transportation sector and its main issues, it pointed out that "given the increase of city's population and the trips its residents make and the lengths they travel, it is now necessary to introduce a public transport system to Riyadh." Furthermore, it noted that whatever structure of roads was proposed, with the new influx of population and increasing demands for mobility, "taxis and private vehicles alone will not address the population's demands in this sector, [and] the authorities must seriously consider building a public transit system" (Doxiadis Associates 1971). These comments clearly indicated that the team recognized the importance of public transport and the necessity for it in the future Riyadh. Yet their final proposal included no mention of a transit system at all. Indeed, that final product focused solely on the automobile and the roads required for efficient transport by private vehicle, and there is no mention at all of how a public transit system might work. Even in the communications between the team and their Saudi counterparts, there was no sign of any discussion or study of a future public transportation system.

Another sign of the built-in bias toward private vehicles came in the form of a report titled "Transportation Systems in Riyadh, Testing Plan Dimensions," which the team published in May 1970 (Doxiadis Associates 1970d). In an effort to evaluate and improve the functionality of the proposals in the final master plan, they set out to employ rigorous scientific and rational modeling to examine and measure the proposed new road network for the future city. A few months prior to this document, the DA team in Riyadh had published a report outlining their preliminary proposal for this vehicle circulation network. The goal of the newer document was to illustrate the scientific procedures they had used to arrive at its design and demonstrate how it represented the most rational, optimal solution. To this end, the document detailed how the team had studied estimates of expected movements of individuals and automobiles, using computer models to assess and evaluate the performance of the future city's transportation system. It thus attempted to scientifically document how the classifications and specifications of the road network it proposed had been arrived at by methodically listing the assumptions made, the methodologies followed, and the findings of the evaluation procedure. In the process, the report attempted to show how a future, modern Riyadh would function according to the orderly principles of ekistics and the Dynapolis model, in a way similar to DA projects elsewhere in the world.

Fig. 4-9: From the report's technical transportation analysis. Source: Doxiadis Associates (1970d) "Transportation System of Riyadh (Testing Plan Dimensions the Year 2000)," DOX-SAU-A11.

In addition the document noted that the series of computer programs used to make this analysis had been specifically developed by DA to study the design of urban transportation systems, and that they provided a huge technological advance in relation to existing planning practices of the time.37 To facilitate this examination, it further noted that the transportation structure of the future city had been divided mathematically into 164 internal and five external traffic zones, and that the internal zones had been grouped into fifteen traffic sectors to facilitate the graphic representation of various conditions. The proposed network of freeways, expressways, major arterials, and minor arterials would thus create a functionally efficient city of the future (Fig. 4-9). It would likewise establish a base for the final master plan — a "long-term framework within which the design of the various specific projects will be carried out and coordinated."

No other component of the plan was as heavily investigated and evaluated, and no other component had a full report dedicated to it, showing the extent to which the team believed in its core importance. Yet, in terms of presentation, and following the methods of DA and ekistics, the ultimate goal from Doxiadis's perspective was to arrive at a solution that would, considering the weight of data gathered in previous stages, stand apart as the only rational conclusion.

F. Neighborhoods

As discussed in Chapter 3, the Dynapolis model that underlay all work by DA was based on creating a delicate (arguably impossible) balance between different scales of human interaction and a set of intertwined relationships between urban physical elements and a heavy dependency on automobiles. The main concept guiding the attention to human scale in a city that is dominated by automobiles, however, was that dynamic, large-scale urban expansion could occur through the agglomeration of relatively stable units at a smaller scale. A city could thus grow as much as required without endangering its enduring structure of neighborhoods.

To understand the workings of this concept in the development of the Riyadh plan, it is useful to recount an interaction that occurred as part of a series of meetings held in Athens between July 31 through August 2, 1969, between the DA team and an official Saudi delegation sent to discuss the progress of the project.38 One of the most important objectives of these meetings was for the Saudis to convey comments, which had originated from within the various ministries and local agencies that would be responsible for implementing the final plan, on a preliminary plan report from DA. Among these was a question from the roads department in the ministry of communication concerning the rationality of an east–west freeway the DA team had proposed as

[37] The July 1969 issue of *Ekistics* had been titled "Computers in the Service of Ekistics." It was dedicated to popularizing the image of ekistics as a scientific endeavor, featuring a series of articles on cutting-edge technologies and computer programs that would aid planners develop a more technical approach to the design of cities.
[38] The Saudi delegation consisted of Abdullah Al Sudairy, the Saudi deputy minister of interior; Omar Azzam, a town planner at the TPO and consultant to the king; Saud Lingawi, acting general supervisor of the town planning office; and Rassem Shaath, Riyadh's municipality engineer.

an extension of the existing Khurais Road. The roads department wanted to know why this new urban freeway was needed when it would divide the future city approximately at its midpoint. As the discussion evolved, those in attendance ultimately came to an agreement that in a city as large as Riyadh would be in 2000, it was "impossible to avoid for certain major thoroughfares to cross the city from one side to the other."

An additional comment from the Greek team, however, emphasized how this high-speed, cross-city vehicle connector would be useful in another way; and their rationale was revealing. They asserted that "the structure conceived by the master plan divides the city into integrated townships each with its own central section and system of circulation and activities." They added that the intention was that these townships/communities/sectors were imagined to be stand-alone entities, free from external disruptions, and that this would also allow circulation and traffic efficiency to be maximized around their perimeters (Fig. 4-10). Thus, while the proposed central east-to-west freeway would indeed cut the city in its middle, it would also act as a dividing line between two such communities in a way that would avoid "interfer[ing] with its internal life or movement" (Doxiadis Associates 1969c).

The above discussion thus emphasized how in the Dynapolis model of an ever-expanding city, where mobility was assured by the free circulation of automobiles, the smallest scales were completely dedicated to the creation of neighborhoods amenable to the establishment of a stable human communities. As Doxiadis wrote in *Ekistics*, "The basic cell of human settlements is an ekistics unit which is the physical expression of a community. . . . This unit should function without being fragmented in any way, for if it is, the settlement will not perform its role properly" (Doxiadis 1968). While the large entity of the Dynapolis was thus dynamic and able to grow without limits, the small units were seen as static, with their economic, social, and demographic parameters and capacities established in a way that would be resistant to change (Fig. 4-11). By allowing different conditions to govern the formation of the city at the large and the small scales, Doxiadis wrote, "a dynamic city . . . can be built with static cells, every one of which corresponds to the ideal city of man, the whole corresponding to the dynamic settlement of the present" (Doxiadis 1966).

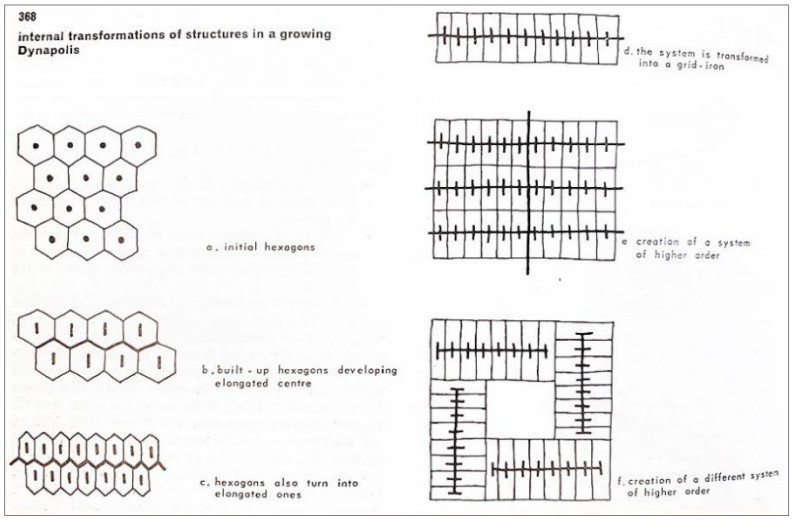

Fig. 4-10: The way centers within sectors grow and connect in the Dynapolis. Source: *Ekistics* (Doxiadis 1968).

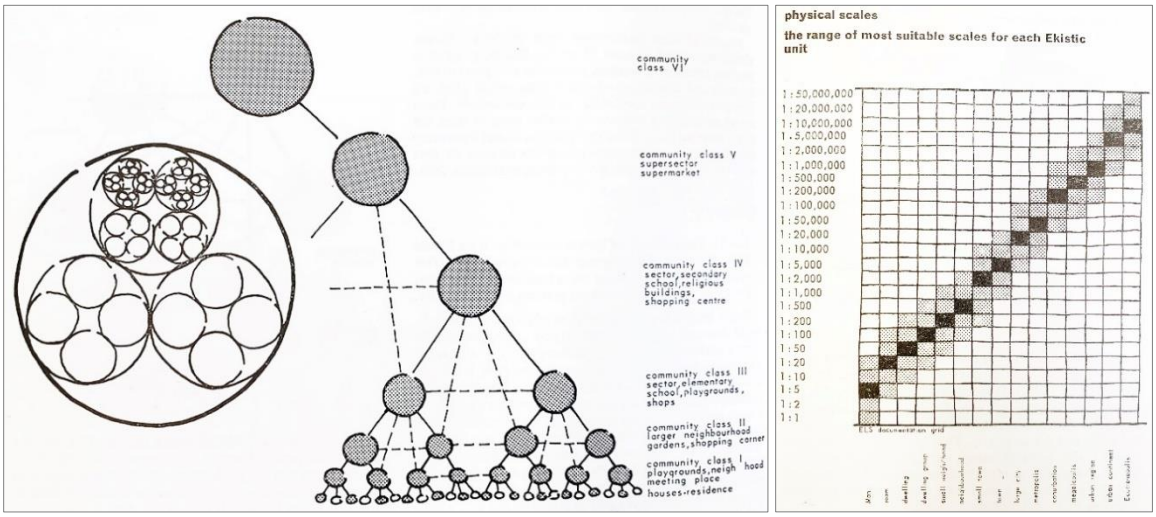

Fig. 4-11: Scales of habitation in the Dynapolis. Left: hierarchical structure. Right: physical scales. Source: *Ekistics* (Doxiadis 1968).

As Doxiadis further elaborated, "All communities, and therefore, all ekistics units tend to be connected to each other in a hierarchical manner. Every community of a higher order serves a certain number of communities of a lower order, and the same is true of a specific function within ekistics unit." Interaction at a larger scale also had a social goal: while smaller communities were designed to be homogenous, they were set up in a way that would allow them to interact with one another and so promote the slow and highly controlled intermixing of social classes and the "gradual development of social balance among the several classes of citizens." (Doxiadis 1966). This notion of the organization of smaller units into a more complexly functioning whole was also a manifestation of Doxiadis's modernist view of the city as a machine. By splitting a large, diverse entity into smaller, more homogenous elements, that larger entity could still offer a sense of local order and social control. Within each sector, growth would thus be prescribed in ways that might protect personal freedom. As a repetitive unit of growth, "in a Dynapolis, each sector is more self-sufficient, more independent and more able to engender an independent attitude among its inhabitants," Doxiadis wrote (Deane 1965).

In pursuit of this vision the DA proposal refined the notion of ekistical classes in the Riyadh plan to divide the future Class VII city into six Class VI areas, each home to about 300,000 residents. While the commercial spine of the city would join these in a generally north–south manner, they would be divided from one another by high-speed roads that would allow east-to-west circulation and reinforce their character as separate urban cells. Each of the Class VI areas of the city would then in turn be divided into eight to twelve Class V units, which DA referred to as the "modulus," or standard building block, of the city. And these would be divided from each other by high-speed arterial streets established on a roughly 2 km x 2 km grid, which would create boundaries between the Class V communities, collecting their interior traffic for cross-city trips and allowing them to connect to each other without creating roads that cut across them. Each component of the grid (that is, each 2 km x 2 km Class V modulus community) would thus be free to establish its own internal organization. And each of these modulus communities, when fully

built out, would be large enough to house a population of 50,000 people with all the supporting commercial and social facilities of a small city, such as a high school, a shopping mall, a large mosque, and a sports and social club.

It would be at the next scale down, Class IV (corresponding to the size of a village), however, that the plan imagined the formation of true communities and coherent neighborhoods. Referred to as *hellat*, these were large enough to establish connections between their residents but not too large that this bond would be lost. In the Riyadh plan each Class V area was composed of four to six Class IV communities, each designated for a population of between 5,000 and 6,000 and assigned an area of approximately 0.75 ha.

A whole set of spatial and territorial relationships were formulated based on such convictions about the purposes of settlement organization according to standard relationships of scale. For example, each Class IV would be divided from each other by a small arterial collector and contain an area reserved for a local center that would be large enough to provide for the needs of residents in terms of shopping, schooling, social services, and religious life. This was the level at which Doxiadis believed the power balance would truly shift from a preference from vehicle circulation to pedestrian activities. And each Class IV community would in turn be divided into Class III communities (*harat*) of about 1,500 residents (Fig. 4-12).[39]

Fig. 4-12: Left: Riyadh's proposed community structure. Right: proposed system of hierarchal cells. Source: Left: Doxiadis Associates (1971) Constantinos A. Doxiadis Archives DOX-SAU-A18; Right: author.

[39] In reality, this did not work. When drivers encountered heavy traffic on main thoroughfares they tended to cut through the neighborhoods, disturbing their peace.

Meanwhile, working outward, each local center would be connected to each other by local streets, but also to the central commercial axis of the larger Class V modulus. The modulus spine would in turn connect to the central commercial spine of the entire city in a perpendicular manner. Meanwhile, within each community, the road network would allow vehicle access to every plot, while a separate pedestrian network would connect the community to itself without the needs for a vehicle. In keeping with this overall hierarchical design, the master plan detailed the formulas and algorithms used to calculate the community amenities required at each level and position within the overall structure.

With all these divisions, hierarchies, connections, and systems, Doxiadis was clearly aiming to balance automobile dominance in the city of the future with his understanding of the importance of local human socialization. Yet, while it is clear this was his goal, many DA plans resulted in cities dominated by cars, and in the case of Riyadh today, evidence of vital neighborhood pedestrian life is hard to find. What went wrong? And why were his goals not achieved? This will be part of the discussion in the next chapter.

G. Conclusion

As this chapter has tried to show, the outcome of the DA work in Riyadh was a plan that sought to envision the future city according to a standard model derived from theoretical study of the general problem of cities. What Riyadh ought to look like in the year 2000 was a blend of many images: one that Doxiadis held before arriving in the city, another the Saudis held before meeting Doxiadis, one that the profession dictated, and, last, an image that resulted from the analysis and work in the city. In accordance with Doxiadis's theory of ekistics and his working model of the Dynapolis, this led to the proposal of a unified and highly ordered scheme which above all would be economically efficient in terms of road network and infrastructure. In its final report, the DA team also boasted that their plan had been successful in addressing the existing pattern of growth in Riyadh, as it reflected issues of climate, culture, and patterns of living, so as to ensure a future concentrated and centralized form for the city that would avoid the hazards of overcrowding (Doxiadis Associates 1971).

What this product ultimately reflected was the reality that despite the many particular qualities and history of the existing city and of Saudi culture and political traditions, as a new type of modernist, Doxiadis saw his purpose as to instill universal forms of order that might allow any city to become an integral component of what he regarded as the future global urban civilization. In the interests of largely European-derived ideals of freedom of movement, association, and economic self-determination, the primary attribute of this city was that it provided an efficient armature for growth. In the working out of such an urban vision, however, particular structures for circulation and the organization of urban fabric were proposed through the science of ekistics. And their realization through the model of the Dynapolis might be justified according to a series of logarithms and mathematical formulas that made them appear all but inevitable. Thus, once a client agreed to the method of city design on which the work of DA was based, the form and structure of the future city was to a large extent predetermined.

This, of course, was the essence of the modern project in the mid-twentieth century, which often worked backward from theoretical premises to replace local cultural frameworks with

universal standards of design. The dominance of the automobile, the hierarchy of community structure, a linear pattern of growth, the separation of urban functions — even the idea of a consistent, unitary city form — all of these were determined in advance. What mattered was the use of science to justify them and make them appear as the only logical conclusion. The process became a matter of fitting the ideas to the terrain in question, in the same way the ancient Greeks had exported their ideas of correct, rational city form to the many different physical and cultural contexts around the Mediterranean. It is important here to note that in DA's work, there was a clear separation intellectually between process and outcome: while the outcome might be predetermined in many regards, the process was still significant because it could be used to generate massive amounts of data that might be used to further define and support these conclusions.

The way such externally derived formulas overrode all local complaints may be seen in one revealing anecdote. On March 18, 1970, a meeting was held at the DA local office in Al Malaz. Attending were the Riyadh mayor, Abdulaziz bin Thenayan, the city engineer Rassem Shaath, and Ch. Bislanis as a representative of DA. The meeting had been scheduled at the request of the mayor to coordinate ongoing programs of work between the municipality and DA's local office and to solve some pending issues. One particularly contentious issue concerned the widening of a road called Gharb El Bakhira (labeled Road 52 on the plans and in correspondence). Per DA's recommendations this was to be transformed to create a unified 30-meter right of way. However, at the meeting, the mayor explained the municipality's position and the difficulties it faced in expropriating and compensating the owners of surrounding parcels. He pointed out that DA's recommendations would also create problems with higher authorities, which was something he strongly did not wish for. And he pleaded with the Greek team to compromise and accept a middle ground — in this case that the width of the right of way be reduced so that the plans would have less of an impact on local property owners. However, DA's team were firm in their response. No exceptions could be made, they reasoned, because the width they had specified was not arbitrary. Indeed, it was the product of "traffic needs for the year 2000," based on studies of "expected traffic loads and dense habitation in that part." They thus insisted that their specification was the only option available, the product of rational, scientific studies, and it was out of their control to change it. They advised the mayor to do everything to ensure that the correct street right of way be created, including settling on whatever sums the adjacent landowners wanted as compensation (Doxiadis Associates 1970a).

In a subsequent meeting held eleven days later, the mayor informed the team that the street would be included in the road-improvement program according to the DA specifications, which the municipality planned to initiate soon. And in a later letter to the head office in Athens, DA's local team explained that "the mayor in his desire to follow our solution as much as possible, informed us that he is planning to oblige owners to 4 m. setbacks from both sides, so they will able to expropriate them in the future, thus the row will become 31 m." What the Greek team initially proposed was thus officially adopted — despite its impracticality, difficulties on the ground, and opposition from the municipality.

The anecdote reveals just how highly regarded were the role of experts and the standing of universal solutions in the preparation of the Riyadh plan. It illustrates that the right answer — at least in the expert's opinion — should not be altered because of situations on the ground. In hindsight, this approach may seem dangerous and harmful, yet it was common at the time. Such a faith established the political justification for the existing context to be scientifically corrected "from above" to allow efficient new forms to emerge based on the pursuit of a rational ideal.

Typical of its moment, such an approach contrasted radically with earlier and later approaches to planning, which sought to accommodate growth according to a more incremental, organic process to achieve a different quality of efficiency from the bottom up.

In the history of planning, the Doxiadis model may thus be seen to mirror many other attempts to create ideal city forms. In its attempt to conceive of city planning as a tool to solve larger social problems, it sought to create a new science that would ensure a rational ordering of urban space. It did so through the aggregation of massive amounts of data which would then be subject to neutral scientific analysis. However, the formal outcome of this process served largely to confirm predetermined notions of form as "the only rational conclusion."

Surprisingly, however, while the DA team's public position was to constantly affirm their faithful pursuit of neutral scientific process, another anecdote I discovered in my archival research indicated that this was not always the case behind closed doors in actual practice. And the area where the anecdote indicates this occurred — demographic projections for the future population of the city — would later be criticized during the plan's implementation as one of its most problematic components. In short, what this anecdote revealed was that in the course of projecting the future population of the city, the DA team refused to trust its own scientifically derived numbers. Indeed, the more human dispositions in their practice led them to change these numbers, thinking that figures of that scale were impossible to achieve, and that the city could not possibly grow to the extent that their own scientific, data-based planning approach indicated.

As the DA final report stated, "If we consider estimations in regard to Riyadh's future population growth based on current trends, the numbers that result from this process to the year 2000 are high to an impossible degree" (Doxiadis Associates 1971). Instead, the report theorized that the city's recent rising trend of population and territorial expansion would abate in the coming years. As Riyadh matured as a city, the report even projected a decline in its growth rate. It thus envisioned that Riyadh would not become as dominant as it hoped to be; it would become the focal point for the central region of Saudi Arabia, but it would not become a main hub for the whole country. The report predicted instead that the cities of Jeddah and Dammam would continue to compete for population and economic activity with Riyadh, and that these two coastal cities would have better success in luring migrants from other parts of the country because of their positions with respect to industrial development, their ports, and their less isolated locations.40 Doxiadis, the scientific planner, did not trust his own science completely and was ultimately wrong on both accounts in his predictions of what would curb Riyadh's expansion. This trend further emphasizes the separation between process and outcome. Thus, in this instance, the result of the data collection process contradicted the pre-conceived outcome, and so it was not trusted or adopted. This also hints back to the discussion of the earlier chapter, in which the pursuit of science, data, and process was seen as much as a means to depoliticize the planning process, to stake a claim to neutrality and legitimacy, as they were actual practical tools to devise a plan.

Ironically, had the team approached the task as a scientific endeavor only, stripped of human assumptions or preconceived images of what Riyadh should grow to become, it would have probably been more accurate in its prescriptions. As it turned out, the actual numbers the team

[40] In the report, DA's team presented five alternative scenarios for this growth. They suggested that the technical one that emerged purely from algorithms and formulas was impossible — hence, there was the need for human correction to make it more plausible. Alternative A suggested that Riyadh's population would reach 985,000 in 2000; B suggested it would reach 1,170,000; C suggested 1,385,000; D suggested 1,600,000; and E suggested 1,840,000.

arrived at for the future growth of the city were much closer to what eventually occurred. The results of the team's algorithms suggested that the city would grow to reach 3 million people by the year 2000. In fact, it would reach a population of 3.1 million residents by 1997: the mathematical prediction would have only missed the mark by three years. But by underestimating the future population of the city and by editing the data to fit this perspective, they produced a set of inaccurate assumptions that would eventually compromise the plan's effectiveness as a tool to channel the city's growth.

In the following chapter I will turn to how the plan was implemented and how it did and did not shape the future form of the city. In this regard, I will try to show how (as with many other attempts throughout history to shape a city's organic growth to fit an ideal model), initial enthusiasm for rational order was soon overrun by more organic local forces and conditions.

Chapter 5: The Plan in Retrospect

> *We now open our eyes, we see the explosion, we understand the confusion and its causes, we have an exact diagnosis of our disease and we can begin the therapy.*
>
> *The process has begun. There is no reason for any pessimism when humanity learns the truth. We are on the proper road for the best harmony that humanity has ever achieved.*
>
> — Constantinos Doxiadis[41]

A. Introduction

With the approval of the DA plan, the city of Riyadh entered an entirely new phase of development. The plan set an ambitious goal for the complete transformation of its urban fabric in an attempt to harness its growth as the capital of a rapidly developing nation. The DA vision represented a bold commitment to a rationalized urban form that would completely turn the page on its former identity as an inwardly focused, traditional city. Although sections of the city, such as the Al Malaz district, had already adopted a more modern bearing, the DA plan aspired to create a radically modern future, not just add new districts and isolated state- and developer-driven projects in an incremental manner. The plan would open its form to a fundamentally new vision of modern living. It would also reach back into the past to reorganize areas of existing fabric to ensure a comprehensive unity of form.

While the plan was officially adopted in 1972 (hence subsequent reference to it as the "1972 plan"), the realization of elements of this vision started almost as soon as the DA effort began. As the last chapter showed, the "Ten Decisions" document and various transportation studies specified activities that could and should take place immediately, regardless of the final form of the plan. These included expanding and modernizing systems of vehicular circulation, relieving residential crowding in the oldest areas of the central city, and establishing the legal framework and administrative capacity to implement the far-ranging future organization of territory it contemplated (Doxiadis Associates 1969b).

However, as this chapter will attempt to show, the official approval of the final plan did not guarantee that the DA vision for the city's future would materialize as imagined. Although many areas of the plan were realized in the years immediately following its passage, including much of the work in the Action Area, the construction of new streets and highways, and the platting of land for new residential areas according to the DA vision of nested neighborhood structures, in other respects the rapid growth of the city resisted being harnessed by the hierarchical quality of the DA vision. Furthermore, the city's growth soon outstripped the regulatory capabilities of planners charged with confining it to the prescriptions of ekistics and the Dynapolis. The result was that by the later years of the 1970s, a new effort was required to extend the scope of the 1972 plan and

[41] From *Building Entopia* (Doxiadis 1975).

address its deficiencies. And by the end of the 1980s, most of the assumptions underlying it had been outpaced as a result of the 1970s oil boom, and entirely new development frameworks were being contemplated. By the year 2000, although elements of the plan remained, the envisioned shape of the highly ordered metropolis had been rendered largely obsolete.

This chapter will examine some of the reasons why this occurred. In this regard, it is important to note that planning historians commonly point out how many limitations and inadequacies plagued the DA project. Such criticism presents valid arguments, and this chapter will discuss a number of these as they are commonly invoked in the literature. But the chapter will also seek to explain how, despite this trajectory, elements of the plan still remain a vital force in the development of the city. Thus, while the DA plan may be offered up as a scapegoat for the problems of the city today, such a view presents only a partial assessment of the plan's legacy. Therefore, the goal of this chapter is to provide a more holistic understanding of the plan, which accounts for its complexity and properly credits its role in advancing the city's development.

B. Conventional Criticism

The single most common criticism of the plan in hindsight is directed at a core element of Doxiadis's method and his position as a planning practitioner: that his heralded scientific approach was no more able to predict the future than any other method. Doxiadis often promoted the work of his office to developing countries based on the superiority of his method. Yet, throughout the process of developing the Riyadh plan, the DA team made a series of calculations that were largely misguided. For instance, when the team was working on the plan in 1970, Riyadh was home to 355,000 individuals. As an interim measure of future growth, the team predicted that by 1980, the city would be home to 685,000 inhabitants. In fact, the city reached this population by 1976. Likewise, the plan's prediction that the city would have a population of 1,050,000 by 1990 was surpassed before 1982. And where it predicted that the city would have a population of 1,400,000 by the year 2000, its population by then was 3.8 million — more than two and a half times the plan estimate (Fig. 5-1).

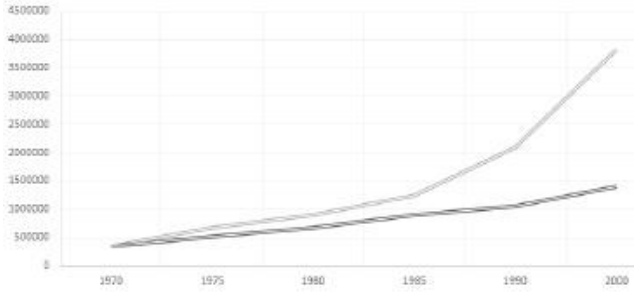

Fig. 5-1: DA's population growth estimates vs. actual population growth. Source: author.

Additionally, not only did the DA plan underestimate the city's growth in terms of population, but it also underestimated its physical expansion — in a way that was even more

dramatic. Thus, the plan predicted that Riyadh's urban footprint would reach 304 km² by 2000. In fact, its urban extents would reach 400 km² by 1976, just four years after the plan was formally approved. While defenders of Doxiadis's work might successfully argue that no planner could be held responsible for failing to anticipate such explosive population growth, the expansion of the physical terrain of the city was clearly something the plan had much more control over. Indeed, the fact that the rate of territorial expansion was greater than the rate of population growth would seem to indicate either a failure of its mechanisms to produce an orderly urban realm or a failure of the Saudi authorities to apply those mechanisms. Intentionally, the cells of his Dynapolis did not grow vertically, but multiplied themselves horizontally. And in a plan heavily dependent on the use of private automobiles, such horizontal expansion resulted in longer distances, ever-longer travel times, wasted energy, and an explosion in the cost of infrastructure projects (mainly roads). If Riyadh was indeed an organism, the process of growth Doxiadis proposed for it might have been considered suicidal.

It has been widely observed that this inability to predict the city's future explosive growth limited the overall effectiveness of the plan as a policy framework. Undoubtedly, this is an accurate critique, and it did constitute a major flaw in the work of someone who positioned data and scientific analysis at the core of his practice. It is also true that DA's inability to correctly predict future population trends was a critical failing, because, as a positivist, Doxiadis's methods relied heavily on the use of algorithms and formulas to drive other aspects of his firm's work. At the time, an ability to accurately estimate the future based on this method was one of Doxiadis's perceived advantages with regard to his competitors, and it was central to DA's projects everywhere. From the detached vantage point of science, Doxiadis conceived the role of the planner as being to examine the city as if it were a laboratory specimen, produce concrete predictions of its future growth, and devise a framework to guide the process of expansion. But eschewing subjective inputs also meant that DA's predictions for Riyadh's future growth were presented as scientific truths that could, in turn, provide a solid foundation for a host of otherwise relatively arbitrary decisions. The amount and nature of new housing construction, calculations of urban density, the level of required services, and even the layout and character of the transportation network were all based on those numbers. Doxiadis's projected image as an expert in predicting trends and his heavy dependence on estimations presented as the outcome of science created a brittle framework that failed to anticipate the need for contingent mechanisms should the analysis of existing data, in fact, not accurately predict the trajectory of the city's growth.

In hindsight, of course, it is clear why the extensive phase of data collection DA engaged in was unable to correctly predict Riyadh's future. What the city witnessed through the succeeding decades was an economic boom that was, in many ways, unprecedented. Thus, despite marketing himself as an expert in urban development in emerging countries, Doxiadis encountered a scenario in Riyadh that was truly startling, making it extremely difficult to anticipate. Yet it is also true that inaccurate assumptions had a particularly disastrous effect on the DA plan because of the significance DA accorded them in the planning process and the way Doxiadis framed his role as a planner.

It is likewise true that despite the emphasis on scientific planning that was emerging as a global trend throughout the 1960s and early 70s, very few planners believed they could accurately predict the future (Hall, Pérez, and Levy 2014). For this reason, a more dynamic approach had been advocated in other theoretical approaches, such as T.J. Kent's *The Urban General Plan* (1964). In addition, the theory and practice of planning were therefore recognized as

complementary. A master plan might be conceived of as setting a course for the future development of a city; but it also had to be conceived of as a significantly flexible instrument that, at least in the medium term, might be adapted to address changing realities on the ground. Otherwise, one might logically ask, what use was the effort to produce it? It had thus already been widely recognized that the rigid formal character of early modernist plans had been one of their greatest failings. While such an approach might be able to produce structures of great architectural quality, the process of planning, which by definition was intended to unfold over time, had to be flexible enough to account for changes in circumstances.

Ironically, it was precisely this scenario that the principles of the Dynapolis were intended to address. In theory, its principles — the linear expansion of the commercial core and the universal replication of neighborhood modulus units held together by a grid of arterial thoroughfares intended to ensure efficient intra-urban mobility — should have been able to accommodate the unexpected surge of the city's population. Emerging from the scientific underpinnings of ekistics, it should have simply created a framework for the city to grow faster and farther than predictions indicated it would. However, such presumed elasticity never produced the results it was supposed to. In particular, the elastic qualities of the Doxiadis vision became separated almost immediately from its other aspects, particularly its carefully calibrated formulas for neighborhood formation. Thus, while the population of the city expanded rapidly, and while its frontiers pushed outward into the surrounding landscape, much of the area within its existing planned extents remained undeveloped. This indicated a central weakness in the plan process: although it established a rational framework for the development of new urban terrain based on universal automobile access, it could not guarantee adequate administrative control of this process. Instead, it opened the door to real estate speculation that almost immediately subverted the more tightly calibrated qualities of the DA vision. And once this leapfrog process gained a foothold it offered a precedent for future growth that in many ways became self-fulfilling.

As critics have pointed out, the result was that as migration to the city from across Africa and the Middle East exploded through the 1970s, Riyadh turned its back completely on its history. From then on, the model for urban life in the Saudi capital would be one of high-speed auto access from detached villa housing to air-conditioned shopping malls and office parks (Fig. 5-2). As a precedent for such a city, scholars today point to Los Angeles or Las Vegas, cities of the American southwest that were similarly developed according to a universal grid. Of course in the American case this process had been deliberate. The grid had been laid over new lands in the American West as part of the Public Land Survey System proposed by Thomas Jefferson and begun in 1785 as a way to encourage its rapid settlement and commercial exploitation according to a universal system of parcelization. In effect the Doxiadis grid created a similar outcome, despite its original intent having been to create self-sufficient urban modules that would build the intimate qualities of human sociability that are characteristic of traditional villages and small cities into the fabric of a limitless metropolitan future.

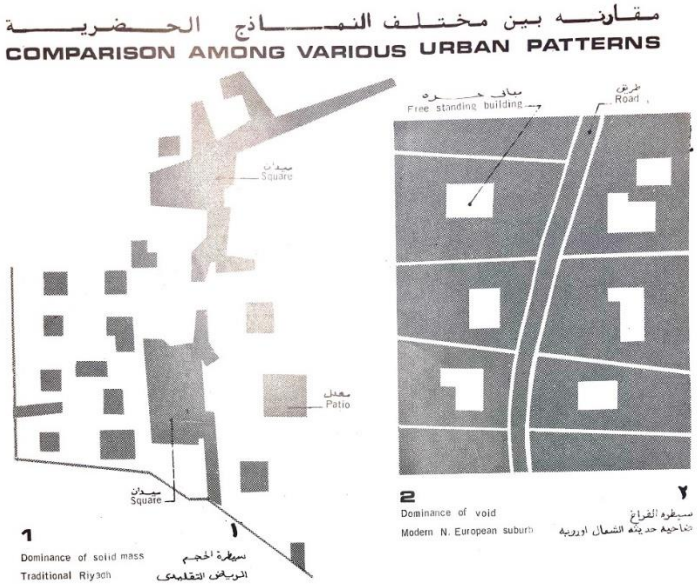

Fig. 5-2: Comparison between the old (1) and new (2) fabric of Riyadh. Source: Doxiadis 1972.

C. Subsequent Development of Riyadh

Overall, the general parameters of the 1972 plan were adopted and followed, at least initially, to a fair degree; however, it is also true that several of its major recommendations were modified or largely ignored. As a result, divergence from the goals of the DA plan began to occur almost immediately. According to the principles of the Dynapolis, the plan specified that the central axis of growth (the city's commercial spine) would extend to the northwest, with a secondary axis crossing to the north of the city center between the royal areas to the west and the existing airport. However, by 1976, the cross axis of the Khurais Road, which connected to the main highway leading east to the rapidly developing oil center of Damman, had clearly established itself as a competing growth pole. Not only did such an unplanned vector of growth encourage the development of open lands on the periphery of the city, but reconception of the road as an "active center" conflicted with the very principles of the Dynapolis (Middleton 2009, 149). In addition to establishing a frame for interdistrict mobility, the DA plan envisioned the arterial streets dividing one community Class V (and by extension Class VI) from every other as boundaries enabling the development of relationships of scale between their smaller parts. But in this case, the preexistence of a major transportation corridor already created a field of commercial opportunity that subverted the carefully calculated patterns of projected urban growth.

In this regard, the spread of development eastward before modulus areas close to the center were fully built out revealed a more serious deficiency in the Dynapolis model and the application of the principles of neighborhood hierarchy within ekistics (Middleton 2009). The issue was that it took a long time to fully develop a modulus unit to the point where its population could sustain the planned level of local neighborhood commercial and social facilities. This retarded the inward

development of community life and led to the dispersal of communal functions along roads intended to separate modulus units from each other. By the middle of the 1980s, this pattern of growth led to the expansion of developed areas far beyond the planned physical boundaries foreseen by the DA plan. Thus, by the mid-1980s, without the population concentration to support the construction of internal neighborhood and district centers, Al Bothie (1986) observed how commercial and social functions had come to be located not within areas of settlement but between them, on peripheral commercial strips, where they were interspersed with large areas of open space. And eventually the only way to make these undeveloped areas attractive to development was to open them up as sites for mega-developments that created extreme conflicts with the scale of planned and existing areas of development (Al Bothie, 1986).

What this trend illustrated was that an inability to harness the forces of private real estate speculation was one of the weakest aspects of the Doxiadis's plan. Although the Dynapolis-inspired pattern of roads and infrastructure could be laid physically on the land, it was not possible within the context of a fast-growing Riyadh to build whole modulus units according to the highly ordered social conceptions they were intended to serve. This, in addition to the failure to build legislative capabilities able to govern the development, led to the trend of leapfrogging development. In its pursuit of a detailed spatial hierarchy and social order, the DA plan thus did not take into account the incremental nature of free-market development, whereby each new project changes the landscape for every other. Without a controlling, centralized entity to ensure the creation of complete modulus units, competing private interests led to a weakening of the overall order and purpose of the plan and resulted in the spread of development in unanticipated directions.

In addition, there were aspects of the plan that emerged from Doxiadis's theories that were simply unrealistic or that proved contradictory in application. For example, the idea that the smallest scales of development would be organized for pedestrian access conflicted with the harsh desert environment, especially when they were presented in the abstract. Without complex solutions to combat the climate difficulties, Riyadh's environment made walking even moderate distances arduous for much of the year. In the traditional urban fabric, pedestrian life had been supported by the compact nature of the urban form, which moderated the effect of the harsh desert environment and reduced the distances to be covered. But the DA plan was premised on a more dispersed, open pattern of settlement in accordance with modern principles of mobility and access to light and air. To avoid the perceived health threat posed by overcrowding, its vision was thus one of wide streets, generous setbacks, and minimum lot sizes. Together with a system of height restrictions, this prioritized the construction of stand-alone dwellings, which seemed to defy the simultaneous intent of the plan to create a concentrated urban form.[42] The result today is that while pedestrian areas of the city do exist, pedestrian activity is not a major feature of residential neighborhoods, and people typically access their homes by car. Pedestrian areas are more typically destinations separate from residential areas, and many of them are located indoors where their climate can be controlled.

As a result of these conflicts, the overwhelming pressure for growth through the middle years of the 1970s led to the rapid inscription of the physical features of the plan over the entire area identified as future urban terrain. And the rapid building of new roads to access areas of essentially speculative development created great demand for state agencies to provide them with

[42] These trends have only been exacerbated by the spread of new technologies since the 1990s.

water, sanitation, and electricity infrastructure. In addition, several huge new developments were initiated outside the urban boundaries proposed in the DA plan. Among these was a large area of low-income housing across the Wadi Hanifa to the southwest of the old city. Not only did this project increase pressure on the area of the existing central business district but it created great problems with regard to infrastructure. It was precisely the difficulty of spanning this low-lying, flood-prone area with a unified system of urban services that had led the DA plan to envision it as a boundary to the western expansion of the city.

The death of Doxiadis in 1975 created further problems for the implementation of the 1972 DA plan (Middleton 2009, 134). But it was the eventual realization that the state could not keep up with the seemingly relentless need for new infrastructure in leapfrogging development areas that led the Saudi government to seek additional outside consultant services. And it was no accident that the firm chosen was SCET International, a French firm specializing in urban infrastructure. In principle, the firm was assigned to develop a revision to the 1972 plan that might address a series of problems whose solution had not been part of the original DA effort. But in practice the solutions proposed ignored many of the intentions of the 1972 plan and established new patterns of development logic (Fig. 5-3).

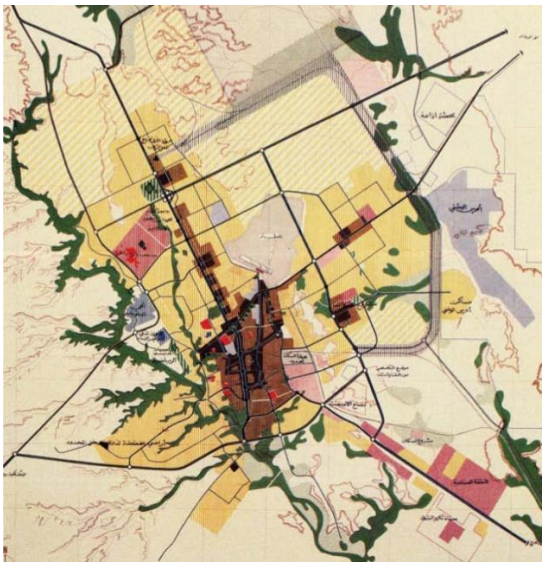

Fig. 5-3: SCET Master Plan for Riyadh. Source: Riyadh Municipality.

Indeed, by the time the SCET work was complete in 1978, and even more so after it was updated in 1982, it had overlaid an entirely new development framework on the DA plan. It kept the façade but lost the core, the logic, and the intentions. While it accepted the basic physical structure of the Doxiadis grid, it abandoned most of the social logic behind the structure of modulus units and a hierarchy of community forms. Instead, as a logical extension of ongoing development trends, it defined territorial organization according to a system of commercial corridors, which ultimately came to dominate the development of the new eastern and southern areas of the city. Meanwhile, in the central areas of the city, SCET concentrated on short-term development and

revitalization strategies that focused on existing commercial corridors and largely ignored the more structural reorganization of the territory proposed by the DA plan (Middleton 2009, 137).

Another result of the SCET plan was to largely dispense with the single directional axis of commercial growth that was an essential element of the Dynapolis model. Instead, it largely accepted a return to the multiaxial pattern of growth that had been developing in the city in the 1960s before the arrival of the DA team. And in this regard a central organizing element of the new scheme was a ring road that crossed the Wadi Hanifa north and south of the existing city to connect new development areas beyond the extent of the DA scheme without increasing congestion in the central parts of the city. The very purpose of this new urban element thus conflicted with the core principle of linear growth underlying the Dynapolis model. The SCET plan did, however, retain its other main component, the 2 km x 2 km grid, as a way to divide the urban terrain for purposes of parcelization, access, and infrastructure development.

By the time the SCET proposals went into effect in 1978, the developed area of the city already exceeded its proposed extent as envisioned in the DA plan for the year 1985 (although many areas of land within this urban field remained undeveloped). Thus, as a target for the city's urban extent for the year 1990, SCET proposed a territory of 850 km² — well beyond the 305 km² proposed for the year 2000 in the DA plan.

In many ways, the SCET plan was a reaction to existing trends. Where Doxiadis's model had sought to organize the urban terrain according to theoretical principles, the SCET work began with crisis conditions being created by existing trends and tried to direct them toward greater order without reference to an abstract universal framework. It thus presented a practical effort of planning rather than planning in the pursuit of larger idealistic principles. However, this led it to dispense with many of the more nuanced elements of the DA plan, particularly its attempt to moderate the impact of private automobiles through the creation of an elaborate system of nested neighborhood structures.

Meanwhile, architectural ideas had also moved on by the late 1970s from the embrace of abstract rational forms envisioned in the DA plan, to pursue emerging interest in neotraditional design. One such influential project was that for a Diplomatic Quarter, which was realized in 1982 and adopted a radial layout that was more typical of English Garden City planning from the 1920s. In this and other cases, emphasis on scenic layout and symbolic as opposed to strictly modern building design could still be subsumed within the Doxiadis grid. However, a profusion of differing expressions would also weaken the unified design logic behind the comprehensive modulus structure. And on a community scale, they created project areas of highly idiosyncratic form that broke with the original intention to present a unified appearance.

Before the expected year 2000 planning horizon of the DA plan, the explosive and largely freewheeling growth of the city necessitated initiation of an even further planning effort. This recognized that, as a result of the ongoing development patterns described above, the city could no longer be described as having a unified structure. In 1997 the MEDSTAR metropolitan strategic planning process thus departed once and for all from the unified focus of the Dynapolis to acknowledge that the city was becoming an agglomeration of multiple urban centers (Fig. 5-4). The MEDSTAR effort completely abandoned Doxiadis's model as a structural frame, although it retained its logic, many of its elements, and of its some small-scale ideas. As a new comprehensive master planning effort, MEDSTAR was also needed to address a series of issues that had arisen that the DA plan had never anticipated. Among these were threats to environmental quality, the

degraded nature of older areas of the city, social justice for lower-income residents, and the need to offer alternative modes of transport beyond a reliance on private automobiles (ADA, 2003).

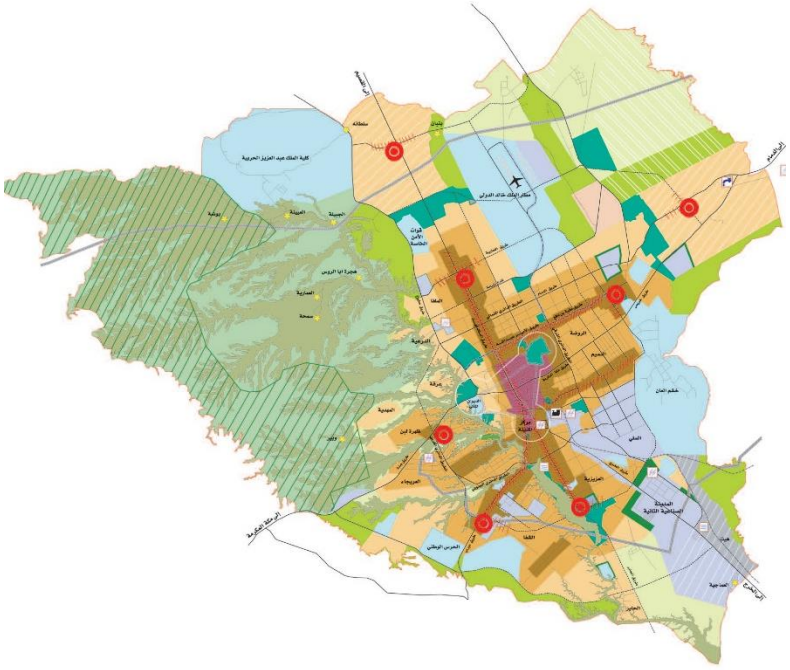

Fig. 5-4: MEDSTAR plan. Source: Riyadh Municipality.

The current impact of the 1972 plan varies depending on the scale at which the city is viewed. At the smallest scale, there is little sign of Doxiadis or his plan, and in terms of building typology, there are particularly few similarities with what was proposed in the DA master plan. At the next scale up, Doxiadis's fingerprints, however, are clear and evident. Specifically, the design of urban neighborhoods follows his logic of community building, and there is evidence of urban spread with this approach. However, the scale that connects those communities is far from what Doxiadis imagined. Finally, at the largest scale, that of the entire city, the result is a mixed bag. On the one hand, it is still possible to identify the idea of Dynapolis, because that vision inspired the creation of a main spine and a grid that expanded beyond it. On the other hand, the unified hierarchical structure of communities and the single directional focus that were hallmarks of the proposed Dynapolis did not survive.

D. Contradictions in the Plan

As the last section began to show, one of the underlying reasons for the quick erosion of the plan as a framework for development involved its many inherent contradictions. No doubt, these reflected Doxiadis's character as a man of many contradictions. He championed automobile dependency but advocated the maintenance of traditional community forms and the human scale. He believed in the need for a new model of efficient, universal urban form but called for sensitivity

to local environmental and social conditions. He aimed to balance the ideals of theory with practicality of application. He advocated for extreme order but called for a man's complete freedom. And he criticized cities frequently but was a firm believer in them as the ideal mode of living. In this regard the plan for Riyadh was not different from his work elsewhere. Within a single document (or through the course of a single meeting) he might express many seemingly contradictory notions and directions for action. Yet it was almost a matter of faith that those on the receiving end of these positions would still seek to carry them out in the hope that they might eventually be reconciled — an outcome Doxiadis often achieved in other projects. They might ask questions about specific practical concerns, but they would normally defer to Doxiadis's presumed experience and unwavering belief in the value of the scientific approach he championed. In hindsight, however, it is evident that the science of ekistics and Doxiadis's efforts to promote it as the basis for human settlements everywhere embodied a number of conflicting assumptions. And while these might be reconciled in pursuit of an abstract humanistic ideal of settlement formation, their shortcomings were often all too clear when they were put into practice. This was certainly the case with the Riyadh plan.

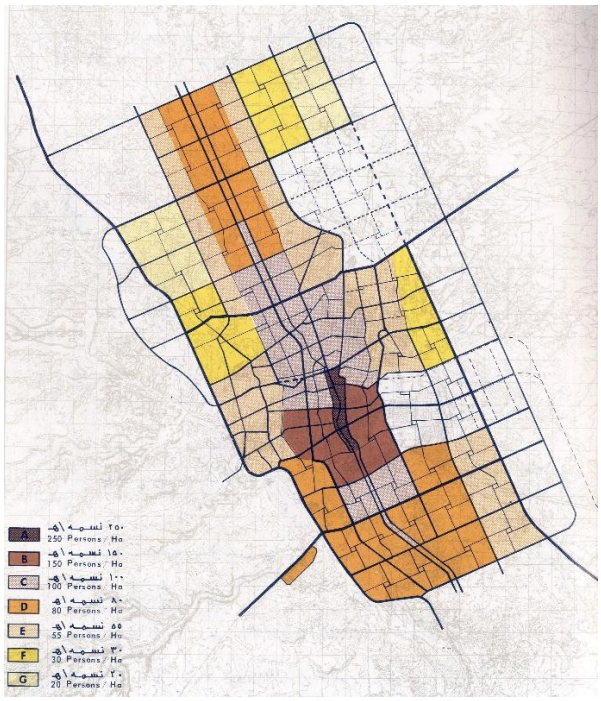

Fig. 5-5: Riyadh's proposed density. Source: Doxiadis Associates (1971) DOX-SAU-A18.

For instance, Doxiadis's reports often called for the development of a compact urban fabric. Thus, according to the DA plan, "Studies of traditional neighborhoods and its architecture style suggest that it is favorable to implement high densities rather than low densities when planning Riyadh because the first is more suitable to climate and heritage of Riyadh and Saudi Arabia in general" (Doxiadis Associates 1971). Yet, despite such stated intent, the plan actually proposed a conservative overall density target of only 70 people per hectare — inclusive of all residential areas (Fig. 5-5). Even the densest areas in his proposal were very low when compared to the old

city. This meant that while certain central areas of the city might still be imagined as relatively dense, many of the new outlying areas of "urban" settlement would have densities below ten units per acre. Moreover, the density figure for the entire city — calculated as net of all other lands set aside for special uses, industrial areas, open spaces, and a new airport — would only have approached that of a medium-density U.S. suburb.

Furthermore, not only were these actual density targets not nearly as high as might have been expected given the plan's numerous expressions of support for dense urban fabric, even those levels might not have been realized if the plan had been fully implemented, given its other seemingly contradictory recommendations. Indeed, many of its details seemed designed precisely to limit the possibility that the future city might be built out to anywhere near the overall gross density targets. These provisions included the dedication of extensive areas to roads. Another recommendation suggested building heights were limited across nearly the entire city to four floors, and in many outlying areas to two. The plan even proposed minimum lot sizes that reached 1,500 m² (0.37 acres) in some of the newer neighborhoods, while a minimum lot size of 400 m² (0.10 acres) was recommended for most areas of the city. The effect of such measures in practice was to establish a subdivision pattern that would never have allowed anything near the overall theoretical density targets. Additionally, the proposed building code that the DA team submitted in its final plan report included extensive setbacks and low FAR requirements that seemed to largely prohibit the construction of traditional attached building forms. Indeed, in many respects this code seemed to preclude the building of any housing form other than single-family detached houses set back from the street. Thus, while the plan's stated goal may have been to produce a concentrated urban form, almost all its specifics were directed at producing a contrasting outcome.

Another major contradiction in the plan concerned the city's proposed urban character. Throughout the different reports and plans, the DA team often argued that the city should embrace local heritage as a reflection of the rich cultural history of its inhabitants. As the plan explained, "Every town has its unique cohesion and style, and Riyadh has its unique style, thus, with the exclusion of some new residential areas planned indifferently on Western prototypes, the rest of the city will have its unique cohesion and style" (Doxiadis Associates 1971). Yet, while such statements may have been compelling in theory, in practice the plan proposed something very different. The new requirements for building embodied in the proposed regulations and codes, when instituted in practice, could only lead to a significantly different mode of life than that which had traditionally existed in Riyadh.

Throughout the master plan report suggestions were likewise made that the old city and the way its urban morphology had developed reflected local cultural and social requirements that should be adapted in future plans. Thus, the plan argued, "The difficult task that should be tackled is not to build a completely new city, but to build a city that is a continuation and extension of the current city and its fabric" (Doxiadis Associates 1971). However, as shown in previous chapters, the plan was designed for anything but such continuity. Gone would be neighborhoods of attached, inwardly focused residences on narrow streets organically composed to reflect family and clan associations and to shelter their residents from the harsh desert environment. New environments would be open to light and air based on calculations of mobility rather than concerns for security from intrusion. Commentators have thus noted how this clearly separated the future Riyadh from its cultural roots. "The plan actually ensure[d] the departure of new Riyadh from its traditional past, both in scale and in character" (Al-Hathloul 2017).

Overall, the plan called for human considerations while designing mainly for automobiles; it highlighted the importance of the old town without really incorporating it in the proposal; and it mentioned the significance of the local topography while largely ignoring it in specific design proposals. One cynical view of these contradictions is that Doxiadis employed such an approach deliberately. Thus, much as he used claims of scientific neutrality, he used catchy phrases to make the claim of local cultural sensitivity even when his actual proposals reflected little evidence of this attitude. Critics have thus faulted him for using an apparent concern for local cultural and environmental values as a mechanism to reestablish the legitimacy of modern urban design thinking at a time when modernist projects were under extreme scrutiny for their disregard of local conditions elsewhere. In effect, such language could be useful because it created an image of Doxiadis as different from other, insensitive modernists, increasing his appeal and helping him gain new commissions. (Pyla 2008; Ménoret 2014; S. Al-Hathloul 2017).

With regard to Riyadh, it might thus be possible to argue that by constantly referring to the old town's worth and the valuable cultural precedents it represented, Doxiadis was able to establish the perception that his firm would propose something other than an efficient modernist machine. Certainly, such a critique would help explain why the DA plan could talk at length about the preservation of the old city, but how in the end local considerations would have little influence on the city's future form as it expanded rapidly beyond its old boundaries. Likewise, it would explain why little consideration was given to topographic context or local climate beyond the simple gesture of recognizing the Wadi Hanifa as the city's logical future western boundary. According to this view, working closely on a site and gathering extensive information allowed DA to establish a reputation for local sensitivity, even if the firm's eventual goal was to apply a preconceived model to Riyadh.

An interview with a government official involved with the DA project provided evidence of just such a framework of perceptions. As the project was unfolding, the official said, he discovered that working with Doxiadis was different from working with other planners then practicing in the Gulf region, because as a firm DA valued what Riyadh was and was working to preserve it.[43] But this approach did not materialize in the final project. People reading Doxiadis's writings without studying the outcome of an actual DA project might not appreciate this problematic aspect of his work: all the locally generated data that went into the initial research phase of a project might have little impact when it came to actually giving a project real local character. Thus, while DA might claim to justify the size of a city, its density, and its road capacity based on locally generated data, the nature of the proposals, the logic behind their specific arrangement, and the actual design and details were largely determined based on a series of standard calculations made in Athens.

"In all cases, due consideration was given to pertinent conditions prevailing in the country for which the project was studied," claimed the DA team in one of its letters to Saudi authorities. The team specifically mentioned areas such as culture, education systems, traditions, building

[43] These comments are taken from an interview by the author with Rassem Shaath, the city's engineer at that time and a main liaison from the municipality with the DA team. When asked about the choice of Doxiadis, Shaath initially stated that he personally was not happy with it because Doxiadis was not as well-known as other names on the short list. However, after working with him, he said "it was a pleasant surprise" to witness how sensitive his team was to the local context and how concerned they were in their attempts to preserve the old town. He and others were initially very satisfied with the work of the DA team, and its consideration and acknowledgment of the old town was one of the main reasons.

materials, and methods of construction as factors they would consider once they began putting together their detailed proposals (Bislanis 1969). However, the plan's logic had more to do with the application of universal principles. One might even conclude that the purpose of the local research was to establish the parameters of a present context so as to make the application of the universal model more effective. Local research would also provide the appropriate veil of "local sensitivity" to legitimize this effort.

E. Universalism

The analysis above indicates that, while inadequate predictions for future growth may have been the primary reason why the DA plan was rendered obsolete less than five years after its adoption, the DA effort was flawed in other important regards. As indicated above, an argument can be made that while Doxiadis's method heavily emphasized local sensitivity as a product of data and analysis, the resultant plan produced by DA largely took the form of a preconceived solution that was only edited in a minor manner to accommodate the specifics of the challenge in Riyadh. And in the years since, such observations have provided grist for a more general critique of Doxiadis's planning ideals — and the goals and vision of the Modern Movement in general. Such an argument has, for example, been directed toward the plan's great dependency on private automobiles. Others have pointed to its lack of concern for humanizing social elements and its strict separation of uses. Furthermore, as a modernist machine, it has been faulted as creating a generic, contextless entity. Thus, while it may have been envisioned as functioning well to establish a rational organization of space and create new patterns of mobility, it lacked character or connection to cultural or environmental conditions. The latter critique has been a general feature of postmodern planning discourse, which has argued that the modernist pursuit of universal spatial forms and social norms was misguided.

From this point of view, it might even be argued that the plan for Riyadh displayed all the character of something constructed in a lab: that a person without prior knowledge of the city might have difficulty guessing where in the world it was to be applied. Essentially, from this point of view, what the DA team proposed to replicate was a modernist dream conceived somewhere else — perhaps in Athens. Doxiadis thus imagined a future city that would be a product of pure rationality. There was little in it that was Saudi, Arab, or even Middle Eastern. The plan only happened to happen in Riyadh.

Extending this critique, it may be tempting to see Doxiadis's many projects globally as "typically" modernist. But as pointed out in Chapter 3, and as I sought to explain in the detailed analysis of the Riyadh plan in Chapter 4, while Doxiadis various ventures were based on a search for universal principles, he deliberately sought to distance himself from the more arbitrary, doctrinaire modernist positions. In particular, he was very cognizant of the failings of CIAM. And although he may have been interested in reestablishing the authority and prestige this earlier group had enjoyed, his efforts to ground planning in a more rigorous scientific approach were intended to promote a new approach to the creation of urban space that could achieve a universal standard of quality and efficiency while still reflecting local conditions.

Nevertheless, from the outside, his vision of the ideal city may still appear as little more than a brutal, modernist machine. And from this perspective what most distinguished the DA plan

for Riyadh was that it sought to prioritize functionality, especially in terms of mobility, over any other social or environmental concern. Furthermore, what enabled this approach was an analytic mode that separated a city into its component parts, and then set out to design each to according to abstract principles of efficiency. To the modernist planner, the city was thus less a whole than an assemblage of parts, with each of its elements connected only through geographical proximity. This severe separation of functional areas was indeed one of the central features of Doxiadis's plan for Riyadh, and it was one reason why an efficient system of vehicle circulation was needed for it to function.

But beyond this, the separation of the city into component parts also enabled a mode of analysis and response that Doxiadis believed was needed to accurately predict and respond to the demands of the future. As he wrote, "Our possibility of prediction depends on our ability to isolate the different elements and phenomena within a settlement, to predict separately for each one of them and then, to combine these completely different curves or predictions" (Doxiadis 1968). The mixing of functions would create backward-looking conditions, typical of older traditions of urbanism, not of the modern future. As the DA team explained, "such a mixture would result in improper and eventually unhealthy conditions of life for the residents of the area" (Doxiadis Associates 1968b).

Postmodern critics have often pointed out how damaging this dividing up of a city into functional zones based on concerns for health and efficiency has been. They have argued that urban development should consider the city as a complex totality — more of an overlapping collage than a grid of separate parts. Thus, Peter Calthorpe and William Fulton argued in their book *The Regional City* (2001) that "[CIAM's] vision of superblocks and high-rise development became the basis of our urban renewal programs for the 1960s. At the neighborhood scale, specialization meant that each land use was isolated and developed by 'experts' who optimized their particular zone without any responsibility for the whole." They further explained that cities that followed this CIAMian attitude were more engineered rather than planned. The weakness of this approach is that it "tends to optimize isolated elements without regard for the larger system" — and in so doing, "we forfeit the possibility of developing a whole system approach or a design that recognizes the trade-offs between isolated efficiencies and integrated parts" (Calthorpe and Fulton 2001).[44]

There is no doubt that Doxiadis sought to practice urban planning within a tradition that would later become the target of such critiques. However, for Doxiadis a pragmatic approach based on mathematical calculations of value and the assignment of specialists to the design of various components of the urban system represented progress. It was essential in the contemporary world to eliminate outdated assumptions about urban order that did not correspond to the findings of science. Similarly, Doxiadis shared the modernist fascination for technological advancement as an unmitigated benefit. Considering the technologies available at the time, this led directly to the extreme dominance of the automobile in the logic and organization of cities. It was thus no accident

[44] Kevin Lynch [1960] described cities in this model as "made up of small, autonomous, undifferentiated parts, linked up into a great machine, which in contrast has differentiated functions and motions." Roger Trancik (1986) has agreed with Calthorpe and Fulton's criticism, explaining that "urban renewal worked together with suburbanization to replace the 'city beautiful' of early twentieth-century America with the noncity of isolated objects." Indeed, a whole generation of urbanists turned against such an attitude to focus on relationships between different elements and how the city in totality is a negotiation of tradeoffs between different elements. Other examples of this perspective include the work of Christopher Alexander (1987), Allan B. Jacobs (1985), and Gordon Cullen (1971). For more on this, see Broadbent (1990) and Moudon (1992).

that the single most important element of his plan for Riyadh was an extensive road network, designed in great detail, to which other components had to confirm and adjust. The view at the time was that the freedom offered by widespread personal mobility had the potential to create a better future for all humankind because it could extend the range of experience and association.

Despite Doxiadis's similarities of view with earlier modernists, however, the common narrative that lumps him in with CIAM's earlier figures is clearly wrong. That narrative often contends that, even though CIAM officially disassembled and broke up as an entity many years before, their ideas and agendas remained powerful in shaping cities for many years afterward, including through the work of Doxiadis. For instance, Pascal Ménoret (2014) grouped Doxiadis's work in Pakistan with other canonical works of modern urbanism: "along with Le Corbusier's Chandigarh and Lucio Costa's Brasilia, Islamabad was a high modernist city." Likewise, in his book *Whose Public Space? International Case Studies in Urban Design and Development*, Ali Madanipour (2010) claimed, "Doxiadis belonged to a generation of modernist architects and planners," adding that his plan for West Tehran was "a break with the context, in true modernist fashion."

The reality, however, is that while he was an advocate of many modernist ideals including the need for a new city-building mechanism, Doxiadis had the benefit of practicing mostly in a post-CIAM world. He had witnessed the failures of many early modernist projects. He had studied them as they materialized, and he had observed the public's reaction to and criticism of them. Their limitations had been subject to extreme scrutiny, and he aimed to rectify them in his proposals. In particular, he rejected the tabula rasa approach engrained in many early modernist utopias.[45] He understood public skepticism of the view that the city of the future could only be materialized through the demolition of the past. And in his speeches and writing he noted how such an attitude had become particularly associated with the failed urban renewal projects of the 1940s, 50s and 60s.

Nevertheless, those wanting to maintain their hope for a better future, free from the cluttered inefficiency and outdated forms of the past, still had to provide an answer to this underlying critique of the larger modernist project. In theory, at least, the work of DA was therefore premised on a commitment to protecting existing cities and conserving their older parts. And Doxiadis made many claims about understanding the positive values they embodied. In particular, as he wrote, "Cities of the past offered a more humane life than the cities of the present and a much better chance for man to be happy and to survive as a member of a society" (Doxiadis 1966). Thus, while the projects of DA were typically based on the construction of new, modern neighborhoods, Doxiadis also argued in theory that this should not come at the expense of older areas of urban fabric.

While Doxiadis was indeed a believer in many of the ideals of modernism, he typically adopted certain basic positions but also sought to significantly develop them. He thus attempted to

[45] In general, early modernists believed that building the future entailed the elimination of the past. For instance, Le Corbusier's ideas for the contemporary city and plans for Algiers provided perhaps the starkest embodiment of these ideas. For him, older cities that emerged through time as the result of many individual decisions were a thing of the past. Such cities could no longer be adapted to the needs of the present. However, such proposals typically assumed the application of state power to erase many people's private pasts in order to build a new common future. Lluís Sert's work, such as his plan for Habana Vieja, exhibited similar characteristics. Had his plans been implemented in the Cuban capital, much of the city's older fabric would have been destroyed to make room for new, modern development.

negotiate two contradictory trends — to remain loyal to modernist ideas and agendas, while at the same time acknowledging their practical limitations. In effect, he abandoned some older modernist approaches, manipulated others, and advanced some others in an effort to create a new version of modernism. In a plan such as that for Riyadh, he was thus seeking to cultivate a different image and reputation that would allow the positive qualities of modernism to be retained while avoiding its growing stigma. Doxiadis's position was thus much more complex and multilayered than that accorded him by critics who dismiss him in a reductionist manner as a "typical modernist."

Nevertheless, the practical implementation of his complex positions and ideals presented challenges due to their potential contradictions. In the case of the Riyadh plan, such difficulties became apparent as early as 1969. On December 29 and 30 of that year, two meetings took place between representatives of DA and a Saudi delegation from the Town Planning Office comprised of Saud Linjawi (TPO's town planner), Abdelaziz Samkari (TPO's communication officer), and George Swidan, a TPO consultant. The agenda for both meetings concerned three main issues: the logistics of implementing the master plan, Riyadh's existing and proposed building regulations, and the postponement of certain pending developments located in areas to be affected by the DA plan.

Records of the meetings reveal that with regard to the first agenda item, the Saudis were particularly hesitant to execute some of DA's proposals for the widening of road rights-of-way in older parts of the town. Their concern was that the proposed new widths would irreparably damage its fabric. Linjawi and Samkari in particular expressed concern that Doxiadis's alignments would "destroy a quite big number of buildings," and they proposed reducing them to preserve as much of the built fabric as possible from bulldozers. It was not the first time the TPO had expressed such a concern, but their previous entreaties that DA be sensitive to the old town had been of no avail. And once again, at this meeting, the DA team explained that vehicle access and efficient circulation needed to be top priorities As they argued, "We cannot only plan new areas, but should also ameliorate and organize the already existing city, to serve better the present and the future traffic needs."

What becomes clear as a result of such meetings is that despite their words of admiration and calls for conserving the cultural values embodied by the old town, neither Doxiadis nor the DA team prioritized the its preservation. Indeed, in their practice in Riyadh and elsewhere, old towns were rarely seen as consistent with a functional future city. This prioritization of a universal model despite all the evidence of local concern was perhaps the core contradiction underlying Doxiadis's project in Riyadh. While concern for local character might have been a feature of Doxiadis's theoretical writings, and while DAs professional reports were filled with an appreciation of existing cities, his projects rarely reflected this in practice. His approach instead relied on the application of a generic system with some minor modifications based on an abstraction of certain convenient principles drawn from the local context.

Doxiadis's future city — be it Riyadh, Baghdad, Islamabad, or elsewhere — was thus not conceived as a response to what already existed in place. Remnants of an old town might be allowed to remain, but the intention was to preserve them in isolation as evidence of a past world. The actual city of the future, where life would happen, would be created as an expanse of universal parts extending far beyond the limits of the old world. Thus a series of generic features were common in all his projects — an extensive road network, an ever-expandable grid, a hierarchy of community forms, and a linear commercial growth pattern. And to ensure such a future, as Joyce

Hsiang (2010) has observed, the style of the master plan was "dry and factual, appeared to operate by pragmatic necessity with little use of the active voice."

Upon gaining any new commission, a DA team would spend most of their early effort generating local information on which to build their proposals. And in their public pronouncements they would advocate for the preservation of old areas of urban fabric as an asset for the future. But where the specific evidence of that research conflicted with the workings of Doxiadis's theories of ekistics and the Dynapolis, it was largely ignored. Although old cities might have been more humane, and although an abstraction of some of the qualities that made them this way might inform the design of a better universal urban model, there was little room for local specificity when it came to creating the efficient machine that would be the city of the future.

How can we balance these different views? How can one account for Doxiadis's simultaneous belief in the importance of old towns and local data while at the same time seeking to apply a universal model? Undoubtedly, the desire to implement a universal model did not develop by chance. Doxiadis's ideals emerged due to various experiences he had during his life. On account of these, he came to expect that developing nations would soon thrive and attain a status similar to that of the already developed world. If they did, Doxiadis thought, their local contexts would converge with those of the developed West, and one optimal model would be applicable everywhere. It is in this sense that Bromley (2005) labeled Doxiadis a global optimist.

As indicated in Chapter 3, Doxiadis had also begun his professional career at a time when the most pressing concern was how to respond to the widespread destruction of European cities as a result of World War II. This was soon followed by what many perceived to be a worldwide population explosion and its inevitable corollary, global urbanization. In the face of such crises, what was needed was a new, rapid, efficient process of city-building. And in response to this challenge, Doxiadis was able to fall back on theories of production he had been exposed to while a student in Germany. Among these were Ernst Neufert's ideas of standardization, which helped lead him to seek to develop a model of urban form that could be constructed anywhere (Doxiadis and Papaiōannou 1974).

A combination of all these experiences led Doxiadis to believe that the appropriate answer to the problem of cities worldwide was a universal model that bypassed the need for an individual design for every site. Such an approach also accorded with his belief in the rationalization of the design process, which might allow it to be conducted under ideal conditions in a lab by experts. Such a model of practice might also guard planning against the failures of the past, and it would protect it against both the artistic impulses of the architect and the selfish motivations of the politician.

F. Orientalism

The view presented above provides a standard explanation of the contradictions in Doxiadis's work as seen from within the traditions from which it emerged. But today, it is also possible to view these from outside the Eurocentric perspective according to which design activities were largely evaluated during Doxiadis's lifetime. From what might be called the global South, it is thus possible to use the framework of Said's Orientalism to understand the inherent contradictions in

the Riyadh plan and Doxiadis's work generally. An Orientalist perspective was common among Western scholars and practitioners dealing with the Middle East (and the developing world generally) at the time. And through this lens, it is possible to see how Doxiadis considered non-Western contexts not as places to engage with directly, but as spaces in which to apply theories and convictions developed elsewhere. As an extension of colonial practices of urbanism, locales such as Riyadh were where the principles of a universal city of the future, devised as theory, might be applied and perhaps further developed.

As mentioned in Chapter 2, when it was published in 1978, Edward Said's book *Orientalism* created a turning point for a variety of scholarly efforts to understand the relationship between the West and the Middle East.[46] According to Said, Orientalism involves "a style of thought based upon an ontological and epistemological distinction made between the orient [the East] and (most of the time) the occident [the West]." And his book represented an attempt to understand why people, especially in the West, have predetermined opinions and judgments on the Middle East: about who lives in the region, what their beliefs are, and how they typically behave. As Said argued, people may adopt certain stereotypical ideas about the region and its inhabitants even if they have never visited it or met anyone from it. Yet he asserted that these views were a product of a process of knowledge accumulation that is neither subjective nor innocent. Orientalism thus provided a lens the West employed when discussing the Middle East that distorts the reality of the region and its people.

In the book, Said eloquently illustrated ways in which a common set of assumptions and myths provides a foundation for various arguments whose purpose is to establish the superiority of Western values. This perspective thus provided a tool of political supremacy and a way to assert the authority of one region and culture over another as a matter of natural fact. From an Orientalist perspective, few regional characteristics were logical and consistent; yet, typically, the Western voice would be present and clear. This condition allowed the West to speak for the Orient, while Oriental subjects were considered voiceless. As such, the Orient might be treated as a place where things happen, not as a place that could be intellectually engaged with and understood. It might also be portrayed as uncivilized — a timeless place where the Western teleology of progress did not apply. This framing, in turn, allowed the Orientalist to be portrayed as a savior, whose very purpose might legitimately be to rescue a backward population.

Such ideas can shed considerable light on Doxiadis's motives and ideals and on certain positions he took in the creation of the Riyadh plan. They also provide another possible explanation for its contradictory aspects. For example, Said pointed out that a typical Orientalist attitude was to ignore differences that exist within an Oriental population; simply being defined as from the region overrides all other differences that might exist. Doxiadis and his team adopted just such a view when discussing the Saudi society. Indeed, one of their reports made it clear that "Saudi society is characterized by a great degree of uniformity and homogeneity as far as socio-cultural traits, characteristics, and activities go" (Doxiadis Associates 1968a). Such statements ignored the

[46] Said's work was monumental in almost all fields of humanities and for every scholar who dealt with the Middle East. Urban scholarship on the Middle East in particular has been heavily influenced by the book. Said transformed it to emphasize more context-sensitive analyses that considered the varying nature of urban development. "The doctrine of the Orientalists concerning the Muslim city and Muslim town planning fits naturally into the fundamental concept of Orientalism," Andre Raymond (1994) subsequently pointed out. And Janet Abu-Lughod (1987) forcefully employed Said's framework to critique Orientalist approaches to the Muslim city, pointing out its inadequacy as a general category.

existing and obvious diversity within the Saudi context, with many different regions, cultures, cities, and norms.

Another Orientalist characteristic evident in Doxiadis approach involved his view of the population of Riyadh (and other developing places where he was involved) as passive recipients of a plan instead of active collaborators in its production. Conceived as lifeless objects rather than dynamic actors, the local population might thus be considered without distinct agency to express their needs and desires regarding the character of the future city. Instead, they were generally treated in the abstract as a numerical entity.

Apropos of such an approach (and as a mechanism for sound planning in developing contexts more generally), Doxiadis wrote, "requirements will remain vague unless we can express human needs in very specific terms and measure them." It was therefore necessary that a planner transform emotions, needs, and cultural characteristics into "hard measurable data" (Doxiadis 1966). Panayiota Pyla noticed a similar characteristic with regard to Doxiadis's work in Baghdad — namely, his gesture of attempting to recreate local "gossip squares." According to Pyla, the attempt to include such an element in an urban plan for the city "catered more to an Orientalist nostalgia than any profound understanding of Iraq's public life, the intense heterogeneity of its society, or its aspirations to modernity" (Pyla 2008).

Middleton (2009, p.125), too, noted that "throughout the master plan there is a glaring omission of a development focus on identity formation, and social and public places for the city, and the formation of a spatial capital image and identity. There is no consideration of familial social life within the design strategies, which may reflect preconceptions of the society or an absence of knowledge specific to the social and cultural context of Saudi Arabian life."

Contextualizing Doxiadis's emphasis on scientific neutrality and dependency on data analysis through the lens of Orientalism can cast the qualities of much of Doxiadis's appeal at the time in a different light. His legitimacy as a planner derived from positioning himself as a scientific practitioner, whose plans gained legitimacy from being the neutral and logical result of advanced scientific methods and analysis, which only he could perform. In the many discussions with the Saudis, as in the documents delivered, the DA team thus heavily emphasized science as a method and repeatedly claimed the plan would not be biased or subjective. However, a further unpacking of the methods and tools employed by the team reveals that these were little different from those being employed at the time by other urban planning professionals. (Doxiadis Associates 1970d; Doxiadis Associates 1968). Surveys, modeling, and algorithms were all part of what Doxiadis presented as his competitive advantage, his exceptional method. But in reality, they were not unique; indeed, their use was becoming increasingly widespread. Yet, by framing these claims through an Orientalist lens, it becomes apparent that what the Greek urbanist and his team were really trying to do was convince their local clients that they were bringing a civilizing tool. According to that dynamic, the Saudis, as a backward population, were in need of saving, and Doxiadis, the Western expert, would use the instrument of scientific planning to rescue them. This explains his choice to position himself as a scientific planner who was advanced and exceptional, even though the particulars of his endeavors had no special claim to being either.

The Orientalist quality of Doxiadis's approach to the Riyadh project becomes even clearer in incidents and interactions involving local Saudi officials. Thus, in discussing local zoning laws and building regulations, and following the advice of the Saudis, the DA team initially agreed to hire a specialist in Islamic law and a number of lawyers from Riyadh as consultants. Such a

proposal added legitimacy to their initial bid, because it displayed an interest in the possibility that local experts might be able to advise the team on how better to adapt their proposals to the particularity of the Saudi context. Yet, despite such feigned respect for local culture, no record exists of such a collaboration ever taking place.

It is further remarkable that while the DA team continually emphasized the importance of local data and perspectives, none of its Saudi members participated in the design process. To comply with a request from Saudi authorities that was part of the contract for the work, the DA team did agree to train Saudis as interns in their office in Athens. But the important parts of the project were completely handled by foreigners, and the Saudi nationals who worked on it were limited to bureaucratic tasks and observation without participation.

One source interviewed for this dissertation shed light on just how little regard the Greek team held for local knowledge and in-depth familiarity with cultural context. The interviewee was an architect who worked with DA for some time during the 1970s, not as part of the team involved in the Riyadh master plan but on other projects in the country. Being a Saudi, he was tasked with conducting interviews with the local population of different cities because it was felt he could make a better connection with them. However, he stated that his participation was regarded more as a spectacle than actual involvement. The fact that Saudis were able to see and interact with him was thus presented as evidence of the firm's local sensitivity. To the DA effort, this was more important than any information he might be able to gather that might better ground the work. Needless to say, he was never allowed to handle technical work during his tenure with the firm.

The Orientalist aspect of Doxiadis's attitudes was nowhere more evident than in his proposals for Riyadh's old town. In the many reports produced for the Saudis, the DA team often highlighted its importance, and their view that its historic character should be central to future proposals for the city. For example, according to the master plan report, "Every city has its architectural style and character, and Riyadh has its own character. One cannot ignore the existing pattern in the town." It further suggested that "the task of the future is to respect the old town and build a new environment that is in harmony with it" (Doxiadis Associates 1971). However, many other words and expressions in the document reveal a very different attitude — one picturing a rigid dichotomy between the old city's backwardness and the new, modern neighborhoods the team proposed to establish all around it.

The intellectual frame of Orientalism helps illuminate why the DA team would seek to both praise and disparage the built character of Riyadh's old center. Such a conflicting attitude signaled that these older areas had little functional significance as a precedent for the newer parts of the city. Yet by labeling them as backward while praising their quality, the DA team was able to establish a clear separation between the old town and the new city while avoiding the question of whether these areas could provide any lessons, positive or negative, for the future. It was as if those old parts were simply not a viable object of analysis with regard to the future. Such a view was in line with the Orientalist attitude of not engaging with local frames of judgment, but seeking to impose values from outside. From this perspective the old town could simply be treated as an ornament, an object, an artifact that could be viewed as an exotic production.

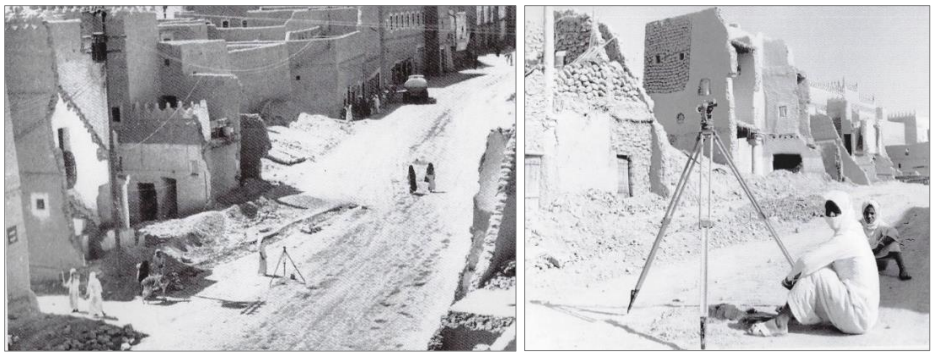

Fig. 5-6: Road construction and widening efforts in Riyadh's old parts. Source: Doxiadis Archives

The proposals and plans included in the final master plan report reveal how insignificant the old city was to its vision of Riyadh's future logic and morphology. Large parts of older neighborhoods were destroyed to make way for new segments of a proposed comprehensive circulation network that would cut heartlessly through the old fabric. Other streets would be widened to allow them to serve the future needs of automobiles (Fig. 5-6). And nothing would be learned from what remained standing from this brutal process in terms of the functioning of Riyadh in the year 2000. New neighborhoods would not be built on similar foundations nor as an extension of their logic. Nor would the cultural principles evident in the old city influence the formation of the new one in any meaningful way. To the contrary, Doxiadis's ideal city would be built in a completely different, universal style, one derived from Western precedents.

In general, the view that appears from the document is that Doxiadis and his team valued the old parts of the city solely on the basis of aesthetics. One area of the report thus pointed out how, "The old central area in the city has a substantial beautification value. Its character that reflects historical and culturally rich heritage makes a valuable asset that needs to be preserved." As the report further explained, "while we need to preserve ancient buildings and sites with historical value located inside the central area like the old fort and palaces with plazas through maintaining it and showcase their view, we should also move the functions of the city, governmental agencies, and commercial activities away" (Doxiadis Associates 1971).

Just like a museum, the old city should be preserved to be looked at, not lived in. Indeed, in a letter sent from the DA office in Riyadh to its Athens headquarters, one team member explained how this proposal had been extremely satisfying to the mayor. According to the letter, the mayor "liked the idea that I brought up for reconstruction of the old part of the city with the walls, turning it into a museum." (Doxiadis Associates, 1968c).

G. Strengths of the Plan: An Alternative Perspective

Considering the many shortcomings noted in the previous sections, one might logically conclude that the DA plan for Riyadh would have long ago been relegated to history. However, one of its most surprising outcomes in retrospect is how it has continued to play a critical role in shaping

Riyadh's growth trajectory. Despite differing views of its utility and the negative image long associated with it, the legacy of the DA plan may today be seen not only in the present city's "older" parts (those constructed around the time of the plan's implementation in the 1970s and 1980s) but also in much more recently developed areas. The question that thus emerges is, why, despite its many limitations and the volume of criticism directed at it, has the plan not been abandoned?

The continuing relevance of the DA plan is especially puzzling since several subsequent plans have been commissioned precisely to "imagine a new future for Riyadh." As mentioned, these have included the SCET plan commissioned shortly after the DA team departed Riyadh and the regional MEDSTAR effort undertaken in 2008. This residual importance is further bewildering considering that Doxiadis and his team were assigned to imagine the future of Riyadh only through the year 2000, after which it was assumed that the city would have moved well beyond its framework. Yet as late as 2020, aside from a few updates and the alteration of its top-view details, the city had not been able to escape Doxiadis's influence. Subsequent plans have not only failed to break with the logic he constructed, but they have also largely chosen to operate in their own way within the mechanisms he created. Doxiadis's continuing influence on the city's development must therefore indicate that the views presented to this point do not fully capture its role and significance, and that an alternative reading is essential.

The major problem with current discourse in terms of explaining the phenomenon of the 1972 plan is that it reads Doxiadis's approach to planning as being similar to the standard view of other practitioners. This typically assumes that the role of a master plan is to provide a comprehensive picture of what a city should look like at a future time: its physical size, the location of its major components, the density of its residential areas, the heights of its buildings, and other physical attributes. Historically, this has been the intent of most traditional master plans — from Hausmann's famous efforts in Paris, to Cerda's project for Barcelona, to Burnham in Chicago, to Abercrombie in London. The same was true of professional planning efforts that occurred elsewhere in the Gulf region at the time Doxiadis was working in Riyadh — such as Munro in Bahrain, Buchannan in Kuwait, and Harris in Dubai. All these efforts produced master plans that envisioned the creation of a particular future physical environment. And because most professional urbanists employ this perspective, they have overlooked other complicated layers embedded in the Riyadh master plan. Regardless of point of view, most scholars therefore examine the Riyadh plan based on the expectation that it too was intended to produce a particular physical creation.[47] Thus, their analyses go no deeper than seeking to evaluate whether its particular recommendations were carried out, and in this regard, they find it easy to point out its shortcomings.

However, as must be clear by now from the discussion in previous chapters about his ideals and background, Doxiadis's approach to the work in Riyadh was more complex than simply seeking to provide a particular new physical image for the city. Indeed, Doxiadis often argued enthusiastically against a purely physical approach to planning. For instance, he explained that the

[47] Joyce Hsiang's 2010 article "The Doxiadis Effect," despite being short, is the only work I have seen which has discussed Doxiadis's work as a process and framework. It investigates the project as a physical plan, but includes in some aspects discussions on it as process in place. However, because it is extremely constrained by the length, her article is unable to thoroughly discuss this aspect. Instead of offering a deep analysis, it only explores this element briefly in through the course of several paragraphs. For instance, she writes that "more salient than the accuracy of population figures or the physical presence of the grid are the reverberations of the Doxiadis effect upon Riyadh's planning process."

failure of urban renewal projects in the 1940s, 50s and 60s came precisely because planners dedicated too much attention to physical structures. As he asserted, “the conception of urban renewal was confined to the achievement of physical urban renewal, but if we remodel a community we must set an ideal of life within it, if the redevelopment of the community is our goal, we should not limit ourselves to physical renewal” (Doxiadis 1968).

Beyond existing attempts to evaluate its legacy, the enduring relevance of the project would thus seem to demand a fundamentally different interpretation (Fig. 5-7). Doxiadis did indeed design a typical physical structure for Riyadh based on his efforts to create a global model for urban development. And it is clear in retrospect that the project encompassed assumptions and predictions that were rapidly rendered obsolete by events, and that some of these had catastrophic bearings on the plan’s effectiveness. Correspondingly, critics have also reasoned that, simply because the plan was based on incorrect estimates and contained contradictory provisions, the entire product must have been flawed. Yet as the city has expanded far beyond the physical boundaries imagined in 1972, the plan has remained relevant because it incorporated flexible mechanisms and assumptions that Doxiadis developed for general application throughout the body of his work. The continued relevance of the plan across a vast expanse of urban terrain cannot be understood in isolation from the contextualization of these elements.

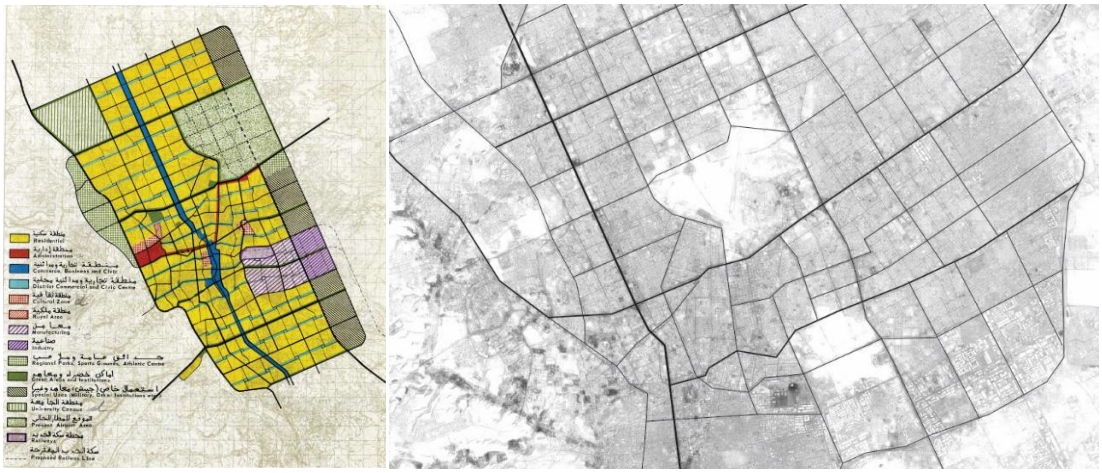

Fig. 5-7: Left: Doxiadis’ physical design. Source: Doxiadis Associates (1971) DOX-SAU-A18. Right: Riyadh’s actual territorial expansion. Source: author.

Ultimately, this indicates that the project’s true strength and endurance derives from Doxiadis’s ability to understand the purpose of a master plan in a different way. Central to this vision was the notion that planning was an open-ended process rather than one pointed toward a desired endpoint. Doxiadis explained this attitude by saying that his plans were different because they served a symbolic as well as practical purpose. However, such a view was often in conflict with the fact that “[the] professions from which most planners begin are professions which express themselves in drawings, [and this] helps plans to acquire in the minds of people much more importance than goals, policies, and programs.” As he saw it, “this . . . constitutes a great danger, since plans are normally nothing but a three-dimensional projection of the substance of human settlements” (Doxiadis 1968).

For Doxiadis, therefore, a plan was not a physical product, but a dynamic one intended to introduce mechanisms and processes to direct the forces of growth beyond the physicality of place. In this regard his great legacy in Riyadh was to break away from notions of time and space to construct a dynamic growth model, unleashing a process that would allow the city to grow and expand indefinitely, beyond the physical boundaries his plan presumed to draw. “The plan must reflect the adaptability demanded by the factor of time,” noted Doxiadis. In addition to allowing it to stand up to unexpected forces, this approach “pushes the city development forward [to meet] all of its needs in every stage of its development” (Doxiadis Associates 1971). To him, particular forms of specific dimensions held no ultimate value. A planner’s role was not to physically design a city, but to define parameters that would help guide a city into an unpredictable future. This vision of the project was what was initially appealing to the Saudis, and why it has remained relevant and forceful. This “symbolic” aspect is also the one that most accounts overlook in evaluating the DA plan’s role in guiding the city’s growth.

A revealing interaction, which occurred in a previously mentioned series of meetings held between July 31 and August 2, 1969, illustrates the importance of this aspect of the plan (Doxiadis Associates 1969c). As mentioned, these meetings resulted from the visit of a delegation of Saudi government officials and consultants to Athens to discuss aspects of the plan and its implementation with members of the DA team (Fig. 5-8). Some of the exchanges at the time also illustrated Doxiadis’s larger ideals and thinking about it. Among these was his belief in a dynamic city that could be materialized only through frameworks and processes rather than in pursuit of a detailed vision of future form. The discussions also revealed the role these notions played in influencing the Saudis determination to follow this path regardless of difficult demands and problematic assumptions. In fact, the interactions revealed that the very qualities of flexibility and adaptability were the main characteristics of the DA plan that appealed to the Saudi officials. They saw these as a forceful characteristic that would increase its eventual effectiveness, despite its potential shortcomings in other areas. They believed that the city needed a framework to guide its growth, and that this was more important than realizing any particular physical form in the future.

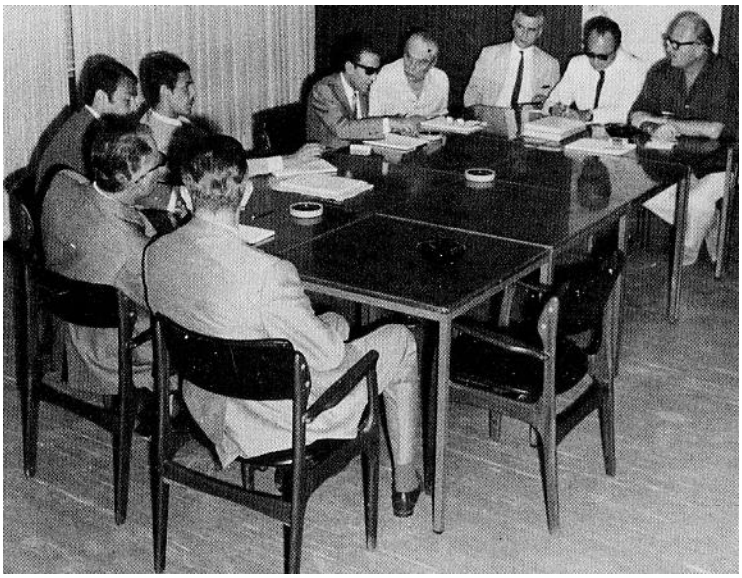

Fig. 5-8: A picture from the visit of Saudi officials to the DA office in Athens. Shown from left to right: J. Frantzeskakis, S. Chatiras, Eng. Rassem Shaath, Dr. Omar Azzam, Deputy Minister Abdullah Al Sudairy, C. A. Doxiadis, C. Antahopoulos, N. Efessios, A. Tsitsis. Source: *Doxiadis Associates Review*, 1969.

Prior to their trip, the members of the Saudi delegation had met with relevant governmental agencies and presented a preliminary version of the master plan to them with the goal of collecting as much feedback on it as possible from different viewpoints. This feedback varied widely, and as described earlier, concern was raised over aspects of the future road network in the old parts of the city. However, a second major concern involved the DA team's predictions for the city's future growth.[48] Initially, both the Central Planning Organization and the Central Statistical Department questioned some of DA's estimates, focusing mostly on economic statistics and mentioning issues such as the gross national product and municipal budgets. But Saud Lingawi subsequently reported that both the Ministry of Finance and the Central Statistical Department had doubts about DA's estimates for the city's demographic and physical growth. Specifically, they believed that DA had used an extremely conservative prediction of future population increases, and they were unsure that the development parameters that resulted from this would be adequate.

Dr. Omar Azzam, who was the head town planner at the TPO and a direct consultant to the king, was acting as a chief negotiator between the Saudi delegation and the DA team. And throughout the meeting, his aim was to guide the discussion toward a middle ground that would be satisfactory to both parties so that the project could move forward. However, Dr. Azzam also made it clear that, as one of the main officials in charge of the project from the Saudi side, he valued the flexibility of the plan above all other aspects. He acknowledged that the government agencies had raised valid points in their comments. And he explained that there was a great possibility that the DA team's data and assumptions might not be accurate, and that the plan's structure might not be perfect. However, per the meeting's minutes, Dr. Azzam urged all in attendance to focus more on the plan as a framework, and he argued that the inaccuracy of the report's predictions "does not really matter so much." Instead, he suggested that the plan's main role would be as an adaptable instrument that might be applied to many possible future situations. Hence, any present inaccuracies would be of little importance because the plan would be able to adapt to them. Its inherent flexibility would allow it to remain functional and effective despite imprecise assumptions. In his response, Dr. Azzam thus emphasized the role of the plan as a guide, and he asserted that its physical components were of secondary value.

The following comments taken from the meetings' records, as reported by DA, describe this Saudi viewpoint, as conveyed by Dr. Azzam:

> *What was more significant [than the predictions and data] is the fact that the structure of the master plan, as proposed by the consultant, is dynamic and allows for a physical development by stages according to the economic and population*

[48] The comments conveyed by the Saudi delegate included a number of different issues. Beside the previously discussed issues of conservative estimates and challenges of implementing the road network, other issues included housing, the project's proposed interference with the construction sector, a lack of water resources and the cost of water provision for Riyadh considering the scope of the plan, standards of community services, and the coordination necessary between the plan's committee and other agencies involved in each service.

potential of the capital either within the frame of the proposed plan, or even beyond in the future [emphasis added].

Following some discussions on the matter, it was assessed that the physical plan of the city, as prepared and structured, can accommodate without damage to its structure and workability, a fluctuating size of population in the various target years and development stages that are being considered.

In another discussion, Dr. Azzam suggested that, in future reports, the dynamic flexibility of the plan should be stressed even more, as it constitutes by itself an answer to many problems. He and Mr. Doxiadis commenting on the same subject, indicated that the growth of the city should be shown at various stages by the use of small sketches and drafts, clarifying to the minds of everybody the steps which it is anticipated to undergo. This should answer many comments by different individuals and satisfy them.

Such an understanding of the plan should not be considered in isolation. But as the discussions at this series of meetings reveal, it was a deliberate feature built into the plan, and did not occur by coincidence or an accident. Doxiadis deliberately devised a framework for the growth of Riyadh that did not depend on exact parameters. Rather, his intent was to create a process that would be both flexible and adaptable. This was also the reason the plan was attractive to the Saudis. They believed what was ultimately most important was that it be adaptable enough to create the conditions for a truly dynamic pattern of growth. This characteristic has provided the key to its continuing relevance despite its many clear limitations. It is also the reason for its enduring quality despite its many inadequacies.

What Doxiadis hoped to produce as a result of the Riyadh planning process was a framework that could adapt to changing circumstances and challenges. He imagined this as guiding the growth of a dynamic, yet rational city that might expand indefinitely according to a consistent logic. Treating the city as a living creature, what Doxiadis provided for city officials were the ingredients needed to guide the city's future growth, which would happen regardless of the mix between these ingredients and the precise location where they are applied. This attitude explains why, as described earlier, the master plan did not mention a particular future physical design for Riyadh until page 125 of the 172-page final report. This concern was secondary to the DA team's effort to establish a process and networks for the future development of the city.[49]

In that final master plan report, DA expressed confidence that Riyadh would ultimately experience many qualitative and quantitative transformations. Hence they contended, "it is necessary to develop a framework that is able to grow and connect different kinds and levels of functions in an organized and orderly manner, and is able to absorb both the anticipated and the unexpected transformation from now. This is what Riyadh needs first and foremost to solve its current and future problems" (Doxiadis Associates 1971). To that end, the team proposed a number of adaptable spatial tools. These would allow the city to withstand "unexpected" aspects of this transformation, because they could be applied across a number of different scenarios and the construction of different urban elements at a variety of possible sites. In line with Doxiadis's beliefs, the plan was imagined as being adaptable and applicable across both time and space. It

[49] See discussions in Chapter 2 for more on the plan's emphasis on process and formulas and the scarcity of physical design.

was imagined as an instrument that could just as easily serve a city of 500 citizens as one of 5 million.

Several aspects of DA's work for the city were instrumental in producing this outcome. For instance, one of the documents that the DA team produced for the Saudis prior to submitting the final master plan report contained the required legislative framework for Riyadh to implement a new framework of zoning laws and building codes. However, in the document's introduction the team made it clear how this process ought to evolve. This reads that "legislation should be flexible, development programs and plans must be flexible as conditions change with time." As it then added, "thus, the corresponding legal framework should provide the means for the realization of such changes when required" (Doxiadis Associates 1970b). Such an approach is one reason why many of the processes the DA plan initiated have been able to adapt to numerous changes since their inception, and why they continue to be a primary driving force for how Riyadh has grown and expanded (Fig. 5-9).

Fig. 5-9: The Riyadh grid's infinite applicability. Source: Google Maps.

Another example of the plan's adaptable growth instruments were the precise ratios it included for the relationship of particular typologies, densities, heights, and setbacks. These were not intended to be absolute measures but were meant to be interpreted based on proximity and relationship to certain key urban elements. Thus they were intended less as establishing hard limits but as parameters to direct the growth and shape the city's future in an a variety of possible future directions or shapes. "The suggested pattern should be open-ended," the team's report read, "it should allow the city to grow as much as the population increases."

The plan was also intended to establish a modular structure to the relations within every superblock, which could be used to create neighborhoods within the plan's determined limits — or future ones beyond its boundaries. Additionally, despite the fact the design of the block itself went through dramatic changes through time, the logic behind it remained forceful. This aspect has been pointed out by Hsiang (2010), who wrote that "the grid's physical nature was secondary to the final report's emphasis on the methods that the grid enabled." This 2 km x 2 km grid of

superblocks created a pattern by which the city could be extended endlessly through a replication of units, regardless of the direction or location, yet at the same time creating a mechanism to ensure a hierarchy of streets, communities, services, and other elements.

Despite being extremely detailed in certain respects, the plan was also intended to be vague in other areas, leaving room for interpretation. Although this vagueness might be viewed negatively in commentaries on more traditional plans, in Riyadh it proved beneficial. Because so much of the future of the city could not be predicted at the time the plan was being produced, such an approach has turned out to be one of the reasons it has been able to adapt and remain relevant. Doxiadis's team thus laid out only the general framework for how the city should be developed.

However, despite the flexibility, the plan included certain principles DA believed in very strongly, such as their specific descriptions of the limits and characteristics of superblocks and the length and hierarchical character of streets. As a result, they fought hard for certain features of the plan and were not willing to compromise on them at all. For instance, in a meeting on March 29, 1970, representatives of the municipality informed the DA team that they had decided to reduce the planned new width of Khazan Street because of practical difficulties encountered in the process of land acquisition. The team argued back against this move, enthusiastically pointing to estimates of future vehicle ownership in the city and other projections. And when the DA team was unable to change the minds of the Saudi officials involved, they still refused to compromise. Thus, as DA documents from the meetings reveal, a memorandum describing the new design "was not signed by the consultant, being [the consultants] in disagreement with their [Saudis] decisions" (Doxiadis Associates 1970c).

By contrast, other features of the plan were left ambiguous, perhaps purposely, because they were aspects the team felt indifferent about. Thus, in practice and through the many years, some elements of the plan have been read, interpreted, and applied in a very different manner depending on the demands of the situation. Such an adaptable and flexible outcome could only have been enabled by vagueness in these aspects. It would be hard for an agency to directly contradict something that was clearly stated in the plan, even though the situation it pertained to may have changed considerably. But because certain statements in the plan are vague, they may be interpreted in different ways that allow their overall frame of intent to be maintained.

One excellent example of this is the description of "a neighborhood center." The way the plan is written leaves this idea open for interpretation (Fig. 5-10). Such centers thus have taken a number of different forms in different blocks across Riyadh. In one instance it may be an open space, a civic space, or a religious space. But in others it may be a recreational space, a transportation hub, or a mix of a number of these elements. Despite the space allocated to these areas being configured identically across the plan, such a vague definition has allowed their use and purpose to be realized differently based on location and the demands of the time. All these variations typically thus accord with the idea of a neighborhood center — they just represent different ways to realize it.

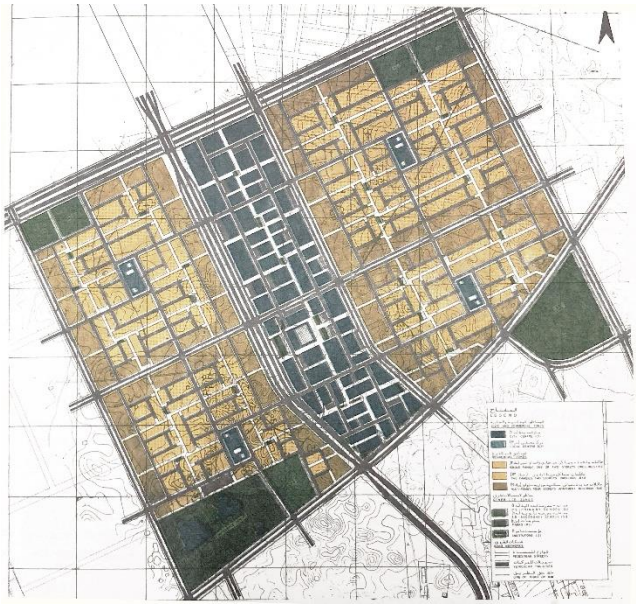

Fig. 5-10: The Olaya Action Plan presents a scheme with four neighborhood centers, but no details are provided to detail exactly what features or characteristics these will contain. Source: Constantinos A. Doxiadis Archives.

Another example of this quality of vagueness is the section of the plan dedicated to the preservation of the city's unique architectural style. Even though this section laid out a number of general mechanisms to retain the existing style, it never clarified exactly what the nature of this style was. What constitutes Riyadh's unique architectural style? The report did not call out certain elements, explain their value, or provide reasons for their preservation. Nor did it point out distinct structures or areas of the city to conserve and protect. Rather, the call was abstract and ambiguous. Thus different architectural styles have been preserved and celebrated at different times, depending on the exact situation. A single building could thus be highlighted in one decade, while being completely neglected in another, but the argument could be made that both situations were "according to the plan."

While some may argue that such wide room for interpretation is a major reason for the weakness of the plan as a tool to produce a certain preconceived notion of the future form of the city, it might likewise be argued that the primary reason for the plan's lasting influence is that there was never a pressing need to move beyond it to establish a new general frame for development. Different times and different situations could sometimes produce contradictory actions. But as a general frame for growth the DA plan could be adapted to different needs by reading the same statements in it in a different manner. This meant that the plan remained a living document. It could always be reinterpreted by local agencies to serve new purposes while its general framework remained intact.

Furthermore, one would be remiss to overlook the institutional ecosystem that created a clear barrier to the successful implementation of the plan — one that Doxiadis was unable to control. Perhaps the principal fault one can attribute to the work of the Greek is that, throughout the planning process, there was little discussion of the required institutions to drive the plan proposals and make sure they were successfully implemented. Nevertheless, during the time that

DA was working on and delivering its plan, Saudi Arabia was a country going through massive transformation and development. Its rate of urban growth was intense and rapid, and despite the many good-faith efforts that were taken to build the necessary institutional capabilities to implement such a sophisticated master plan, the ongoing scale of development greatly exceeded the country's institutional capabilities (for more, refer to Chapter 1, section A). The Saudi government had created a Directorate of Municipality in the Ministry of the Interior in 1953, which was upgraded in 1962 to a Department of Municipal Affairs. And this was in turn transformed into a separate ministry, MOMRA (the Ministry of Municipal and Rural Affairs), in 1975. Yet at the time Doxiadis was producing his plan, and in the years immediately after it was adopted, there remained a clear gap between the ambitiousness of the plan's vision and the structures of governance and legislative systems needed to implement it, and this had a clear impact on its application.

Furthermore, in the decades following Doxiadis's departure, the legislative gap remained and perhaps increased in some respects. Even with the creation of the above-mentioned institutions, there was a lack of clear governance structures and a confusion in the assignment of responsibilities within official urban development fields. Thus not only were institutional capabilities not deep or strong enough to implement such a plan, but the institutional environment was overly complex and ambiguous when it came to delegating the authority to do so.

There were a number of individuals and institutions with a remit that extended into the delivery of the plan. The region's *amir* (loosely translatable as governor) chaired a body that was, in theory, the administrative head of the city. It was the face of the city and had political power but could exercise little technocratic oversight without providing written mandates. Instead, it was assumed the *amir* represented the king in the city, and his influence tended to operate more within the political domain. Yet at the same time the *amir* served as the chair of many service committees and bodies, and usually directed other service providers through "soft power." Additionally, city services were provided by the municipality, which was in some instances closely connected with the *amir* but in others very distanced. Furthermore, the municipality early on was attached to the Ministry of Interior, the same authority in which the *amir* operated. But later it was separated and placed under MOMRA, which was created to oversee all municipalities in the country. MOMRA's creation thus only added to the complexity of the situation, as it aimed to act on its mandate to play an influential role in the city's development. Its principal argument was that Saudi Arabia was not a federal country, and that decisions should thus be made in a coordinated way on a national level. MOMRA thus claimed the right to manage all cities according to centralized principles rather than delegating authority to the local level. The emergence of these three major administrative structures thus created a complex system in which authorities and responsibilities did not clearly match. (Al-Mobarak 1993; S. A. Al-Hathloul and Anis-ur-Rahmaan 1985; Mubarak 1992)

This ambiguity reached its peak toward the end of Doxiadis's commission, as the government decided to establish a "High Commission" to review and assess the plan. In theory, this was a much-needed step, as it acknowledged the need for a capable institution to guide development under such a complex master plan. However, when this institution later became the ADA (Arriyadh Development Authority) — taking charge of the subsequent planning efforts (SCET and MEDSTAR) — it only created further complexity. What emerged in Riyadh thus was a complex ecosystem of multiple actors, all with similar mandates and authorities, but their own agendas and aspirations, with little delineation of roles and responsibilities, and with a plan that needed a strong hand to be successfully implemented.

The discussion above gives a different sense of how Doxiadis saw the dynamic growth of cities and the role of a master plan as an organizer of that growth. From this point of view, Riyadh was an appropriate project in which to apply those concepts and long-held convictions. And from this point of view, it is clear this was primarily intended to unleash a dynamic process and establish a frame that would organize the urban terrain in a largely open-ended manner. His intent was not to tightly control the physical outcome. A city that could endure the test of time would ultimately need to adapt to changing circumstances. Thus, although it can be argued that many of the specific recommendations of the plan did not materialize in the way they were envisioned, certain important features, such as the transportation grid, community classes, networks and relationships, and the hierarchy of scales, remain embedded in the urban construct of the city. And it is according to these elements that Riyadh continues to grow today. Viewing the project through this lens enables a better understanding of its sophistication and continuing relevance — aspects that are typically overlooked in most analyses.

H. Conclusion

As this chapter has tried to show, despite its pretensions to scientific authority, the DA plan for Riyadh was both a flawed and prescient effort. Its predictions for future growth were inadequate from the start, and processes of real estate speculation unhindered by effective administrative controls created the conditions for a new model of growth premised on leapfrog development connected by commercial strips. Internally, an inconsistent approach to such design features as height limits and setbacks also assured a suburban character quite different from the compact form it proposed. Together, these deficiencies led to it being quickly outpaced as a framework for growth, as a complex and conflicting network of Saudi authorities struggled to keep ahead of the demand for new infrastructure from an exploding urban population.

Many of these developments highlight contradictions in the plan's theoretical underpinnings. It called for human considerations while designing mainly for the automobile; it highlighted the importance of the old town without really incorporating any of the lessons contained in it; and it mentioned the significance of the local climate, topography, and cultural values while largely ignoring these to present a neutral structure without any real connection to place. However, all these central contradictions were aspects of Doxiadis's own personal views, which he managed to reconcile through great optimism for the future of the new cities of developing countries.

Central to these contradictions was the aspiration of Doxiadis to be the figure who could reinvent the heroic image of the modernist master builder in an age that was coming to distrust modernism's universalist claims. The fundamental conflict within Doxiadis's work was thus that it could produce universal forms that would be rational and efficient and yet also reflect the cultures of the contexts in which they were applied. In the end it was not able to do either. If one reads his goal as the creation of an infinitely expandable accretion of human-scaled village-like environments, theoretically based on aspects of traditional Arab residential design, the reality was ultimately sprawling American-styled, auto-dependent suburbia.

Interestingly, this outcome highlights how it may have been the Orientalist aspects of Doxiadis's approach that were the most influential outcome of his plan. By refusing to engage in

a meaningful way with the existing logic of the Saudi built environment he opened the door to the import of Western values. But this may hardly have been surprising because, as I noted in Chapter 2, Orientalist-inspired aspirations related to the developments of Aramco had led Saudis to want to modernize their capital in the first place. And they had chosen Doxiadis to undertake this work because they believed that he and his firm would be most likely to produce the result they desired.

The troubled logic behind the plan, which has been repeatedly noted in critiques, however, has largely ignored the plan's continuing relevance. A more pragmatic approach might have started with the precedent of what already existed and sought to extrapolate it outward in a way that reflected local precedent instead of seeking to impose the outlines of a comprehensive universal form for human settlement. But this might not have succeeded as completely in breaking open the container of the old city and creating a flexible, expansive network for growth. The quality of that growth may not have been perfect; it was not always the most humane; and it may not have resulted in particularly Saudi forms. But at the same time, looking at the half-full part of the glass, it provided a rational frame for the development of the Saudi capital at a much-needed time when growth was intense and rapid, and it has guided the city over the past half century to a point where it is now one of the preeminent urban centers of culture and commerce in the Arab world. It is doubtful if this would have happened if a more backward-looking approach to development, or one premised on a rigid structure of formal or administrative control, had been implemented. It has thus been the 1972 plan's success in creating a dynamic modern city, come what may, that has been its most enduring legacy.

Epilogue

In this dissertation, I have attempted to internally and externally contextualize the DA 1972 plan for Riyadh to obtain a full understanding of how it emerged as the result of multiple influences and reflected the condition of Saudi Arabia and the international planning field at the time. As many have observed with regard to planning projects elsewhere around the world (for example: Al-Nakib 2016; Fuccaro 2009; Mumford 1961), my argument has been that this project for Riyadh did not proceed straightforwardly. Its process was not linear or one-dimensional; nor did it unfold in a vacuum or emerge from a lab. I have attempted to provide this contextualization to facilitate a more advanced, holistic interpretation of the plan and better judge its lasting effects. The plan, contrary to the view of it in much recent scholarship, was arrived at following a complex, multilayered process, and unpacking those layers is essential to full comprehension.

As is common with major planning efforts, the project can be seen in a variety of ways from the perspective of history. Some of the views have been highlighted in the preceding chapters. In addition, the theories of Doxiadis and the professional work of DA that sought to realize them were contradictory in many regards. These contradictions were fully evident in the Riyadh plan. On the one hand, it was premised on a concern for freedom, human scale and values, local architectural styles, local specificity, and the importance of the historic old town of Riyadh. On the other, it proposed a strict geometric order, was premised almost entirely on private automobile use, responded to international rather than local cultural design precedents, attempted to enact a vision for a universal city, and disregarded the many environmental lessons of Riyadh's historical core. How one regards such apparent contradictions may have something to do with the purposes of one's engagement with the plan.

Fig. E-1: Constantinos Doxiadis. Source: internet.

In retrospect, though not commonly invoked, these contradictions are more than evident. And a full appreciation of them may lead to the conclusion that, in this project, Doxiadis succeeded more in his famous ability as a salesman than as a practicing planner. Often admired for his marketing skills, one might even conclude that Doxiadis approached the job of planning Riyadh's future more as a business opportunity than a profound attempt to reshape the city according to deeply researched principles and goals. According to this view, the plan's many contradictions may indicate that the words he used to gain the commission and satisfy the client were largely hollow, that the product was insignificant beyond the delivery of a standard proposal, and that consistency was largely irrelevant. However, as I have tried to show here, there are many indications that this explanation is unlikely. Such a view is contradicted, for example, by the amount of work that the Greek and his team invested in producing the project, his professional approach and background, and the discussions and debates revealed in the archives.

Another possible explanation is that Doxiadis engaged in a well-intentioned effort to realize his plan for the ideal city of the future in his work in Riyadh, but that this very effort was contradictory, or impossible, given its demands. Each specific characteristic of that city, even if it contradicted others, was considered to be a necessary ingredient, and Doxiadis's method implied leaving those contradictions on the table to be resolved later, to the extent necessary, by an organic process of growth and change. Based on my exploration of Doxiadis's background, professional history, ideals, and convictions in this dissertation, this scenario appears probable. And it becomes even more probable when one considers the appalling conditions of urban living across the globe and the situation within the professional urban planning field at the time the Riyadh plan was produced. As a dreamer, thinking and theorizing about urbanity and humanity and possible ways forward, Doxiadis fully embraced the solution to the problem of urban growth he proposed for Riyadh, even if it contained contradictions. And in this sense, he believed that the practices of science would provide the key not only to the new form of urban living but also to the ultimately harmonious accommodation of these contradictions. As he argued, such a new, revolutionary approach was the only way that planners could move beyond the mistakes of the previous decades and regain the public's trust. This explanation is supported by my archival work, which illustrates that even in his internal drafts and written thoughts, Doxiadis assumed that the inconsistencies could be balanced, and that what this effort would create was the answer humankind crucially needed.

Initially, this dissertation returned in time to delve into the internal Saudi context. In Chapter 2 it thus detailed events from decades prior to Doxiadis's arrival that had an influence on the plan he devised for Riyadh. The argument built through the chapter was that Doxiadis did not practice in a vacant land; to the contrary, there was a city and culture established in Riyadh that deflected established sets of values, aspirations, and power dynamics, which all touched the plan. As they concerned images and ideals of a supposedly modern urban environment, many of these influences could be traced back to the role of Aramco in the development of the country over the previous 50 years. While initially operating in Saudi Arabia only as an economic enterprise, through certain subtle practices and systems, this private company soon transformed itself into a larger agency for modernization. Perhaps most critically, it successfully built a picture of a new ideal of urban form associated with the status of modernity, development, and advancement. This image became tangible first through its workers' camps, which contrasted a suburban-like development pattern for expatriate American managers with more crudely styled settlements for local and expat laborers. As these residential environments proliferated, Saudis could at first only observe a modern living condition from a distance. But that image soon spread across Saudi

Arabia, initially through Aramco's media channels and its housing programs, and later through Aramco's construction of the new city of Al Khobar. The physical spread of this vision finally reached Riyadh in the planning of the Al Malaz district, the city's first modern development, which housed government officials relocated from Jeddah. With its gridded design, detached villas, wide plots, and heavy reliance on automobiles, Al Malaz became the epitome of what modern living should look like.

This was the stage that was set for Doxiadis when his team arrived in the city in early 1968. Riyadh was a city with aspirations to modernize and develop, and a clear vision of the physical translation of those aspirations. Furthermore, not only did the image influence the plan, but it had also been crucial in the decision to select Doxiadis to deliver it. The image and ideas that Doxiadis promoted through his previous work and writings coincided perfectly with the Saudi Dream. As a science-driven, modernizing, global yet apolitical professional practice, DA seemed to provide a perfect fit.

As Chapter 2 looked internally to the situation in Saudi Arabia, Chapter 3 looked externally to contextualize the Riyadh plan in other relevant settings. It thus explored Doxiadis's personal background, training, and professional experience, as well as the standing and main ideas of the profession of urban planning at the time. Two arguments lie at the heart of the investigation in this chapter. First is that Doxiadis was an idealist whose work was governed by a number of powerful convictions, theories, and principles, which he remained loyal to in the Riyadh plan. These shed considerable light on the details of the plan, grounding many of its gestures and proposals within a larger body of writing and practice. The second argument is that the profession of planning in general was at the time enduring a serious crisis, as critics were beginning to point out how the hyper-functional, formalist proposals of early modernists had not only failed to alleviate the problems of cities internationally but also had in many cases made them worse.

Balancing many of the principles of modernism that he believed in with their apparent failure in practice was no small task for the Greek idealist. Careful not to repeat these mistakes, or be cast within the same shadow, Doxiadis's response was to propose a new model that the chapter explored as a form of "modernism 2.0." Through this approach Doxiadis could remain loyal to some of modernism's concepts, repackage some others, and add new ideas to strengthen his position. Principally, however, as a result of his experiences as a government official and a professional proponent of cities as instruments of human freedom, Doxiadis argued that the ideal role of a planner was not as a builder who was responsible for the exact design of physical elements of a city, but an imposer of order who created a system in which growth and development could occur according to more organic, time-dependent processes. In this way, as a practical dreamer, he imagined the outlines of a locally sensitive, universally applicable urbanism. Two of Doxiadis's main planning principles were of relevance here: his new science of ekistics and his vision of the universally applicable Dynapolis. As well-developed structures of thought, both were key influences on his Riyadh project. They were also a source for many of its contradictions.

After exploring the internal and external contexts for his work in Riyadh, Chapter 4 provided a descriptive and an analytical account of the 1972 master plan for the city. In so doing it leveraged the analysis of the previous two chapters and employed them as useful lenses to unpack and better understand its many proposals, motives, and ideas. Among its other contributions, the chapter sought to show that at this point in Doxiadis's career, the Riyadh plan was evidence of a fully developed theoretical and practice model. His concepts had matured and were palpable, his reputation was prevalent, and he had mastered his craft. The chapter showed how DA sought to

instrumentalize the many ideas of ekistics and the Dynapolis in its precise recommendations for the future of Riyadh. And it showed how these were deliberately modified to address the prior image of modernity Saudi officials had acquired through their previous associations with Aramco. However, it also demonstrated Doxiadis's view that the proper role of the modern planner was not to determine absolutely the placement of all of a city's future physical elements. Rather, his approach involved the crafting of a system and a framework to allow, encourage, and guide growth, which would occur according to natural forces with little intervention from their side. The main driver behind many of the plan's specifics was thus a desire to guide this growth in the best possible way — to organize it, make it rational, and maximize its benefits. In addition to balancing the needs for mobility through encouraging the use of private automobiles, this meant creating a nested series of communities at increasingly larger scales designed to preserve the neighborhood structure of traditional cities. It also meant engaging in an enormous effort to gather and analyze local data to provide a foundation for the proposal and its details. This effort had the further benefit of recruiting the methods of science to create a perception that the plan's specific proposals were neither subjective nor debatable. Instead, they were logical, objective, and inevitable.

The last chapter of this dissertation built on the previous chapters to pull together various threads and attempt to evaluate the legacy of the 1972 plan in a way that is objective and balanced. Typically, Doxiadis's work in Riyadh has been evaluated as a stand-alone project without providing a wider reading of its intentions or context. This reductionist reading has then allowed the 1972 plan to be scapegoated as the cause for many of the ills of the contemporary city. However, Chapter 5 explained how the discussion in the previous chapters affords the chance to unpack various additional layers of the plan and allow a new reading to emerge. Thus, on the one hand, the plan did contain a number of limitations — for instance, its inadequate assumptions about population growth — and these proved very problematic given DA's heavy reliance on data-driven analysis. Moreover, that approach depended on imported international building morphologies; it proposed a nearly complete reliance on private automobiles for mobility; and it ignored the cultural and environmental lessons evident in the construction of the city's old core. On the other hand, there have been positive legacies of the plan that are rarely discussed in scholarly literature, and the chapter argued that these largely derive from Doxiadis's understanding of the role of a planner as an organizer of urban systems rather than a builder of predetermined forms. In this sense, the chapter argued, the plan successfully created a mechanism for growth that has continued to guide and define the city's expansion until today. The city was growing rapidly, and at the time Doxiadis arrived, it urgently needed such a guide. In Doxiadis's own perception, the specifics and details of the plan were secondary to successfully creating an overarching logic and direction for future development.

In retrospect, this dissertation has tried to show that many lessons can be inferred from Doxiadis's project in Riyadh and his engagement with the city. For one, a master plan should not always be judged at face value by its apparent success at producing certain physical forms; rather, its success might have more to do with the processes and procedures it unleashes in a city. The physical forms proposed in the 1972 DA plan may thus have soon been rendered obsolete, but its enduring legacy has remained through its more intangible qualities: the dynamics it created, and the process it set in place. Thus, while a plan's physical structure is what may appear to matter most, in some instances what occurs beyond it matters more. Another clear lesson is that a planning exercise is seldom linear, and that understanding it as a product of a single force may miss the full reality of its impact. A plan does not occur in a vacuum; thus, a number of different forces directed at it from its context merge within it to create a final outcome. The planner is merely one of several

forces. Where a plan occurs, when it is produced, who works on it, and who it is created for all equally factor into its outcome. Another lesson for planners working on similar contexts in the future is that a plan is never neutral. While many might claim otherwise, even the most scientific plan contains elements of subjectivity.

Today, Riyadh is a truly global metropolis with a population of almost 8 million residents. It has an expanding urban territory of mostly concrete, single-family, detached villas connected by commercial corridors that vary in scale — all connected through an extensive transportation network connecting the city with the surrounding dessert. Riyadh is one of the most important cities in the region, if not the most important. It is home to multinational corporations, governmental and nongovernmental agencies, and the center of social, economic, industrial, political, and creative forces in the region. In the last five years alone, a number of megaprojects have been proposed and are now under construction. These include King Salman Park, the world's largest urban park, with an area of 16 km² and a world-class design; King Abdullah International Gardens, a world-class botanical garden displaying unique plants that is the world's largest temperature-controlled gardens; and Al Qiddiya, an entertainment megaproject that aims to create a global destination for tourism and leisure. Such megaprojects have global aspirations and many more are due to be completed within the next decade, as the city continues its ambitious trajectory of growth.

A visitor arriving by plane today will have trouble identifying the important elements of Doxiadis's plan in the existing city — other perhaps than its overall grid and the main commercial corridor cutting through its middle. The territorial boundaries of the city have expanded considerably; the location of key elements has changed; and its road network is now far more complex. However, if one drives along any of the city's main transportation thoroughfares, the Greek's imprint on the urban fabric is obvious, and his concepts about a city's growth become apparent. Many describe DA's plan as the most powerful instrument that currently drives the city's growth. The trend is ironic given Doxiadis's advocacy for planning in a lab from above. The plan's enduring relevancy is also intriguing given the amount of time that has passed and the other projects that have intervened since supposedly reimagining the city. The argument presented here, however, is that the plan's enduring quality is due to Doxiadis's genius as a master planner. The plan was above all a product of the Greek's perception of planning as a process and his view of the competent planner as one who created mechanisms of order to manage and enable urban growth. According to this perspective, the essence of a master plan does not lie in the placement of specific components, nor the production of a particular big picture; it is rather about creating a process a city can use to expand through time according to changing dynamics. Riyadh — indeed, any city — could be treated thus as a living creature. Ultimately, the extent of any city's future growth is unknowable and, in many ways, uncontrollable, but it can be directed and managed through strict order and logic toward an optimal possible future. Hence, while Riyadh's growth soon outstripped many of the physical components of the 1972 plan, the plan remained influential because of the logic and structuring mechanisms it introduced into the city.

Through the pages of this dissertation, my purpose has been to illustrate that Doxiadis's plan for Riyadh was a complex and multilayered project. Much like every other aspect of human life, in which there is no absolute right or wrong, urban planning projects can only be judged according to their relative value to future generations. None is an absolute success or failure. In instances of qualified success, appropriate decisions typically outweigh inappropriate ones. I believe this was the case with Doxiadis's proposal. Even though it may be presented today as a

basis for the city's shortcomings, these judgments are reductionist and do not account for the complexity of the project or its continuing relevance as a process. The project's outcome was also not linear; nor was it simple or one-dimensional. With this in mind, a reasonable judgment is arrived at only through accounting for the different pressures and dynamics that affected the plan and by understanding the motives behind its many layers. As the previous pages have argued, Doxiadis's personal background, professional ideals, urban planning practice, and familiarity with the condition of post-World War II cities shaped the plan in combination with Saudi Arabia's history of development, the impact of the petroleum industry, and the inculcation of a particular Saudi Dream through processes of Orientalism. Moreover, only by understanding all these factors can one can begin to arrive at a fair judgment of the plan. When these complex influences are understood, it is possible to properly account not only for its many limitations but also to contradict popular beliefs and credit it for its strengths. Ultimately, the 1972 plan may be seen as representing a timely response to a city that was in dire need of a modern vision for the future, one that created a system for instilling order through a period of unprecedented urban population and territorial expansion.

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