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**“TO COME OF AGE IN A DRY PLACE”:
INFRASTRUCTURES OF IRRIGATED AGRICULTURE IN THE
MEXICO-U.S. BORDERLANDS**

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ABSTRACT

In the Mexico-U.S. borderlands the social uses of water are changing as the focus of the economy shifts slowly from agriculture to industry and services. This article discusses the changes to the physical and social infrastructures erected during the first half of the twentieth century to support a regime of accumulation based in irrigated cotton. Infrastructure is proposed as a particularly useful concept for drawing connections between these social, economic and cultural changes, and emphasizing their materiality. The article draws upon the Social Structures of Accumulation and Regulation School literatures to explain the dynamics revealed through historical and ethnographic research in an irrigation district in northeastern Mexico. This analysis helps contextualize current conflicts over water use in the borderlands, and serves as a corrective for the overly symbolic approaches common to the “borderlands” literature.

“Can we resolve the past, lurking jaws, joints of time? The Base. To come of age
in a dry place.”—Jim Morrison

The Mexico-U.S. border region is defined by aridity. Like the societies that occupied this space before us, our borderlands society is based on the manipulation of water. During the twentieth century hydraulic infrastructure changed the landscape of the borderlands dramatically and irrevocably. The rivers and aquifers of the borderlands were dammed, channeled, straightened, pumped and stored, to the point where very little of the original riverine dynamics remains. These water sources were put to use irrigating vast extensions of land, and these irrigation systems were home to hundreds of thousands of colonists and immigrants. While mention of the Mexico-U.S. border usually evokes images of fences, *maquiladoras* and urban sprawl, the borderlands was built on irrigated agriculture. Today, that history still shapes all aspects of regional life: its production, economy, laws, institutions, infrastructure, people, social organization and culture.

This article treats the history and present crisis of irrigated agriculture in the borderlands of northern Mexico. In these pages I show that borderlands society was built in the first part of the twentieth century based on irrigation works and cotton production, and that irrigated agriculture is being displaced by industry, services and other activities as the motor of the region’s economy. This is a story of how an agricultural regime of accumulation, and the different physical and social

infrastructures that support it, was born, came of age, and grew old. I propose that this history can be better understood by recurring to the concept of “infrastructure,” and to the analytical frameworks developed by Marxist political economists in which this concept figures prominently. Two sources are particularly important: the literature on “Social Structures of Accumulation” produced by a group of radical economists in the United States, and the “Regulation” school created by a group of French thinkers. The insights of these scholars have expanded their influence in the social sciences because of the role they play in the historical geographical materialism of David Harvey. While I use these concepts to make sense of the large-scale social and historical phenomenon of irrigated agriculture in the borderlands, I maintain that an anthropological political economy that places ethnographic attention on local and regional histories can help us understand how this has taken shape on the ground. I also suggest that when considering irrigated agriculture we need to treat problems specific to land and water, and therefore need to push political economy in a more ecological direction. My final claim is that the perspective I develop in this article provides an alternative, more realistic way of understanding the concept of borderlands that has become so fashionable of late in anthropology.

PEOPLE, LAND AND WATER IN NORTHEASTERN MEXICO

Over the last ten years I have listened to farmers speak of their lives cultivating land in one of northern Mexico’s biggest irrigation zones: Matamoros, Tamaulipas, in the delta of the Rio Bravo/Grande. The zone consists of more than 500,000 acres of irrigated land watered by two contiguous irrigation systems: Irrigation District 025 and Irrigation District 026. The 025 Irrigation District, also known as the “*Valle Bajo Río Bravo*” (Lower Rio Bravo Valley), receives its water from the International Falcon Dam, by means of a derivation dam on the Río Bravo and the Anzaldúas Canal. The 026 Irrigation District, also known as the “*Valle Bajo Río San Juan*” (Lower San Juan River Valley), receives its water from the Marte R. Gómez Dam (previously the “Azucar” Dam) on the San Juan River, by means of the “Rhode” Canal. In the lives of these farmers we see glimpses of the history of irrigated agriculture in the borderlands—of how the borderlands were built.¹ The oldest of these men and women were born in the first two decades of the twentieth century, children of sharecroppers and migrant workers who fled the violence of the Mexican Revolution to harvest cotton, citrus and vegetables in the irrigation

¹ For a full treatment of how the borderlands were built, see Walsh (2008).

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districts of the U.S. Southwest. Doña Elisa, for example, grew up in Pryor, Texas.² Her parents emigrated from San Luis Potosi in 1912, and she was born in 1915. When the irrigation zone around Matamoros was built in the late 1930s, the whole family moved back to Mexico to farm 12.5 hectares (about 30 acres) of irrigated cotton land. The early years were difficult, but by the 1940s her family was settled and prospering. She married Don Felix in 1943. Don Felix came to Matamoros as a teen-ager during the depression, and soon found employment with the federal engineers building the flood control and irrigation system. When the works were finished, he received a 12-hectare parcel of irrigated land, where he and Doña Elena raised a family. Three children grew up on the farm, only missing school during the height of the cotton harvest when they were incorporated into the production process weighing cotton, selling food to migrant workers, and doing other odd jobs. Two of their children now live in the city of Matamoros and one son moved to Houston. One of Elisa and Felix's grandsons, Rogelio, just returned from Alabama to Matamoros to live with and take care of his aging grandparents. He commutes every day to the Valley of South Texas, where he builds houses on top of fields where his grandparents and their parents once labored clearing brush, building irrigation works, planting and picking.

In early 1998 I spoke with Don Felix and two of his lifelong friends about the past and future of irrigated agriculture in Matamoros.³ As we sat on his porch gazing out across the brown fields still not planted with sorghum, the three old men told me of the glory days of cotton in the 1950s when a farmer lived well. "A new truck every year," they said: "fellows would walk into the dealership in Matamoros with a big sack of money and pay for the truck in cash." Not like today, they told me, when a person farming the 30 or 50-acre plots created during the 1930s just cannot survive. Five hundred acres are needed now, just to get by. Yet by far the most serious problem besetting the farmers was that, for the first time, irrigation deliveries had been completely cancelled due to lack of water. No one was planting anything in 1998, because there was no water in the big international dams on the Lower Rio Bravo (or Rio Grande, when seen from the U.S.) and the government would not promise to move any down from the Upper Rio Bravo in Chihuahua. Since 1992 there had been steady reductions in the water given to the delta region for irrigation. Water shortages throughout the river basin caused serious conflicts

²Interview with author. Elisa, Valle Hermoso, Tamaulipas, 1997. I follow standard anthropological practice in changing the names of informants to pseudonyms.

³Interview with author. Fausto, Marcelo and Roberto, Poblado Anáhuac, Tamaulipas, 1998.

between regions, states and even national governments in the late 1990s and early 2000s.⁴ Analysts spoke of a water crisis in the borderlands, and hyped the conflict as a water war (Walsh 2004). Currently, another major conflict is unfolding in the delta of the Colorado River over a project in the U.S. that will effectively transfer water from the irrigation zone in Mexicali, to the urban users of Los Angeles and San Diego (Sánchez Munguía 2004).

The hydrological systems of the borderlands are in deficit (Carabias and Landa 2005; Moreno 2006). Since 1940, a tenfold, mostly urban, increase in population in the border states has put pressure on water rights established earlier, when the population was sparser and the resource was almost entirely dedicated to agriculture (Peach and Williams 2000). Besides this increase in urban uses, agriculture also expanded during this period. Put simply, in many hydrological systems in the border region we take more water out than goes in, and something has to give. The first to be affected are the ecological systems that depend on that water. Obviously, removing water from rivercourses threatens the plants and animals that live in them. What is not so obvious is that the use of aquifer water can have the same effect. Water flows down, attracted by gravity, and recognizes few absolute barriers (Pielou 1998). So when the subsoil water within a river drainage is pumped to below the level of the river, the water flows down and away from the river (Glennon 2002).

The drying of a river basin is a relatively long process, and the plants and animals that suffer its effects cannot make their complaints heard. As a result we are much more aware of the effects of water scarcity on humans: lower reservoir levels; ever-deeper and more costly wells; water rationing in cities and farms; and legal struggles. Domestic and urban uses of water take precedence over agriculture in Mexico and the United States, and so the effects of water scarcity fall on the farms. We are witnessing a crisis in the physical, social and cultural infrastructures of irrigated agriculture erected at the beginning of the last century, which enabled more than 50 years of steady economic and demographic growth in the region. In the borderlands, the dams, canals, laws, government institutions and policies, domestic economies, consumer habits and even expectations and aspirations are under enormous strain. When seen from this perspective, the “water crisis” so often mentioned in Mexico is more accurately described as the crisis of irrigated

⁴ Two issues of the *Natural Resources Journal* cover the problem of water scarcity in the Río Bravo / Grande watershed during that period: Volume 39, Number 1 (1999); Volume 40, Number 2 (2000).

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agriculture: that is, a crisis of the infrastructures upon which the borderlands were built.

INFRASTRUCTURE, CRISIS, AND ACCUMULATION

So what were the infrastructures of irrigated cotton agriculture in the borderlands? They can be lumped into three general categories: irrigation, cotton, and land and labor. In the first half of the twentieth century an economy and society was built in the borderlands that was based on massive systems of flood control and gravity irrigation, the production of cotton and other staple commodities (and also fruits and vegetables on the U.S. side), and the provision of labor by land reform and colonization schemes as well as by a vast pool of migrant workers that circulated throughout the region. Dams, canals, headgates, levees and other hydraulic works are clearly "infrastructures" in the most physical sense of the word, but the institutions that manage water can be understood as infrastructures of a social kind. The total aggregate of water laws and rights has a definite structure as well, as does the technical knowledge for operating the irrigation systems. Agricultural production is also defined by infrastructures: gins and cottonseed mills; railroads and ports; storage facilities; banks and credit systems; government extension agencies; commodity markets; etc. One such commodity that continues to define the borderlands is the labor power of migrants. The physical infrastructures that both enable and restrict the movement of workers also define the markets and prices for that labor, as do institutions such as the border patrol and other police forces. The quotidian experience of migrants structures their ideas, attitudes, dispositions, and hopes. Land tenure, although varied, was structured in definite ways to facilitate irrigated agricultural production. In Mexico, private landholdings were accompanied by a "social" sector consisting of *ejidos*, state-owned lands the use of which was legally assured to peasants and their descendants, and *colonias agrícolas*, which were farms to which individuals held title, but were organized communally to facilitate productive relations with the agencies of the federal government, such as the credit banks and the irrigation systems.

While irrigated cotton agriculture in the borderlands evidently depended on the structuring of activities and resources in three general areas (irrigation, cotton, land and labor), what is not so clear is the dynamic of that structuring. How are we to understand the relations between dams, canals, credit markets, *ejidal* social organization, cotton markets, aspirations of migrant workers, and the many other elements that comprise irrigated cotton agriculture in the borderlands? To approach an understanding of the structural dynamics of the crisis of irrigated

agriculture in the borderlands, we turn to a discussion among economists concerning the cyclical nature of capitalism, and the periodic expansions and contractions that mark economic history since the 19th century. During the 1920s and 1930s Nikolai Kondratiev (1984) published his theory of “long-waves” and Joseph Schumpeter (1939) published his analysis of the “business cycle,” each describing in his own way how the periodic expansion and contraction of capitalism was due to mechanisms internal to the economy. In the postwar period Paul Baran and Paul Sweezy (1968) as well as Ernest Mandel (1980) continued this line of analysis from a more clearly Marxist position, arguing that the natural tendency of capitalism to reach crisis is a result of the inevitable fall in the rate of profits, but that this “law of motion” of capitalism can be controverted by external, “noneconomic” factors such as technological innovation, wars, natural disasters, etc. What is important about this line of theorizing is, first, the assumption that various aspects of capitalist society form unified wholes during definite periods, second, that these wholes operate to enable accumulation, and third, that these unified wholes include a wide array of social and cultural (“noneconomic”) elements.

In the 1980s research emerged that sought to explain the world economic crisis and restructuring that began to gain importance in the 1970s. Often referred to in a general way as “globalization” this fundamental reorganization of the global political economy was seen as a move from one kind of capitalism to another. Two very similar schools of thought addressed this issue. On the one hand a group of French thinkers, known as the “Regulation” School, studied the formation of “regimes of accumulation” during specific historical periods (Aglietta 1979; Boyer and Saillard 2002). The unity and historical movement of these “regimes” was achieved through “modes of regulation” that operated in many dimensions: from the legal and political all the way to the emotional. On the other hand, a group of economists in the United States produced histories of the “social structures of accumulation” that formed around accumulation processes during defined periods of expansion and contraction (Gordon 1978, 1980; Kotz, McDonough, and Reich 1994). Both approaches built upon the strengths of previous work by investigating the economic, social and cultural dimensions of capitalist society as a unified whole. Furthermore, these formulations show the influence of the “cultural turn” in Marxist scholarship (Roseberry 1989; Williams 1977), downplaying economic determinisms and hyperstructural models in favor of culture and process.

The regulation and social structures of accumulation approaches have found a measure of new fame through the work of geographer-turned-anthropologist David Harvey (1989), whose book *The Condition of Postmodernity* enjoyed a great deal of

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popularity and influence. Part of the success of the book is precisely its ability to connect postmodern architecture, art and other cultural forms to fundamental tendencies in capitalism that have emerged over the last few decades. To achieve this Harvey resorts explicitly to the language of the regulation school theorists. Citing Alan Lipietz he states that

A particular system of accumulation can exist because 'its schema of reproduction is coherent.' The problem, however, is to bring the behaviors of all kinds of individuals—capitalists, workers, state employees, financiers, and all manner of other political-economic agents—into some kind of configuration that will keep the regime of accumulation functioning. There must exist, therefore, 'a materialization of the regime of accumulation taking the form of norms, habits, laws, regulating networks and so on that ensure the unity of the process, i.e., the appropriate consistency of individual behaviours with the schema of reproduction. This body of interiorized rules and social processes is called *the mode of regulation*' (Harvey 1989:122).

The centrality of "norms, habits, laws, regulating networks, and so on" to the concepts of "regime of accumulation" and "mode of regulation" clearly makes the regulation literature attractive to the cultural theorist. Simultaneously, however, Harvey undergirds this discussion of postmodern culture and the geography of flexibility with a thorough and painstaking analysis of the workings of capitalism, and it is here that concepts of "infrastructure" play a crucial part. In Harvey's ([1982] 1999) argument, elaborated more fully in a previous work, the central contradiction of capitalism is "overaccumulation," a problem that must be addressed through the destruction of capital or investment in enterprises that displace the realization of profit far into the future. Infrastructures soak up stagnant capital, alleviating crisis tendencies. Physical infrastructures are easily conceptualized. These are the dams, canals, roads, electric grids, and other elements of the built environment that require immense outlays of capital, often provided by the state. Social infrastructures are more difficult to grasp, as is their relation to the productive activities at the heart of capital. Education, health care, labor law, family structures, community social organization, and all the other elements of a vast "human resource complex" (Harvey 1999:399) form the substance of social infrastructure, a much more encompassing and social rather than cultural concept than that of "mode of regulation," and one that includes more of the intimate fabric of daily life. The surplus value created in the "economic" nucleus of the workplace

is exported to all the social activities here glossed as infrastructure. Eventually this investment returns value to the production process, whether, for example, by making the transport of commodities faster and cheaper, or by reducing health-related productivity of workers through better health care, or even by stimulating productivity among workers by instilling a corporate ethic. Obviously this process is infinitely more complex than the descriptions provided here or in Harvey's writings, and can only be understood as it unfolds in relation to the effervescence of class conflict, but the basic relationship between accumulation and the creation of infrastructures—including “norms, habits, laws” and all the less tangible elements of social infrastructures—is established through this analysis of the crisis tendencies of capitalism.

BUILDING THE BORDERLANDS: INFRASTRUCTURES OF IRRIGATED AGRICULTURE

At this point the Marxist approach reviewed here clearly offers the possibility of contemplating the unity of economic, social and cultural elements that coincide in a specific time and place. It should also be clear that empirically substantial histories and ethnographies must be brought to bear on concepts as encompassing as “infrastructure” if they are to gain explanatory weight. Irrigation works are infrastructures in the most physical sense of the term. From the prequest period until around 1880, small scale ditch irrigation systems were built and colonized by communities along rivers and streams throughout the borderlands, usually in cooler, wetter, mountain regions such as New Mexico and Chihuahua (Martínez Saldaña 2005; Meyer 1996). In the late nineteenth century, land and development companies in both countries built larger canal systems using concrete, steel and motorized pumps. Yet efforts to colonize these zones with small farmers were not very successful, and the large dams required to ensure water for these systems were too much for the private companies. The federal governments took over irrigation in the beginning of the twentieth century. The U.S. Bureau of Land Reclamation was created by the Reclamation Act in 1902, and that agency began to build dams such as the Elephant Butte dam on the Rio Grande near El Paso and Ciudad Juarez. By the 1920s and 1930s the Bureau of Reclamation commanded a huge budget and was building such massive dams as the Hoover (Pisani 2002). These dams stored water for new irrigation districts and provided electricity for the industries and cities of the Pacific Slope, which mushroomed in size after the Second World War (Fiege 1999; Nash 1984).

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Mexico did not begin a concerted program of dam-building until the late 1920s. Between 1910 and 1920 the Mexican revolution disrupted irrigation and colonization plans, and bankrupted the agency that financed infrastructure, the *Caja de Prestamos*. In 1926 a pair of laws passed by President Calles created the National Irrigation Commission (*Comision Nacional de Irrigacion*, or CNI) to build irrigation districts, and created a framework for establishing colonists on newly irrigated lands (Aboites Aguilar 1988, 1998). The irrigation systems built throughout the borderlands were, for the most part, big dam and canal systems that delivered water by gravity through unlined canals, periodically inundating the fields. These were monumental works of infrastructure: clear examples of what James Scott would describe as the aesthetic and planning style of "high modernism" (Scott 1998). Mimicking the flood patterns of the borderlands' river basins, these dams controlled and administered those floods.

The construction of irrigation infrastructure in the borderlands amounted to something of a race between the two countries to control and develop the water resources of the international rivers. As the dams were built and the uses of water increased, both countries recognized the need for a more comprehensive treaty governing the distribution of water in the Rio Bravo/Grande and Colorado basins. Yet the governments were engaged in a standoff. On the one hand, the Mexican irrigation district of Mexicali covered the last few miles of the Colorado River, and depended on the U.S. for its water. On the other hand, the most productive irrigation district along the U.S. side of the Rio Grande was the Valley of South Texas, which depended on the water that flowed from the Mexican tributaries of the Rio Conchos, Rio Salado, and Rio San Juan. Both countries recognized that the most effective pressure for establishing their rights to water was to put that water to productive use before it left national territory. Nevertheless, they also realized they could not establish uses for water that was not guaranteed by law to be available in the future (Hundley 1966; Samaniego 2006; Tamayo 1945).

Legislation, then, was a key social infrastructure supporting irrigated agriculture in the borderlands. After almost two decades of dam building and political maneuvering, in 1944 Mexico and the U.S. signed an international water treaty that governs the use and distribution of the water of the Colorado, Tijuana and Rio Bravo/Grande rivers. The 1944 Treaty ratified the division of water among the many users on both sides of the border, and provided a framework for the resolution of water conflicts so that they would not interfere with investment and production. The International Boundary and Water Commission, a binational institution, was created by the Treaty to oversee the application of the legislation

and the management of the shared water. The Treaty permitted the construction of dams in the course of the Rio Bravo/Grande, and in 1953 the enormous *Presa Falcón* began to deliver irrigation water to the Lower Rio Bravo/Grande of Texas and Tamaulipas. With the signing of the 1944 Treaty, the completion of the *Presa Falcón*, and the expansion of the *Valle Bajo Río Bravo* irrigation district around Matamoros, agriculture on the Mexican side of the Rio Bravo/Grande was deemed to have reached the maximum limit possible given the water resources available (Orive Alba 1945).

Flood irrigation, provided by the physical and legal infrastructures discussed above, was especially suited to a plant that was native to the arid and semiarid borderlands: cotton. Cotton was the crop of choice in the borderlands for several reasons. First, domestic cotton production in the United States determined the price and markets for the fiber around the world. Throughout the second half of the nineteenth century and the first half of the twentieth, the U.S. produced 80% to 90% of the world's cotton, and shipped most of that cotton to the industrial centers in Europe. The foreign currency earned by cotton paid for the importation of machinery and the creation of textile industries in places like Lowell, Massachusetts. As the U.S. industrialized, and the dollar got stronger in relation to other currencies, U.S. cotton became increasingly expensive. Because the U.S. produced most of the world's cotton, the price of cotton in the U.S. determined the price of cotton everywhere else (Clayton 1930, 1931, 1934; Wallace 1935).

Around 1900 high prices stimulated cotton production outside the old cotton belt in the southeastern U.S. Cotton migrated west to Texas and the newly opened irrigation districts of the southwest U.S., where mechanization and economies of scale lowered production costs (Foley 1997; Menefee 1941). Cotton also migrated south, to imperial locations such as Egypt, India, the Sudan and West Africa (Bernal 1997; Isaacman 1996; Isaacman and Roberts 1995; Roberts 1996). National governments in Latin America—especially Argentina, Peru, Brazil and Mexico—stimulated production as well (Guy 2000; Peloso 1999). Cotton was also seen as an important input for the creation of national textile industries in these developing countries. By the 1920s the Mexican government looked at cotton as the way to finance its ambitious new irrigation program in the borderlands, to create a new agrarian north, and to spur national development.

The great depression in the 1930s accentuated all these tendencies. Faced with a serious problem among its farmers in the south, the U.S. government created a set of institutions and policies to support cotton prices by purchasing surplus stocks of the fiber (Richards 1936). These institutions, as well as rapidly growing demand,

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kept cotton prices high from 1933 to 1958. Again, because the U.S. still dominated the production of the fiber, world prices were those set in the big cotton markets in New Orleans and New York. Farmers around the world earned about the same for their cotton as farmers did in the U.S. Cotton production for export boomed in northern Mexico during this time, and the newly opened irrigation district of Matamoros, Tamaulipas was the epicenter of this boom.

There were also strong ecological and biological reasons why cotton thrived in the borderlands. Cotton was exceptionally well suited to the borderlands irrigation systems, which were designed to deliver periodic floods of water to the cultivated fields, essentially reproducing the behavior of the borderlands rivers, which also followed a pattern of flood and recession. The cotton plant has a very deep tap root, which allows it access to subsoil humidity long after the floodwaters recede. Cotton also benefits from the extreme climatic conditions of the borderlands, thriving in hot sunny weather. Winter frosts help to reduce pest problems. Because the plant needs long nights for its biological process, cotton at the latitude of the borderlands is much more productive than cotton grown in the tropics. The borderlands irrigation zones had higher yields and better quality cotton than most places in the world (Porter 1995).

The third area in which important physical and social infrastructures of irrigated cotton agriculture were established was land and labor. The crisis of the 1930s opened the way for extensive agrarian reform in Mexico. With agriculture floundering and landless peasants and agricultural workers literally up in arms, the government of Lázaro Cárdenas orchestrated the nationalization of private lands and the creation of *ejidos*, or state-owned farms, and agricultural colonies (Eckstein 1966; Warman 2001). In the Mexican borderlands these measures created a sizeable class of farmers with access to anywhere between 10 and 50 acres of public land. With cotton prices as they were, this amount of land was considered sufficient to support a family. Some farmers were organized into collective farms. Others farming state land were given, or simply asserted, more individual control. Production was managed by the federal government through a sizeable apparatus of agrarian political institutions, banks, agronomists, railroads, irrigation engineers, and the like. The government obliged these farmers to grow cotton.⁵

Land reform only solidified the strong position held by the Anderson & Clayton Company, the world's largest cotton company, in Mexico's cotton economy.

⁵"Acuerdo" (1939). Archivo General de la Nación, México; Ramo Presidentes; Fondo Lázaro Cárdenas; Expediente 508.1/490.

Anderson & Clayton was already active in Latin America in the 1920s, but in the mid-1930s increased its presence remarkably, nowhere more than in Mexico. The crisis of the early 1930s bankrupted many local cotton companies, and Anderson & Clayton bought them out. In 1937 *La Clayton*, as people in northern Mexico call it, struck deals with the Mexican federal government to finance and market all the cotton produced by the state-owned agricultural sector. The government agrarian bank functioned as the intermediary.⁶ While land reform settled many migrant agricultural workers as small farmers, increased cotton production generated even more migrant labor, and an army of cotton pickers circulated throughout the borderlands during the summer harvest, what Carey McWilliams ([1942] 1968) once described as the “big swing,” Borderlands cotton agriculture, then, was based on a quite specific transnational structure of social classes. This class structure was, in turn, rooted in a built environment shaped by categories of land tenure.

A final area in which we can discern infrastructures supporting irrigated agriculture is in the realm of aspirations, desires, ideas, feelings and the subjective dimensions of culture. Raymond Williams’ (1977) concept of “structures of feeling” points out that even the most personal, private and individual experiences are integral to infrastructures. Throughout Mexico’s northern borderlands in the late nineteenth and twentieth centuries a developmentalist structure of feeling supported projects ranging from the construction of the Don Martin Irrigation System on the Río Salado, to the nationalist agrarian reform, to the constitution of regional associations of cotton industrialists, to the efforts of Don Felix and Doña Elisa to clear and farm their land in Matamoros. The slogan of the National Irrigation Commission, for example, was “*por la grandeza de Mexico*” (“for the greatness of Mexico”). Don Benito, another farmer from Matamoros, reflected the optimism of the generation of farmers that came of age with irrigated cotton when he told me: “I was 16 when I arrived to Matamoros. There was nothing here, and all I had was a screwdriver and pliers in my pocket. Today I am a wealthy man.”

⁶“Cárdenas to Clayton,” Archivo Histórico de CONDUMEX; Fondo Montes de Oca (hereafter CONDUMEX), 326/493, #30332; “Clayton to Montes de Oca,” CONDUMEX; document # 28195; “J.W. Stone to Gabino Vázquez,” CONDUMEX, document #28141; “Anderson Clayton to Cárdenas,” CONDUMEX, 306/493, document #28213; “Montes de Oca to Cannafax,” CONDUMEX, 306/493, document #28246; “Anderson Clayton to Montes de Oca,” CONDUMEX, 321/493; “Montes de Oca to Anderson Clayton,” CONDUMEX, 322/493, document #29867; “Sharp to Montes de Oca,” CONDUMEX, 323/493, document #29938; “Montes de Oca to Cárdenas,” AGN, Cárdenas, 705.2/26.

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This cultural infrastructure of developmentalism involves an idea of historical progress, of economic growth, of fulfillment, and it is usually couched in regional and national terms. This cultural infrastructure of development came to dominate precisely because it was inseparable from the material process of development that the region's inhabitants experienced. Doña Elisa and Don Felix, for example, could believe in and talk about progress because they went from being migrant workers to prosperous farmers. Developmentalism was part of a regime of accumulation based in irrigated cotton agriculture. Doña Elisa and Don Felix came of age with this regime.

The cultural infrastructure of development was also based in ideas about human biology and evolution. That is to say, developmentalism had a strong racial component. The people of northern Mexico were seen as different from those in the central and southern parts of the country: more advanced; harder working; more European; and more white (Aboites Aguilar 2000). While it is true that the nomadic indigenous groups that lived in the area were largely eradicated during the colonial period, it is also true that indigenous people from Tlaxcala, in central Mexico, were settled in their place (Martínez Saldaña 2005). In some of these settlements the indigenous language of Nahuatl was still spoken at the end of the nineteenth century. Many slaves and workers of African descent were also sent to the north to work in the mines. Still, what is important here is that despite this diversity, the north was considered whiter and more apt for development by the government planners and engineers that built the irrigation districts of the borderlands. For example, in the preliminary study for an irrigation project in the Lower Valley of the Rio Bravo/Grande, an engineer wrote:

The region's dwellers are similar in every way to those of the rest of the borderlands... of Nuevo Leon and Tamaulipas; they are of Spanish ancestry, white, bearded, with Caucasian features, tall and robust. Their customs are simple, their habits moderated, hard workers, frank and very honorable in their dealings. . . . In sum . . . it is clear that irrigation will bring them uncountable benefits that they will know how to take advantage of (Brambila 1930: 22–3).

This engineer was not alone. Other engineers and even the anthropologist Manuel Gamio, who participated in the project to develop irrigated cotton agriculture in the borderlands, continued this line of analysis (Gamio 1952). It was, and still is, quite common for people to discuss development in northern Mexico in

racial terms. This cultural infrastructure contributed to the decision made by engineers and government planners to build a society based on irrigated cotton agriculture in the borderlands, and the cultural infrastructure was in turn bolstered by the enormous success of cotton agriculture. Even today, although borderlands society is made up almost entirely of people who have migrated from central and southern Mexico, people in the region continue to consider their region more developed, harder working, less indigenous, and whiter. The developmentalist cultural infrastructure, with its racial substrate, both derived from and contributed to the regime of accumulation based in irrigated agriculture.

REFLECTIONS: INFRASTRUCTURES AND SOCIAL CHANGE

I began this article by stating that the infrastructures of irrigated agriculture in the borderlands have, with the people that built the borderlands, come of age and grown old. I then described some of those infrastructures in the areas of irrigation, cotton, and land and labor. I would like to suggest that using the idea of infrastructures to describe such different things as hydraulic works and feelings about progress and race can help us to confront some of central problems of political economy fruitfully: that of connecting the material and the ideal; the global and the local; the internal and the external. Those of us who do histories and ethnographies of the borderlands should not see the hopes, projects, works and experiences of Doña Elisa, Don Felix, Don Benito and their compatriots as lived *in the context of* irrigation systems and cotton production. We should try to see them as *the substance of* this regime of accumulation. Infrastructure, as a concept, helps us do this.

Still, what does it mean to say that these various infrastructures have come of age and grown old? The phrase “coming of age” is made more analytically powerful by connecting it to a processual, historical concept of cycles or waves: of “regimes of accumulation” to use the language of the regulation school. The physical and social infrastructures that ensure a smooth process of accumulation only work for a certain time before the same forces of production they help stimulate grow beyond the ability of those structures to resolve the crisis of overaccumulation. Attempts to measure these “long waves” or “long swings” scientifically have been made, and these concepts have been used to great effect to understand restructuring and the shift to “flexible” accumulation over the last 30 years (Harvey 1989). However, the sociological potential of the idea of structures of accumulation does not lie so much in establishing a universal periodization that describes an evolutionary series of different kinds of capitalism, or even in the detailed description of macrosocial and

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historical processes. The duration of these periods, and the configuration of society and economy that distinguishes each, depend on many factors that are quite local in scope, and are best appreciated by paying ethnographic attention to the complexity of local history. The idea that structures of accumulation are born, come of age, grow old and are replaced by others in a cyclical or wavelike fashion can shed light on long-term transitions in regimes of accumulation such as those analyzed by the regulation and social structures of accumulation schools, and by Harvey. However, this idea can also be used to study social change on a different scale: how, for example, the infrastructures supporting the production of one staple agricultural commodity in a certain region are replaced by or transformed into another set of infrastructures linked to another agricultural commodity. The transition in 1960 from cotton to basic grains in Matamoros implied a wholesale reorganization of the social fabric of that region—new kinds of work, new classes of workers, new businesses, new concentrations of capital, etc. However, this shift in crops did not coincide perfectly with the long-term historical movement from Fordist to flexible capitalism that occurred in the U.S. and Europe. Cotton did not disappear everywhere when “Fordism” fell apart; it just moved even farther south, to Michoacan, Chiapas, Guatemala and El Salvador. At the very least, a regional or local perspective shows that such transitions in regimes of accumulation are not clean breaks—they are neither total nor complete.

A political economy concerned with cycles and structures should begin by identifying what structural elements are changing. Or rather, how they change at different rates, and in different ways to one another. Take the example of the shift from cotton to basic grains in Matamoros. The cotton companies packed up and moved their gins and oilseed presses to Sonora and Michoacan where cotton was still grown profitably. New companies moved into Matamoros, bringing new industrial infrastructure to process the grains. The process of producing corn and sorghum was much more mechanized than that of cotton, so the mass of migrant workers that picked the crop in Matamoros no longer arrived every summer. The labor of the farming families settled during the cotton period was not needed for corn and sorghum, and these grains brought in less money than cotton. So the young people moved to cities in Mexico and the United States to work in industry, services, and commerce. These were major changes in the social structures of accumulation related to particular commodities.

Nevertheless, some things did not change with the demise of cotton agriculture. The irrigation infrastructure built in the period of cotton production remains for the most part unchanged and unimproved in northern Mexico. It works well enough

for irrigating basic grains, but cannot deliver water with enough precision or efficiency to support fruits or vegetables. After World War II, irrigation infrastructure in the southwestern U.S. incorporated technological advances such as lined canals, tubes, spray and drip systems, which in turn increased the precision with which water could be applied and thus permitted the production of fruits and vegetables. In northeastern Mexico the same basic flood irrigation systems built for cotton in the 1920s and 1930s remain largely in place today.

The pattern of land tenure created in the 1930s also remains largely intact. Constitutional reform in 1992 allowed *ejidatarios* farming state-owned lands to acquire property titles, effectively dismantling the enormous state agrarian apparatus. It was hoped this reform would create a market in land, but in the irrigation districts of northern Mexico land is not bought and sold usually. However, because these small parcels and the irrigation infrastructure that services them can no longer support a family, a complicated array of rental arrangements has been created to allow a few farmers to achieve economies of scale by renting everyone else's plots, and, even more important, their rights to irrigation water (Wilder and Whiteford 2006). Those who rent their lands to others have integrated non-agricultural sources of income into their domestic economies, marking something of a return from the family farm to the highly diversified peasant economy that characterized rural northern Mexico before the postrevolutionary era of irrigated agriculture (Miguel Juárez 2005; Robles Linares 2005).

The cultural infrastructure generated during the period of cotton agriculture persists as well. The developmentalist structure of feeling has not disappeared, but has taken a new form in response to new circumstances. At the turn of the millennium there were few left of the generation of farmers that colonized the cotton zones in the 1920s and 1930s. Those I interviewed spoke of the cotton era as a time of national progress under the guidance of an enlightened and benevolent federal government. Their children and grandchildren, who have come of age in a neoliberal period marked by economic crisis and structural adjustment policies, have much less faith in national progress, and much less trust in the federal government. The high modernist spirit in which the massive public irrigation works were built seems to them both a bit pretentious and a bit naïve. They criticize earlier generations for having received everything from the state. As one farmer told me, "the government made people lazy: they gave them the land, the seeds, the tractors, and the extension workers to drive the tractors. All that was left for them to do was

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to lie down in the fields and listen to the cotton grow.”⁷ In return for its largesse, the commonsense analysis continues, the one-party state secured political support. True development, many said, requires individualism and entrepreneurial skill, the willingness to take risks, and an international perspective. In the new developmentalism, visions of social progress are not as important as visions of individual progress.

This analysis of developmentalism in northern Mexico suggests that we reconsider commonplace academic understandings of “borderlands.” The literature on “borderlands” has many influences. First, there is a well-established tradition of writing histories of the Spanish Borderlands. These are, generally, histories of the far northern reaches of the Spanish empire and independent Mexico before the loss of the territory that now forms much of the southwestern U.S. Chicano history builds upon this older literature to explore how Mexican Americans have participated unequally in the more recent history of this region. Chicano Studies has also contributed a great deal to our understanding of the subjectivities of Chicanos in the Southwest, through the medium of creative writing, poetry and literary criticism. The concept of “borderlands” was reworked from this perspective by Gloria Anzaldúa (1987). Anzaldúa's insight that the borderlands was a lived and experienced subject position—an emotional, ideational, personal embodiment of social divisions of gender, class and race—was taken by anthropologists as the definitive contribution of studies of the Mexico-U.S. border (Gupta and Ferguson 1992; Rosaldo 1989). Rather than draw an opposition between these kinds of perspectives and the one elaborated in this article, I would like to suggest that much of the testimony of “borderlands” experience produced in academic and popular discourse can fruitfully be understood as social infrastructure. The challenge is to trace the connections between these discourses and the fundamental movements in the political economy and ecology of the borderlands, a project suggested by histories that chart the emergence of a Chicano middle class with presence in academia (Gómez-Quíñones 1990; Montejano 1987), as well as social research on emergent classes of Mexican Americans in the context of “postmodern” capitalism (Limón 1994; Palerm 1997).

Infrastructures are long-term investments that commit sizeable amounts of capital to the support of certain productive schemes, and in so doing they provide a temporary escape to the problem of overaccumulation generated within the production process. By their very nature they are inflexible and generate path

⁷ Carlos González, interview with author, Matamoros, Tamaulipas, 2006.

dependency. Physical infrastructures are massive works built into the environment that cannot be destroyed, changed or abandoned from one day to the next. Social infrastructures also have an enormous amount of inertia and are resistant to change, as many studies of modernization and development projects have pointed out (Scott 1998). Both kinds of infrastructure return value over a very long time, and cannot be abandoned before then without writing off the investments made in them. For these reasons the history of infrastructures is out of step with the cycles of accumulation and crisis, and the transitions between regimes of accumulation. As we can see with the borderlands crisis of irrigated agriculture, infrastructures often overstay their welcome.

The history of the borderlands during the twentieth century shows the consolidation of an irrigated agricultural development model based on relatively stable physical and social infrastructures concerning land, water, labor and commodities. Some structures have been transformed over time, but others, especially the hydraulic infrastructure, endure. This, however, is beginning to change, and the change is caused by the conflicts engendered by water scarcity. The shift of the region's economy over the last forty years to an industrial and urban focus, with enormous population growth, has placed a great deal of stress on the structures established during the first part of the twentieth century to capture, administer, deliver and use water. In both countries urban users have legal priority over agricultural users, and so agriculture is getting less water. The water conflicts raging throughout the borderlands are evidence of this crisis of irrigated agriculture. These conflicts are currently being addressed by projects to adapt and improve existing infrastructure to use agricultural water more intensively and efficiently. These efficiency schemes promise to reduce filtration of irrigation water into the soil, principally by lining earthen canals with concrete and applying the water by drip or spray directly to the roots of the plants. The water saved will then be available to urban users.

In the infrastructural efficiency schemes that I have studied—in the Rio Bravo/Grande in Chihuahua, and in the Rio Colorado in Mexicali and the Imperial Valley—there is no absolute reduction of water use. Neither has there been any attempt to lower the water guaranteed to each country by the 1944 water treaty. These infrastructures remain in place. Our rivers and aquifers are already overexploited, and the population is expected to double again in the next 25 years (Peach and Williams 2000). Worse still, in the future global warming is anticipated to reduce rainfall in the borderlands to levels approximating those of the drought years during the 1990s, 1950s and the dust bowl of the 1930s (Seager et al. 2007).

Established water uses in the borderlands will change. How this process unfolds can only be understood by considering the physical, social and cultural infrastructures built to support irrigated agriculture, and how these are transforming to accommodate a new regime of accumulation.

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