REPATRIATION PROTOCOL OF DECEASED MIGRANTS IN
SAN DIEGO COUNTY

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This study is dedicated to the living, to those who have lost someone, because even in death everyone holds significance to someone in life.
ABSTRACT OF THE THESIS

Repatriation Protocol of Deceased Migrants in San Diego County

by

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Master of Arts in Anthropology

San Diego State University, 2013

Every year thousands of people go missing worldwide. In the United States alone, over 87,000 cases were left unsolved last year, while internationally thousands more remain missing. The National Institute of Justice calls it "The Nation's Silent Mass Disaster" and the problem resonates across borders. Among the missing are a unique group of people that are left unaccounted for; those who illegally cross the international border between the United States and Mexico. Without proper legal documentation, individuals who enter the United States become politically invisible. In death, these individuals can remain invisible, known only as unidentified persons or Does. Repatriation is the end goal for all displaced decedents. Returning people home after death provides closure for the living. Providing this service is a necessary yet often complicated process for individuals involved in repatriation efforts of foreign nationals. This study originally set out to provide a clear picture of the repatriation process followed in San Diego County. However, upon the realization that a defined protocol does not exist in the county, the focus naturally redirected to the dissection of the procedures followed by the individual agencies who are, in part, responsible the eventual identification and repatriation of deceased migrants. As a result, instead of presenting a comprehensive understanding of the protocol for repatriating deceased migrants, this study has unveiled the roles of each agency. The tools available to aid in identification, gaps in communication between agencies and individuals who report the discovery of human remains, and demographic and regional predictions as to when and where unidentified human remains may be those of a deceased migrant are discussed. This study offers some insight into how the San Diego Medical Examiner's Office, and other jurisdictions, handle deceased migrants, and offers suggestions as how to improve available resources, and implement new resources that may simplify and expedite the reporting process.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>TITLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>THEORY</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Forces that Encourage Immigration (Socio-Economic and Political Theory)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Politics and the Human Condition (Socio-Political and Humanitarian Theory)</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Recovery and Forensic Analysis (Scientific and Medico-Legal Theory)</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>HISTORY: SAN DIEGO/MEXICO BORDER</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>GEOGRAPHY</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Geography of Sectors</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Imperial County</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>San Diego County</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>DEMOGRAPHICS</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Methods</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Current Migration Trends</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>National</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>State-California</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Local-San Diego</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Migration Related Deaths and What Follows</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>51</td>
</tr>
<tr>
<td>6</td>
<td>DISCOVERY AND RECOVERY</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Methods</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Civilian Discoveries</td>
<td>54</td>
</tr>
</tbody>
</table>
**LIST OF TABLES**

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1.</td>
<td>Legal Residence</td>
<td>34</td>
</tr>
<tr>
<td>Table 2.</td>
<td>Returns 2010</td>
<td>38</td>
</tr>
<tr>
<td>Table 3.</td>
<td>US &quot;Deportable Aliens&quot; 2002-2010</td>
<td>41</td>
</tr>
<tr>
<td>Table 4.</td>
<td>Apprehensions 2001-2010</td>
<td>43</td>
</tr>
<tr>
<td>Table 5.</td>
<td>Reported Deaths 1993-2011</td>
<td>47</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PAGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Figure 1. US Border Patrol sector map.</strong></td>
<td>26</td>
<td></td>
</tr>
<tr>
<td><strong>Figure 2. Estimates of the U.S. unauthorized immigrant population 2000-2010.</strong></td>
<td>39</td>
<td></td>
</tr>
<tr>
<td><strong>Figure 3. Immigrant employment rates vs. new arrivals.</strong></td>
<td>40</td>
<td></td>
</tr>
<tr>
<td><strong>Figure 4. San Diego reported deaths 1993-2011.</strong></td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>
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My loved ones for unconditional support, with a special thanks to my Grammy and my Parents

My Committee, Enrique Morones of Border Angels, San Diego Medical Examiner’s Office and all the people making an effort to resolve the issues of border-crossing fatalities, and the subsequent identifications and repatriations.
CHAPTER 1

INTRODUCTION

Every year thousands of people go missing. In the United States alone, over 85,000 people were open missing persons cases at the end of 2010, while internationally thousands more attain the same status (National Crime Information Center, 2010). Nancy Ritter of the National Institute for Justice calls this, "The Nation's Silent Mass Disaster" (Ritter, 2007), and the problem resonates across borders. Among the missing are a unique group of people that are left unaccounted for—those who illegally cross the international border between the United States and Mexico. Without proper legal documentation, individuals who enter the United States become politically invisible. In death these individuals can remain invisible, known only as unidentified persons or Does, while maintaining a status of unaccounted for or missing by their families back home.

The reasons people cross the US border vary, but employment is overwhelmingly the top reason for daily movement across borders (Fernández-Kelly & Massey, 2007). Many people from all over the world come to the United States in search of work and opportunity. The majority of migrants that cross the San Diego border are of Mexican nationality (United States Census Bureau, 2010). The hope of work is so enticing that people take extreme personal risks for the chance to achieve the "American Dream." There are two ways for foreign nationals to work in the United States: enter legally with a work visa or enter illegally forfeiting political and legal rights. Crossing without authorization promotes the use of dangerous methods and unknown risks to migrants, and, unfortunately, many will perish during the journey between nations. Many of these dangers are environmental factors. Undocumented migrants are forced to travel through the most extreme climates and terrain existing along the US border, including walking for miles under unanticipated circumstances and often under ill leadership.

Undocumented migrants who die within US borders are isolated from the normal process of locating and identifying missing persons. Because of the remote route taken, they are at a much higher risk of never being found. Law enforcement patrols the border regions,
but does not sweep the back country of San Diego in an effort to locate unknown stranded or deceased migrants. There are little to no resources afforded to agencies for unprovoked search and rescue efforts. Also, people of illegal status who reside in the United States may have missing family members themselves or information about migrants who were left behind whilst traveling across the border, but are often apprehensive about contacting local authorities for fear of retribution or deportation. Undocumented migrants, therefore, many go undetected and unreported. The unfortunate migrants who perish during their journey face another hurdle in death. They are in a unique political situation, between worlds, and neither a concern of their home country, nor are they the responsibility of the political institution under which they perished. It is a grey area with little allegiance from either government; they are neither here nor there, invisible to the political infrastructures that govern our worlds. Once deceased, the individual's remains are subject to the standards and protocol of the agency or agencies which are responsible for processing the decedent. A standard protocol with a paper trail and chain of custody which all parties abide by has not yet been established in San Diego. Therefore, it is left to the discretion of those who locate the remains as to when and to whom to report the remains. Each individual or institution follows their own protocol for reporting the remains. The lack of a standardized process ensures confusion and difficulty when it comes to locating a missing person. The desired result is always that of repatriation of the remains to the appropriate locale and persons. However, in order to achieve these goals the decedent(s) must be located, identified, next of kin must be located and notified, and then repatriation can occur. Without the cooperation and involvement of all appropriate agencies and the international public, the task of repatriation can be nearly impossible. The efforts made by the individuals and agencies in the process of locating, identifying, and eventually repatriating deceased illegals is currently a humanitarian effort more than a followed protocol. All counties, states, and countries respond differently to the problem of unidentified human remains that are presumed to be undocumented migrants.

In San Diego’s neighboring county, Imperial County, there is a cemetery filled with hundreds of white crosses. These white crosses mark the graves of fallen unidentified migrants. These people once had hopes, dreams, homes, and families and still attract the attention of concerned living populations. Surrounded by hundreds of equally unfortunate
migrants, each cross marks the resting place of an individual who no longer exists physically, politically, or legally, but still exists in someone's memory, in someone's life. While the nameless bodies lie in California, loved ones wonder about the welfare of the missing and continue to bear the burden of not knowing their fate. Emotions run wild with uncertainty. Loss of a loved one is difficult on its own and without closure it is nearly impossible to move on. Questions are left unanswered, and false hope is often clung to until the fate of a person is known. The most crucial question that can be answered, the answer that can bring closure and allow a person to continue with their own life, is that of life and death. In the case of a missing person this question is one that everyone, including the victim and the surviving family, deserve to have answered. Providing the answers by locating and identifying a decedent, not only brings closure to the living, but allows the deceased to be laid to rest, by way of repatriation, in their respective country and in a manner that reflects their culture.

It's a universal human right to be laid to rest by friends and family, "Everyone has the right to leave any country, including his own, and to return to his country" (United Nations, n.d.). In life, people live by their own unique cultural norms, and in death they should be cared for by those who know and value their beliefs. Ideally, to achieve all that is deserved by a person in death, San Diego officials prefer to repatriate all individuals who do not have legal, political, or familial ties to San Diego. Repatriation is the act of returning someone or something back to their country of origin (Repatriate, n.d.). It is an important process that provides closure to surviving friends and family while respecting a fellow human being's right to a decent burial.

Repatriation protocol and practice in San Diego county is the main focus of this study, specifically as to how it applies to undocumented migrants. In this study I will explore the current methodology and protocol for the repatriation of illegal deceased migrants, give a brief history of the areas impacted, discuss issues that govern illegal migration patterns, identify areas of concern, and offer suggestions that may be used in San Diego County as part of a Standard Operating Procedure (SOP). The entirety of the research and findings will be discussed through an anthropological lens, focusing on the humanity of the situation and emphasizing the importance of returning decedents to their homes.

There are many steps to be followed in repatriating deceased migrants and just as many agencies involved in the process. The most crucial step is identification of the remains.
Identification is necessary for the legal generation of a death certificate and for the body to be released to the family, or in the case of undocumented migrants, the appropriate consulate. Without identification decedents remain in limbo, within the legal jurisdiction of the United States indefinitely. In addition to the medico-legal methodology used by agencies, there are a number of digital databases that help identify Jane and John Does. The main obstacle with these databases is the lack of awareness of their existence and limited fluidity of sharing information across databases. These recourses are available worldwide and will be discussed further in this study.

Consolidation of information, leading to a standardization of protocol and procedure would assist in the identification process and expedite repatriations. By incorporating information from the law enforcement agencies in San Diego with the resources provided by the Mexican government, it is the intent of this paper to present a clear and concise understanding of the processes implemented, and resources available in San Diego to all parties involved, including both the professionals and the families of the missing and unidentified.
CHAPTER 2

THEORY

There are many pressures experienced by those who decide to attempt to cross into the United States without proper documentation. Every stage of the journey has its own set of challenges and pressures. People risk everything to pursue a life in the United States. From the time they decide to embark on this journey to when they might become unfortunate casualties, their journey is influenced by a variety of factors. Political, economic, social factors all play influential roles in the path of an undocumented decedent (Anderson, 2008; Ellingwood, 2004; Fernández-Kelly & Massey, 2007; Hinkes, 2008; Krissman, 2005).

Reasons that drive migration, illegal and legal, are multifaceted and complex with a common goal of creating a better life for themselves and/or their family. As much as people would like to accomplish this task legally and easily, the United States immigration laws make it difficult and costly to obtain legal status as a migrant worker and/or resident (Ellingwood, 2004). Therefore, migrants entering illegally are often desperate. Leaving home, they embark upon a dangerous journey to a land of uncertainty. In order to increase their odds of arriving safely, some people pay large sums of money to have a guide, a coyote, lead them safely and easily across the border to their destination. Coyote is a term that refers to someone who promises to safely guide peoples across the border and to their destination for a fee (Ellingwood, 2004). Unfortunately, the promise of a painless, speedy journey is rarely kept. Often people who use coyotes are misinformed, poorly guided, unprepared, and ill-equipped to successfully complete the crossing. People who cross in this manner are often told that the journey is fast and effortless. Many are quick to believe the lies they are told, blinded by the dream of living in America. Very often their lives are in the hands of a depraved group of criminals who prey on the desperate state of migrants and see each person as merely a paycheck. Payment is usually collected prior to the crossing, so the welfare of their party members becomes minimally important once the border is breached. Many survive the journey and arrive safely to their destination; others are not so fortunate, and are either apprehended by US officials and deported, while the even less fortunate perish along
the way. Those who do not survive the journey are left behind. Decedents are abandoned on foreign soil, and therefore their ultimate fate is left in the hands of US agencies. Each agency has its own set of guidelines for handling undocumented decedents, so there are many factors that govern the decisions involving how to handle undocumented remains. In this section, the theory that governs the decisions of the individuals in life, and those decisions made by legal and medico-legal agencies after death will be discussed.

**FORCES THAT ENCOURAGE IMMIGRATION (SOCIO-ECONOMIC AND POLITICAL THEORY)**

Globally, and through time, economic and political factors have continued to be important factors that influence migration, and they are commonly interrelated. People desire socio-economic and political systems that protect their interests, offer opportunity to thrive and provide security for themselves and their families. The absence of these provisions drives people to search for it elsewhere, encouraging migration. The problems driving migration north from Mexico and other Latin American countries are no different. People flock to opportunity and prosperity. The US, historically and currently, is a country known to be a place where impoverished people of the world find hope. Failure of the economic and political systems to which citizens are bound by unwritten social contracts force citizens to look elsewhere for economic opportunities and security in order to ensure their survival and protect the welfare of their families. North America has experienced significant economic ups and downs in the second half of the twentieth century, which has influenced relationships between countries, specifically the US and Mexico. These relationships, forged in the previous decades, continue to haunt the US-Mexico policies and negotiations. In the late 1980s through the mid 1990s, the United States looked to countries with failing economic systems, such as Mexico and many other Latin American countries, as an investment (Fernández-Kelly & Massey, 2007). Although the US has also had its share of economic recessions, US foreign investment created a relationship of expected economic reciprocity. Espenshade (1995) has discussed multiple theories involving migration and, specifically, what encourages illegal migration. He underlines two sides of the economic equation that creates a market attractive to despondent people, and encourages them to travel far from home for monetary gain. On one side there is the classic model of supply and
demand, as described by Adam Smith’s (2003) fundamental idea of the Free Market and Neoclassical economics. In this economic model suppliers are always looking to maximize profit margins while meeting the demands of the consumers (Espenshade, 1995; Smith, 2003). On the other side, there are the people who drive the market by providing the supplier with cheap labor. These laborers are individuals from lower socio-economic positions with few options, and are more likely to work in subpar conditions for less than standard pay. Together these forces create an economic environment that encourages people from poor regions to gravitate to the low wage jobs in wealthier places with economic opportunities (Espenshade, 1995).

The economic paradigm in the US allows for change in socio-economic status and encourages people to work for it. Under Neoclassical economics, supply and demand dictate social actions. The individual is the prime actor in this model, looking to improve his or her own life by opting to go where the work is. Therefore, migration patterns will generally reflect this socio-economic relationship. This model is relative to the migration patterns observed in the United States because the US thrives on capitalism: a supply and demand Neoclassical economy that was built by the hands of low wage immigrant populations. Hope and despair culminate to create a powerful force that will continue to encourage the migration of marginalized populations, by legal and illegal means. The realization of the desperate relationship between illegal migration and the economic and political situation of recent years is captured by Ellingwood (2004) in his communication with Mayor Borane of Douglas, Arizona. Borane stated in a plea to then President Clinton that "it was time to admit the obvious: Mexican workers would come as long as U.S. jobs beckoned and their own nation's economy remained backward" (Ellingwood, 2004, p. 106). This classic understanding of how people move between social-economic systems is embellished with the “New Economic theory” where supply and demand remain the underlying drive for migration (Espenshade, 1995). This is often fairly common with migrants who pass through the US/Mexico border looking for work. Another factor that drives people away from home is the lack of allegiance and security provided by socio-political institutions. This delicate relationship was first described by Rousseau in 1762 and has continued to be recognized as a crucial concept in social theory (Arendt, 1958; Rousseau, 1762). Rousseau described the Social Contract as a key figure in the fundamental foundation of a governmental society.
The socio-political contract between a government and its subjects is an unwritten law, understood as a symbiotic relationship of reciprocity between the two parties. As Rousseau explained in his infamous “Social Contract,” the political institution is responsible for providing its citizens with social order, a sense of security, and preservation of their civil rights. In return, the patrons relinquish their sovereignty and agree to follow the laws established to ensure every man a fair existence (Rousseau, 1762). When the contract is broken by either party, it becomes void. Citizens are no longer obligated to be allegiant to a government that does not protect them. Consequently, citizens with no loyalty to their political institution may flee with little regard to rules and regulations established by the government, while political institutions punish anyone who defies the laws and denies social obligations. It is a delicate balance between sovereignty and subjugation, between hope and desperation. Economic changes imposed by government leaders which benefit one demographic, while negatively affecting another, is an example of how this social contract be broken, driving people to look elsewhere for security (Rousseau, 1762).

In many countries south of the border, the implementation of the North American Free Trade Agreement (NAFTA) coupled with an economic downturn, created a situation, where some of the most marginalized populations suffered the greatest loss of economic stability (Fernández-Kelly & Massey, 2007). Socio-economic pressures felt by those left to fall between the cracks in an economic shift such as the acquisition of NAFTA, coupled with the devaluation of the Peso, are heavy. NAFTA was adopted in 1994 as an international agreement between Mexico, Canada and the United States to allow economic trade and development across borders without the taxes and restrictions historically enforced (North American Free Trade Agreement Implementation Act, n.d.). NAFTA was created as an economic bill, promising economic improvements across borders. However, the agreement failed to consider population movement and how the change in economic development would alter means of income for many who already lived in the margins of society, and depended on the consistency of a limited market.

According to Fernández-Kelly and Massey (2007), “[T]he purpose of NAFTA was not merely to facilitate trade and open markets, but to expand opportunities for investment. The treaty paid little attention to workers mobility . . . its U.S. backers instead insisted on the unilateral right to prevent Mexican workers from migrating through restrictive border
policies” (Fernández-Kelly & Massey, 2007). In addition to dismissing population mobility concerns, NAFTA removed many of the financial subsidies rural farmers were receiving (Fernández-Kelly & Massey, 2007). Those affected most were and continue to be the citizens living on the cusp of poverty. People living in rural villages can no longer sustain their way of life, and are left to their own devices. Omitted from political negotiations, abandoned by their government, and left in a state of desperation, many resort to migration, which is a logical solution to a frustrating and often hopeless situation.

**POLITICS AND THE HUMAN CONDITION (SOCIO-POLITICAL AND HUMANITARIAN THEORY)**

Upon deciding to illegally cross the border, individuals have made the choice to forfeit their political rights preserved under social obligation and political law. Illegally fleeing a political institution where one holds legal citizenship compromises their rights as a citizen. Once the border is illegally crossed and one is in another country, their government is relieved of obligations they have towards that citizen. Moreover, the country which individuals enter as undocumented migrants does not have a natural obligation to protect their rights as legal citizens either. The only legal acknowledgement and government assistance afforded to undocumented migrants is that of humanitarian laws and those laws implemented in the political institution in which one now resides. This quagmire of a situation leaves undocumented migrants in a very vulnerable position; they are at the mercy of strangers in a strange land. Moreover, this creates a subject of confusion and contention for the countries from which illegal migrants originated and the country which they fled to.

Political institutions are a business and do not want to be responsible for people who are not legal active members of their society; additionally, citizens fear unknown effects brought with undocumented migration. Undocumented people are left in a grey area between political institutions, in a void where they have no political rights, protection, or validation of existence. People find themselves having to negotiate between two spaces, while existing somewhere in between. They have given up their rights and security allotted by their natural citizenship and entered an institution where they have no political sanction, rights, or identity. Existence becomes two fold; they now exist within two separate political institutions. Life in their country of origin is reduced to a paper trail, or a mere memory.
They are physically occupying a space within foreign political boundaries and yet not recognized as part of the population. Individuals living in a foreign country without proper legal documentation live in a void where their legal and political existence and accompanying civil rights are reduced to nothing. In time, migrants may achieve some recognition through participation or legal processes, but upon entry without documentation little to no political or social privileges are afforded. People crossing two political borders without proper legal documentation become invisible the instant they step across political boundaries. In life, they find themselves in a gray area between worlds, not belonging to one or the other (Arendt, 1958; Birmingham, 2006). In death, illegal migrants remain in this political gray area with an invisible status; neither their home country nor the country they died in has a political obligation to them. Humanitarian actions and humanitarian law are the only universal guidelines dictating how undocumented migrants are treated. Often, undocumented decedents are left where they lie, as not to jeopardize the welfare of the surviving party members. Therefore, little information as to the identity of the deceased is provided to those who recover the individual(s). It is the responsibility of whomever comes into contact with undocumented people, alive or dead, to ensure the humane treatment of all. “All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood” (United Nations, n.d.).

**RECOVERY AND FORENSIC ANALYSIS (SCIENTIFIC AND MEDICO-LEGAL THEORY)**

Upon discovery of human remains in San Diego County, it is the responsibility of the San Diego Medical Examiner's Office (SDMEO) to see to the proper, legal, and unbiased treatment of the decedent; regardless of the state of preservation, ethnicity, legal status, nationality, etc. In the case of deceased migrants, their locations are often remote and not easily accessed. Therefore, often, SDMEO are not the first agency to arrive, and the manner in which the decedent is handled is particular to the first respondent. Each responding agency abides by standard operating procedures tailored to their legal obligations, with no collective standard methodology, or means of documentation. This makes it very difficult to have a fluid process through which the decedents are processed. The major agencies
involved in San Diego are the Border Patrol, SDMEO, and the Mexican Government. There are smaller agencies and individuals who take part in assisting with the recovery, processing, and the repatriation of deceased migrants, but the above are the primary agencies involved. Due to the elusive nature of migrant trails, many fall victim to exposure, and suffer extreme decomposition and skeletonization before they are located and brought to a facility for examination. Forensic Anthropology then becomes the primary method of analysis (Anderson, 2008; Baker & Baker, 2008; Hinkes, 2008; Spradley, Jantz, Robinson, & Peccerelli, 2008).

Identification is the most important piece of evidence when trying to determine the proper method of handling human remains, post examination. Within the identification process the likelihood of citizenship of the decedent needs to be determined. If identification is not located on the decedent, forensic anthropology is used to assess the biological ancestry, sex, stature, and age in order to help make identification. This is accomplished through many methods of examination. For example, biological ancestry can be determined by biometrics, cranial metrics, non metric traits, and isotopic analysis of the bones and teeth. Other methods such as forensic odontology, collection of antemortem medical records, physical description, and DNA analysis are utilized to identify human remains. DNA databases have been created to collect and cross reference the data and evidence collected and processed by the Forensic Anthropologist and Medical Examiner's Office or Coroner (ME/C). More on identification methods utilized in San Diego County will be discussed in a later chapter; however, a basic explanation of forensic anthropological theory in reference to medico-legal analysis will be discussed below.

Forensic Anthropology studies show that morphological traits may occur at a higher frequency in one population than another. Historically, biological ancestry of skeletal remains was determined by the examination of multiple individuals from three generically labeled world populations: Caucasoid, Negroid, and Mongoloid. Each traditionally has a higher frequency of specific phenotypic and genetic traits. Caucasoid is used to describe individuals of a general European ancestry, Negroid refers to individuals whose biological ancestry is primarily of African origins, and Mongoloid is described as those whose biological bone structure is most closely related to people of Asian or Native American decent. In addition to biological ancestry, bio-metric analyses can be performed to reveal the
stature and sex of an individual in relation to the initial presumption of ancestry. In a state of decomposition, where skeletal analysis is the most reliable method of identification, Forensic Anthropologists prefer specific bones, in order to determine age, sex, stature, or ancestry. Through time, Forensic Anthropology has developed, tested, and accepted standard methods of analysis that target specific bones and unique morphology that appears on that bone to determine identifying biological factors that may contribute a likely physical profile of the decedent. For example, certain areas of the pelvic bone are used for aging and sexing an individual. Also, measurements and analysis of the cranium (craniometrics) can lead Forensic Anthropologists to the age, sex, and ancestry of an individual. However, these standards of analysis were accumulated generations ago and now need to be re-examined to be applicable to modern populations that do not fall into these historic categories. Many contemporary scientists are doing just that, working to improve these methods for people specifically from Mexico and other Latin American countries (Anderson & Parks, 2008; Baker & Baker, 2008; Birkby, Fenton, & Anderson, 2008; Hinkes, 2008; Spradley & Jantz, 2011; Spradley et al., 2008). For example, Dr. Katherine Spradley is currently working on creating a database of cranial measurements from people of known geographic locations, which will help identify unidentified migrants of Latin American origin through craniometrics. This method takes a set of measurements of specific points on the skull and compares those measurements to data sets of known populations for possible group origins and statistical relationships (Spradley et al., 2008; Spradley, personal communication, 2012). This new data is crucial to identifying migrants because up until recent times comparable statistical data for craniometric analysis were only available for individuals of primarily European, African, or Asian descent, which skewed results for individuals of other ancestral populations. Dr. Spradley is one of many in the Forensic Science community who in the last decade has recognized the insufficiencies in specific methodologies, which retard the ability to accurately identify deceased migrants and has actively addressed the problem. In 2004, the American Academy of Forensic Sciences (AAFA) held a symposium titled "Death Investigation of Undocumented Border Crossers" and subsequently published the presented papers in the 2008 January edition of the Journal of Forensic Sciences (Anderson, 2008). The forensic community has since had the attention of government officials and focused on improving scientific methodology to better accommodate identification of deceased migrants.
The SDMEO uses all the information provided to make a positive identification or provide a description of the individual, with hopes of aiding in the identification. If identification is not attainable through visual methods, the SDMEO looks to the Forensic Anthropologist to use scientific principles, specific to skeletal analysis, to examine the remains and suggest a statistically probable profile of the individual. Accumulation of metric information from individuals known to be of a specific geographic origin, allows scientists to more accurately determine the biological ancestry and region of origin of individuals suspected to be from countries south of the US/Mexico border (Anderson, 2008; Spradley & Jants, 2011).

In addition to identification, forensic examiners determine cause of death. If there are no signs of homicide, the case is handled solely through the SDMEO. However, if evidence of foul play is present, local law enforcement agencies are involved. In cases of migrant fatalities, exposure to the elements is the number one cause of death (Anderson & Parks, 2008; Ellingwood, 2004; Hinkes, 2008). Environmental and dehydration related fatalities often lack trauma, and rarely leave skeletal evidence as to cause of death. Therefore, some exposure cases may be ruled "unknown," while other cases may possess sufficient evidence to determine "death by exposure." Circumstantial evidence that may aid in determining cause of death, include the location, condition, and context of the remains, as well as any associated materials found with the remains. These same factors also help identify a national status: as a US national or foreign national. Together, the contextual evidence and the scientific analysis of the remains conclude with an identification or a profile of a Jane or John Doe.

Additionally, the evidence collected must follow proper legal standards, and until determined otherwise all parties must treat the victim as a forensic concern. During the collection process, thorough and sufficient documentation is necessary, a clear chain of custody must be established, and all evidence must be handled according to the highest standards to ensure all evidence is presented and processed in the most comprehensive manner possible. Due to the medico-legal obligations of Forensic Anthropologists, in addition to the human remains presented and examined in the lab, they may require further information for a comprehensive understanding of the case. Documentation and evidence collected during the recovery of the body can prove to be the information needed to conclude an investigation and confidently provide identification.
Until identification of the decedent is determined, the SDMEO cannot release the body to any requesting parties; therefore, all precautions as to the identification must be taken. In cases where the body cannot be identified through autopsy or analysis, the SDMEO treats the remains as unidentified human remains (UHR), or as they are more commonly referred to: Jane or John Doe. Documenting Does requires a thorough description of the individual, circumstances, personal effects, evidence found on or around the body, and the information acquired through physical examination of the remains. This information is retrieved and entered into the appropriate database/s, in accordance with applicable laws, in hopes of a positive identification.

Identification is crucial for the legal acknowledgment of death and closure for the family. Without a positive identification a death certificate cannot be issued and therefore all legal proceedings following death, such as inheritance and claim to a body, cannot happen. Identification is the first step in closing the legal and personal file on an individual, concluding a physical and political existence. Once identification is achieved the process for repatriation can begin.
CHAPTER 3

HISTORY: SAN DIEGO/MEXICO BORDER

Spanish sailors first set foot in California, then known as “Alta California,” in 1540. Shortly after in 1542 Cabrillo began a reconnaissance of the Alta California coast. Cabrillo’s mission brought recognition to the geography of the California coast, but it was not until much later in 1769 when Father Juniper Serra established Mission San Diego de Alcala, that San Diego was recognized as a Mission territory (Starr, 2007). At this time there had been minimal contact between the San Diego Natives and Europeans and little reason to fight over land. Since the establishment of the Mission system by the alien Spanish, there has been a struggle between nations for the right to occupy California. It has been called home by a number of different people throughout history. The 1769 mission conquest led by the Spanish ended in 1821 when Mexico won its independence from Spain. California was part of Mexico for 27 years, which ended with the defeat of Mexico in the Mexican-American War in 1848. California then became independent of Mexico and was admitted into the Union in the year 1850. California has been and continues to be an area of controversy, and up until the mid 1900’s people regularly moved freely through Baja and Alta California, crossing the present day border region between Tijuana and San Diego with ease and purpose (Ellingwood, 2004).

At the end of the Mexican-American war, the Treaty of Guadalupe Hidalgo was signed on February 2, 1848. After the treaty was signed, there was a need for a defined border separating the United States and Mexico. The border between the two countries took just over two years to delineate. Ultimately the border was defined, running along natural divides such as rivers and corridors in addition to constructed monuments, such as the stone markers, treaty memorials, and fencing, which mark the boundaries between the neighboring countries (Hughes, 2007). The US/Mexico border spans nearly 2,000 miles, starting at California's Pacific coast traveling east through Arizona, New Mexico, and ending at the Gulf Coast of Texas. California hosts approximately 150 miles of the border shared by two counties: Imperial County and San Diego County. Imperial County consists of 4,176.6
square miles of the southeastern-most portion of California bordering Yuma, Arizona, with 64 miles of US/Mexico borderland. Nearly equal in size and length, San Diego County consists of 4,206.63 square miles, 86 miles from east to west, and extends from the Pacific coast to the western border of Imperial County in the Imperial Valley (United States Census Bureau, 2010). This political border established in 1850 divided a geographic region into two independent states with people of common cultures occupying both sides of the border.

Historically, the border between the two countries has been of little concern to the ruling government or to the citizens of either side. The border was commonly crossed for reasons ranging from work, to family ties, to the pursuit of food and other resources necessary for the sustainment of life (Ellingwood, 2004). However, in Alta California there was a period of intense hostility between the Spanish and Native Americans during the initial missionization and occupation, which led to the reduction of the Native American population by an estimated half (Starr, 2007). While populations occupying the border regions may have had opposition and hostility towards each other, the governments presiding over the territory did not label it as an area of grave concern until the 21st century. In 1821 Mexico won its independence from Spain, and Baja and Alta California were united. During this time there was a push for secularization of the mission land, creating the era of the Dons or the Rancho era (Starr, 2007). During this period, people lived without a boundary in the border regions. Not until 1848 did the idea of a border separating Baja and Alta California come into existence. Hence, people continued to move throughout the region as if it were still one continuous territory. It was common for horse and cattle ranchers to move back and forth between countries on cattle routes, and just as common for people to cross the newly established border (Ellingwood, 2004; Fernández-Kelly & Massey, 2007). Often families had members on both sides of the border and would frequently gather together with no regard for the invisible partition of land. Before a political boundary was constructed by the United States, local inhabitants, Mexicans and Native Americans had family all around the Southern California region and moved readily through the landscape, as described by Starr (2007), "Their was a world of river, creek, or desert oasis, and settlements that could easily be moved," not of political boundaries and dividing borders (p. 15). Tradition is not broken easily and people have moved through this space relatively freely, safely, and confidently for years. The reciprocity of a labor force from Mexico, and the economic benefits capitalized
upon by the US market has been a mutually beneficial system that continues to dictate the immigration patterns seen today. The restrictions, tight control of the US/Mexico border, and criminal prosecution of migrant workers are relatively new concerns.

Through the 1960s the US/Mexico border was minimally maintained and immigration laws hardly enforced. From 1942 through 1964 there was a guest worker program in place known as the Bracero Program. It allowed many Mexican and other Latin American citizens to move across country borders for work. This program encouraged people to cross borders to work in the US agriculture industry, which helped fuel California’s leading element of economic stability (Ellingwood, 2004; Fernández-Kelly & Massey, 2007; Galarza, 1964). In the 1960s drug trafficking across the border became a concern to the American people, and Mexico was recognized as a threat. Consequently, when the guest worker program expired in 1964, it was not renewed, which caused migration activity to go underground (Fernández-Kelly & Massey, 2007). As with everything else that goes underground, this change left migrants vulnerable to predatory criminal organizations. Migrant conditions continued to worsen, legal entry into the United States remained and still remains difficult to obtain, leaving fewer options for those who depend on their US income. Migrants looking for work often found themselves in the company of people involved in an array of criminal activities, including the drug and arms trafficking organizations, while crossing illegally. The American government continued to target the US/Mexico border as a matter of grave concern, lumping all illegal border activity together as dangerous and costly operations. In the 1970s there was an economic recession in the United States. In reaction to high unemployment, Americans felt threatened by Mexican workers, resulting in the initiative to build the first high security fence (Ellingwood, 2004). The attitude towards Mexican migration had changed for the worse, demonizing those who came to work and associating all trafficking as dangerous and a threat to America and its citizens. Meanwhile, American business owners continued to hire migrants, both of legal and illegal status, and jobs continued to be available for many migrant workers.

From this paradigm emerged a shift in social attitudes towards Mexican and other Latin American foreign nationals. Instead of being seen as a functioning part of American society, immigrants became associated with criminal activity and the presumption that they were taking jobs from able bodied Americans (Fernández-Kelly & Massey, 2007). The
development of anti-immigration groups such as Federation for American Immigration Reform (FAIR), established in 1979, is a clear representation of how the American public views have changed towards Mexican migrants. The hostile anti-Mexican immigration attitude has progressed through the years and has weighed heavily on the US legislation. This hostile and fearful attitude towards migrant populations resonated with many San Diego voters; rousing many to take an offensive position on the issue. The Immigration Reform and Control Act of 1986 (IRCA) hoped to control immigration activity by implementing employer sanctions, increasing control along the border, legalizing immigration to certain areas based on agricultural needs, and criminalizing consciously hiring migrants of undocumented status (Djajić, 1999). For 34 years prior to the IRCA, employers were allowed to knowingly hire undocumented workers under the "Texas Proviso" (Lowell, Teachman, & Jing, 1995). The IRCA attempted and failed to create a harmonious relationship among the land owners in need of agricultural laborers, migrants looking for work, US legislation, and the general public who did not look favorably upon immigration activity—all while minimizing illegal migrant activities. Adversely, IRCA complicated the relationships between laborers, employers, the public, and the US government, creating discrimination and racial profiling targeting Hispanics in the agricultural workforce (Lowell et al., 1995). In the 1990s there was a push, led by San Diego politician Duncan Hunter, to construct a large physical barrier, a great steel fence along the US/Mexico border. The fence is still an issue of scrutinizing focus and great concern in the eyes of the politicians and voters alike. In the last twenty years there has been an increase in attention focused on the US/Mexico border, and all activity continues to be closely monitored and restricted to favor US interests. Funds, manpower, and technology continue to pour into the border region for the purpose of strengthening and advancing security efforts. Nevertheless, people continue to make desperate attempts to illegally cross the border, risking their lives in the hope of finding work and a brighter future for themselves and their families. They continue a cultural tradition, rooted in US policy and legislation, which historically has encouraged the employment of migrant workers.

As a consequence of global politics, many people that lived on the cusp of modern society have been driven further into poverty. As discussed in chapter two, legislation such as the North American Free Trade Agreement (NAFTA) disrupted a sustainable lifestyle,
driving people from rural areas into the cities or into immense poverty (Ganster & Lorey, 2005). Malkin (2009) reasoned, "Local farmers were priced out of the market by food imported tariff-free. Many Mexican farmers simply abandoned their land and headed north." NAFTA promised to create more jobs across international borders, benefit the global economy, and reduce the number of illegal workers in the United States. By reducing or eliminating taxes and tariffs on international trade activity, it created new opportunities for American companies to expand into Mexico, capitalizing on the low cost of labor and relaxed regulations in Mexico. However, mass production of agricultural goods drove prices down, wages fell with the market prices, the Mexican currency was devalued, and economic opportunities changed. US companies built large factories, known as maquiladores, which offered consistent work for a very low, but dependable wage. Large companies realized the opportunities created by the "Free Trade" legislation by outsourcing their production factories to Mexico, paying poor wages, requiring long hours and cutting costs by not having workers rights or environmental standards to comply with as they would have had in the United States (Fernández-Kelly & Massey, 2007). People were drawn from rural areas into the factories, keeping them from their farms, and ultimately making them reliant upon the American and Canadian businesses. Prices of produce dropped, making farming an unsustainable lifestyle. Life in rural Mexico became a constant struggle, and people began to look elsewhere for work (Ellingwood, 2004; Espenshade, 1995; Fernández-Kelly & Massey, 2007; Malkin, 2009). As if following a historical pattern of hostility and fear, Americans felt threatened by the large numbers of legal and illegal migrants looking for jobs in the US. Along with other border regions, San Diego County reacted to the surge in Mexican migration with legislative solutions. Anti-migrant campaigns regained momentum, proposing legal amendments such as Proposition 187 and launching “Operation Gatekeeper.” Proposition 187 was added to the California ballot in November of 1994. The agenda of “Prop 187” was to severely limit undocumented migrants’ accessibility to public benefits. It was an attempt to restrict medical care and education to people of illegal status, as well as hold the general public responsible for reporting people suspected of non-legal status and discouraging illegal migration activity. This initiative did pass, but was found unconstitutional and therefore was never enacted (University of California at Davis, 1994). Although the statute was never implemented, the fact that it was written, put on the ballot,
and passed demonstrates the social tension between migrant populations and California voters. On the same note, “Operation Gatekeeper” was enacted into law by the US Federal Government in 1994, targeting San Diego border regions. It was another method to try to reduce the number of illegal migrants that crossed the San Diego border. This militaristic approach increased the number of border patrol agents to the westernmost sector of the San Diego border, which at the time accounted for a large portion of illegal migrant apprehensions in San Diego and put the US/Mexico border under the Federal Government's microscope (Anderson, 2008; Hinkes, 2008). The rapid transformation of policy changed the dynamics of the San Diego border, pushing the majority of illegal migration flow eastward into the rugged terrain and temperature extremes of San Diego and Imperial Counties and on to Arizona. Prior to 1994, the majority of illegal crossings took place in San Diego County; over half of the total national Border Patrol apprehensions took place in the San Diego sector (Ellingwood, 2004; Hinkes, 2008).

Two years later in 1996 the “Illegal Immigration Reform and Immigrant Responsibility of 1996” was passed. This piece of legislation was initiated to create a database to track entry and exit dates of migrants. When migrants remain in the country past their designated time, they are then red flagged and targeted for removal. Moreover, the legislation implemented harsher consequences for attempting to return home if migrants remained in the country past the expiration date of their visa. In the same year, Congress passed and President Clinton signed into law the "Personal Responsibility and Worker Reconciliation Act," which made illegal immigrants ineligible for all state and federal benefits other than emergency services (Starr, 2007). The topic of immigration reform continues to be a prime target of legislative discussion, and regulations continue to become more and more stringent, yet people continue to cross.

In 2001, the US/Mexico border went through yet another transformation. On September 11, 2001, the United States suffered the worst terrorist attack on American soil in its history. As a result, US citizens and law makers became increasingly paranoid and cautious about who was permitted entrance into the country. Hence, the Homeland Security Act of 2002 was put into action. This piece of legislation reorganized and centralized federal security functions by creating a new branch of the government that incorporates all national and international security concerns. This cabinet-level department is responsible for
everything concerning the United States’ international borders. It oversees customs, immigration, coastguard activities, illegal trafficking of goods and people, along with any other activity that concerns or involves the US border regions. To say the least, border regulations were tightened yet again in the name of fear, in hopes of keeping the citizens of the United States secure (United States Department of Homeland Security [USDHS], n.d.).

Under the Department for Homeland Security (DHS), the Immigration and Customs Enforcement (ICE) Department was created. It is a federal law enforcement agency concerned with immigration and customs violations. ICE is a large department divided into several focused divisions, which together act as a complementary enforcement agency to the Border Patrol and other federal enforcement agencies, with a focus on apprehensions and removals, or deportations, of all those who enter and/or live without proper documentation (United States Immigration and Customs Enforcement [USICE], n.d.). The new aggressive approach to national security provoked changes in immigration policies, limiting access to legal migration and subsequently encouraged more illegal migration, but at an increased level of danger (Andreas, 2003). It became more difficult for people to legitimately enter the US, yet the economic and political situations did not change. Migrant workers were still in high demand, and the need for work did not decrease. Again, there was a resurgence of heavy underground migration. The estimated number of undocumented Mexican nationals has risen exponentially from 2.7 million in 1996 to 10.8 million in 2009 (USDHS, 2009; United States Department of Justice [USDOJ], 2000). Since 2001, deportations of Mexican nationals have nearly tripled, from 189,026 in 2001 to 393,289 in 2008, with 118,712 of those removals taking place in San Diego County (USDHS, 2009). The most current immigration statistics estimate that Mexican nationals account for 72% of all the nation's deportations. Total immigrant apprehensions have increased by 52% since 2001 (USDHS, 2009). Although, to date, these numbers have decreased, the statistics are still valid indications that despite the efforts of the US government to deter people from illegally crossing the border, undocumented migrants continue to take their chances. Increasing law enforcement along the border and building a giant fence does not put an end to illegal migrant traffic; it only makes it complicated and much more dangerous for the working migrant.
With the passage of “Operation Gatekeeper,” migration routes were intentionally redirected to the east. The US government hoped to deter migrants and prevent illegal crossings through increased manpower, technology and overtly advertising these changes by making everything extremely visible. It was calculated that forcing migrants into the much more dangerous environments would dissuade people from attempting to cross illegally and that Border Patrol agents would have a strategic advantage over potential crossers (USDHS, 2010). Realistically, the reasons for crossing outweigh the risks, and people continued and still continue to cross in increasing numbers. The push east just made the journey increasingly hazardous for migrants and Border Patrol agents alike.

Crossing the border in the eastern sections of California and into Arizona presents migrants with a new set of challenges. Instead of just having to evade Border Patrol agents, people now have to survive the unforgiving mountainous and desert terrains. They are frequently unprepared, misguided and often fall victim to the elements. Temperatures in the San Diego county mountains and eastern deserts often range from below freezing in the winter to well over 100 degrees Fahrenheit in the summer. Consequently, death due to direct exposure, such as hypothermia and hyperthermia has become the leading cause of death in migrant fatalities (Anderson, 2008; Hinkes, 2008; Spradley et al., 2008). There are also a number of deaths attributed to the secondary effects of environmental conditions, such as dehydration, suffocation endured while in vehicular transport, and fatal traffic accidents (Hinkes, 2008). This situation has caught the attention of the United States Government Accountability Office (GAO), which stated in a recent report that “since 1995, the number of border-crossing deaths increased and by 2005 had more than doubled. This increase in deaths occurred despite the fact that, according to published estimates, there was not a corresponding increase in the number of illegal entries” (United States Government Office of Accountability [USGOA], 2006).

Despite the growing awareness of the increasing loss of human life correlating with the strengthening of border security, in 2006 another security measure was implemented without precautions. The “Secure Fence Act of 2006” is an initiative set in motion by Congress and President George W. Bush, which called for the construction of a large multi-layered barrier between the US and Mexico. The objective of the act was "[t]o establish operational control over the international land and maritime borders of the United States"
(King, 2006). The fence was required to stretch the entire length of the border, be built immediately, and be armed with state-of-the-art surveillance equipment (King, 2006). The regulations called for cameras and sensors to be strategically placed, based on ports of entry and the traffic flow experienced by each location. Again, migration patterns were altered and the space occupied by illegal traffic was narrowed into more remote areas.

As migrants continued to move east and into more isolated regions, Border Patrol agents followed. They patrolled the dangerous terrain that migrants travelled through regularly, and consequently Border Patrol agents experienced a spike in work-related injuries. In response, the Border Patrol Search Trauma and Rescue, commonly known as BORSTAR, was created to aid the Border Patrol with the escalating incidents reported by agents and migrants alike (U.S. Customs and Border Protection, 2009a). In 1998, following the San Diego Border Patrol sector’s request for permission to develop BORSTAR, the Border Safety Initiative (BSI) was created. The BSI was launched by the Border Patrol as “a comprehensive and aggressive bi-national strategy designed to reduce injuries and prevent fatalities while making the border region safer for migrants, agents, and border residents” (U.S. Customs and Border Protection, 2009a). BORSTAR was approved and implemented as a division of the Border Patrol dedicated to reduce injuries and prevent deaths among agents and migrants alike. BORSTAR agents are specially trained and equipped to respond to high-risk emergency situations. They are responsible for patrolling dangerous areas where the likelihood of death or injury is higher. In addition, they respond to reports of located decedents in situations where access is limited or impossible to access by other agencies. In the last decade they have aided in multiple search and rescue missions and continue to be an important element along the border to help prevent injury and loss of life when possible.

Since the border between California and Mexico was established over 150 years ago, it has gone through a number of changes. The border represents population migration through time and space. Currently, there is an emphasis on controlling and precisely documenting the movement of peoples between politically established borders. Historically, San Diego was the most popular port of entry for people coming from Mexico and parts of Latin America. However, recently there has been a movement in the United States to try and deter illegal immigration through increased security along the border with special attention to
the San Diego sector. Border Patrol presence has doubled and a high-tech massive steel fence has been constructed. Yet, people make continuous efforts to cross. In consequence, the numbers of apprehensions and deportations of undocumented migrants also continue to increase and unfortunately so does the related death toll. Although migrant-related deaths and injuries have increased on a national level, San Diego has been relieved of a portion of their caseload due to migration trends pressing east; yet it is still an issue of grave concern.
CHAPTER 4

GEOGRAPHY

The United States-Mexico Border “stretches 1,951 miles from San Diego, California, to Brownsville, Texas. It is the most frequently crossed international border in the world” (National Immigration Forum, n.d.). This unique stretch of land comprises mountains, deserts, and forests, among other natural and man-made elements, such as the border wall, and irrigation canals. It is the scarcely populated space between the Mexico and US urban centers, and the primary location for undocumented migrants to attempt an illegal crossing into the United States.

GEOGRAPHY OF SECTORS

The US/Mexico border is divided into nine sectors, within four states: California, Arizona, New Mexico, and Texas (Figure 1). Each sector has a designated division of the Border Patrol that works with other federal, state, and local law enforcement agencies. Together these agencies are responsible for maintaining particular border areas. In total, there are 42 entry points between San Diego, California, and Brownsville, Texas. This includes 24 crossing points and 18 other points of entry for commercial vehicles. California hosts six portals between the two countries, three in each of the two counties bordering Mexico. Southern California is split into two sectors which cover the entire 150 mile long California/Mexico border. The San Diego sector stretches half way across California in the southern portion, and then extends up the coastline of the state from the Pacific Ocean to the western limit of Imperial County and up the entire coast of California (Figure 1). The El Centro sector borders the eastern limits of the San Diego sector and stretches all the way to the Oregon border. The portion of the El Centro sector which borders Mexico is located in the southeastern desert of California within Imperial County. Up until 2004 the El Centro and San Diego sectors were limited to the county lines. Sector restructure dissolved all but two California sectors north of the border in order to focus all funds and energy on the border regions. With this restructure, the El Centro sector became the largest in California. While
both sectors experience a high volume of immigration, due to the obvious close proximity to Mexico, the majority of all migrant activity is concentrated within the southernmost counties of these sectors. Although Imperial and San Diego are neighboring counties, the geographic topographies, biological environments, and climates of the Southwest regions are extremely different. San Diego County is made up of coastlines, urban cities, and mountainous forest lands. With climates as different as the topography, San Diego County is an environmentally diverse stretch of land. In contrast, Imperial County mainly consists of rocky desert mountains and sandy arid flatlands, the remnants of an ancient lake bed and is practically barren of all natural resources beneficial to pedestrian travel. From the Pacific coastline to the Arizona border, Southern California is a compact area of extreme climates and terrain complete with every potential environmental obstacle, hazard and advantage.

Both San Diego and Imperial Counties have a history of illegal migrant traffic and have large migrant populations. Changes in legislation have created a shift in migration patterns from the west to the east. These patterns are explored in other chapters of this paper; however, both counties will be discussed in this chapter. Since the focus of the paper is on San Diego County, it is more thoroughly examined than Imperial County.
**Imperial County**

Southern California's Imperial County lies between San Diego County and Arizona. As an extension of the Colorado and Sonoran Deserts, the Imperial Desert, Imperial County, and the city of El Centro comprise a harsh desert terrain located in the southeast corner of California, and the southern portion of the El Centro sector. The Imperial Desert is the remnants of an ancient and historical lakebed and seashore that has seen periods of fruitful waters and periods of lifeless droughts. In historical and contemporary times, Imperial County has always hosted a barren desert with little natural resources to support human life. Inhabitants of the area rely on irrigation and importation of water from the Colorado River, which establishes the eastern boundary of the county. Surrounding the desert floor are mountain ranges with peaks that reach above 4,500 feet, the highest being Blue Angels Peak. At 4,548 feet above sea level this peak lies in the southwest corner of the county only 1/8 mile from the US/Mexico border (OnlineCalifornia.us, n.d.).

Besides the Blue Angels Mountain, other extreme mountain ranges present hazardous obstacles to those trying to cross this desert without the proper supplies. In addition to the rough terrain and the lack of resources, the Imperial Desert offers a false sense of hope due to the numerous canals that water the vast areas of farmland. Many see these canals as easy waterways to navigate their way through the desert terrain, or as a source of desperately needed water. However, the water in these canals can reach dangerous speeds, offering contaminated water filtered through farmlands full of pesticides and other harmful poisons. Another grueling factor is the weather, so common to many desert environments. Temperatures reach well over 100 degrees Fahrenheit in the summer months and below freezing with harsh winds in the winter months. Beyond the physical obstacles encountered while crossing through the eastern limits of California, the time it takes to complete such a journey allows for many more dangerous situations. The threat of more Border Patrol officers occupying the western limits of the California border, imposed by increased funding and attention to national security, pushed migrant routs east, and therefore subjected them to a more lethal path through the Imperial County Deserts. This axiomatic lethal relationship is supported in the mortality statistics following the change in San Diego border operations and the reactionary eastern shift in illegal migration patterns (Anderson, 2008; Hinkes, 2008; Spradley et al., 2008).
SAN DIEGO COUNTY

San Diego County is divided into three different environmental regions: coastal, inland, and the mountains. The temperatures in this county can vary by more than twenty degrees from one end of the county to the other in a single moment. On any given day, it may be raining in the coastal regions while the sun shines brightly in the mountains; it may be snowing in the eastern edge of San Diego, while no more than a sweater is needed on the coast. The eastern and western limits of the county are less than 100 miles apart, but the climates can be a world apart. The westernmost portion of San Diego has a relatively consistent and comfortable climate year around. With average temperatures hovering in the mid 60s Fahrenheit owing to a regular marine layer, the coastal region is a rather mild and ideal climate. As one moves east the terrain changes drastically, going from sea level through the inland valleys to mountain peaks. The inland region is primarily a collection of valleys and mesas, which are very densely populated areas with local amenities, minimizing the possibility of migrant deaths related to environmental factors. However, "Just 20 miles east of the Pacific Ocean, San Diego County becomes a land of rugged, remote topography with mountain peaks exceeding 6,000 feet" (Hinkes, 2008). The Cuyamaca and Laguna Mountain ranges are located in eastern San Diego County; these mountainous terrains are two different ranges set fairly close together and are for the most part included as part of the Cleveland National Forest. Steep cliffs, valleys, lakes, and small towns separate them. The Laguna Mountains occupy the more eastern region of San Diego with more extreme temperatures and equally extreme terrain with peaks as high as 6,378 feet. The Cuyamaca Mountains also have very high mountaintops, reaching 6,512 feet, and experience levels of extreme weather from the peaks to the floors of the mountain range. Although the Cuyamaca Mountain Range has the highest peak in the region, the majority of the mountain range lies at a lower average elevation than its eastern neighbor, the Laguna Mountains. Due to this lower elevation, the Cuyamaca Mountain Range is generally warmer than the Laguna Range year-round. Both mountain ranges are covered in dense vegetation varying with the elevation. Vegetation in the mountain ranges vary by elevation to include, low shrubbery, dense chaparral, poison oak groves, grassy fields, and magnificent oak trees. The climate is just as extreme as the terrain, with temperatures frequently reaching over 100 degrees in the summers, and dropping below freezing in the winters, with snow storms in the winter, and
forest fires in the fall. The geography of San Diego County can be unforgiving and the further east one goes the harsher the terrain becomes.

In addition to the forests of San Diego, the In-Ko-Pah Mountain Range is on the border of San Diego and Imperial counties. The In-Ko-Pah Mountains are located east of the Lagunas, a desert habitat consisting of large granitic boulders with little vegetation or water. Mount Tule is the highest peak in this range at 4,647 feet. Extreme temperatures are experienced in both the winter and the summer months. Due to the climate and the instability of the granitic boulders, rattlesnakes, cacti, and other natural obstacles, the In-Ko-Pah area is extremely dangerous, yet undocumented migrants frequently travel it. The Jacumba Mountain Range is the easternmost mountain range in San Diego County. It too borders Imperial County, southeast of the In-Ko-Pah Range, and northeast of the border town of Jacumba. This is the smallest of the mountain ranges discussed, stretching approximately ten miles north to south, with the highest peak at 4,089 feet. It is also frequented by migrants in the first stage of their stateside journey. The climate is similar to In-Ko-Pah, but the vegetation is more abundant, consisting of dense chaparral forests. All of these mountainous regions in San Diego County pose a threat to migrants traveling without proper supplies and direction. It can take a rough two-day hike or more to reach a highway from the border and easily catch an unsuspecting migrant off-guard and ill-prepared (Hinkes, 2008).

Prior to Operation Gate Keeper and similar Homeland Security legislative changes that redesigned the focus of California Border Patrol efforts, the most popular route for undocumented migrants to travel was the more agreeable coastal regions. Up until that point, the most frequent causes of death for undocumented migrants were drowning and car accidents (Hinkes, 2008; USGOA, 2006). Currently, the routes favored are in the eastern limits of San Diego County, and further east into the deserts of California, Arizona, and Texas. Environmental circumstances not only present a challenge to migrants, but also to law enforcement and accompanying agencies. Because migrants are using harsher, more dangerous paths, rescues become more difficult and communication more limited; upon death, locating and recovering the body can take days, weeks, months, or years. Needless to say, these circumstances are unfavorable to the proper and speedy identification of an individual; therefore, officials tasked with the challenge of identification and repatriation must use all available resources and rely on technology to aid in their success.
CHAPTER 5

DEMOGRAPHICS

The population(s) explored for this paper is the community of immigrants attempting to cross the US/Mexico border under undocumented or illegal status. In order to predict the appropriate forensic methodology to apply to this population in death, we must understand the demographic profile of the living migrant populations that are most likely to become unidentified deceased migrants. Variables referenced include apprehension rates, legal residency rates, estimations of illegal residence, country of origin, deportations, and the death rates reported along the US/Mexico border. "The US-Mexico Border stretches 1,951 miles from San Diego, California, to Brownsville, Texas, from the Pacific Ocean to the Gulf of Mexico. It is the most frequently crossed international border in the world” (National Immigration Forum, n.d.). Those who cross this border are citizens from countries around the globe, but an overwhelming majority are Mexican nationals (Anderson, 2008; Hinkes, 2008; Spradley et al., 2008; USDHS, 2009). Statistically, it is likely that deceased individuals located within the southwestern region of the US and are suspected of being unauthorized migrants are of Mexican nationality. However, the undocumented migrant population includes foreign nationals from countries other than Mexico and those variables will be discussed as well (USDHS, 2009, 2010). Understanding these demographics is a minor advantage to the professionals who are responsible for identifying and repatriating unidentified, undocumented deceased migrants.

In addition to Mexico, a few countries of Central America rank high in the overall contribution to the US's Latin American migrant population, and therefore all Central American countries will be included in the demographic profile. Due to the fact that Mexican nationals are the majority, the only government to government relationship discussed will be that of Mexico and the US in hopes of better understanding the legal and pragmatic roles of foreign Consulates, as well as the existing protocol and practice pertaining to the repatriation of foreign nationals who die within US boundaries.
Migration patterns are always changing, constantly producing new statistics followed by analyses. As mentioned in previous sections many factors, including economics and social and political stability affect migration patterns. However, social and political conditions are difficult to measure and therefore will be mentioned as factors, but not included in the statistical presentation of the migrant demographic profile.

METHODS

The true number of people who enter the US illegally is unknown. In general, there is believed to be a statistical correlation between legal and illegal migration patterns. This is not to say that one is in direct relation with the other, but the number of legal entries and apprehensions of undocumented migrants are an indication of the number of individuals who may have successfully penetrated the United States/Mexico border illegally (Espenshade, 1994; Fernández-Kelly & Massey, 2007). However, the Department of Homeland Security (DHS) states that "The relationship between the number of border apprehensions to either the number of attempted illegal entries or the number of successful illegal entries is unknown" (Sapp, 2011). Due to this juxtaposition, "deportable aliens" and "apprehensions" will be discussed appropriately alongside legal and illegal migration patterns as a method of trying to understand the demographic makeup and population patterns of migrants who enter the US via the Southwest, potentially becoming migration-related casualties.

The Southwestern regional sectors of the US/Mexico border, which include the border regions of California, Arizona, New Mexico, and Texas, facilitate the majority of the Nation’s “deportable aliens” and migration-related apprehensions. Until deportation occurs, there is no delineation of those who enter and are seized under criminal motives, and those who cross under peaceful pretenses. All foreign nationals taken into custody for US immigration policy violations are unbiasedly accounted for as "apprehensions" or "deportable aliens" and reported in the statistical analyses accordingly. "Deportable alien" is a term used by DHS referring to people who are apprehended by Border Patrol (BP) or administrative arrests made by the Immigration and Customs Enforcement (ICE) (USDHS, 2010, p. 91). "Apprehensions" refers to individuals who are thought to be of illegal status, and are taken into custody by BP, ICE, or another law enforcement agency. The term refers to the act of arrest rather than the number of individuals detained, and usually takes place near the border
as one attempts an unauthorized entry (Sapp, 2011). These two statistical categories overlap where the apprehended become "deportable," by reason of illegal status. The majority of those incorporated into the "apprehension" statistics are a result of Border Patrol activity; this statistic reflects migrants in transit, who are more likely to become part of the undocumented, and unidentified, decedent population.

For this study the majority of the statistical information utilized is from 2001 through 2010 and earlier when available. All data is presented on a fiscal year calendar (October to October) as per the practice of the referenced government agencies.

**CURRENT MIGRATION TRENDS**

The US is built on migrant communities, and the global perception of the US being "The Land of Opportunity" has not changed. Although immigration is a difficult and costly process, it is not a strong deterrent. Those who are not able to obtain legal documents to enter the US may continue to pursue entrance through alternative means. The profile of an average migrant crossing from Mexico to the United States has not seen any drastic, long-lived changes in the history of the border's existence. However, since the initiation of "Operation Gatekeeper" in 1994, and the subsequent increase in border security, the methods and routes by which illegal entries are made have significantly changed and consequently so have many of the statistics related to these entries (Hinkes, 2008; Spradley et al., 2008; USDOJ, n.d.b; USGOA, 2006). Currently, San Diego authorities continue to document plenty of migrant traffic, yet in redefined patterns. The following sections will look at statistics related to illegal migration on a national, state, and local level, attempting to obtain a comprehensive understanding of the undocumented migrant profile present in San Diego County, in both life and death.

**National**

Every year the United States receives more than a million immigrants from all over the world. In 2011 nearly 1.1 million people were granted legal permanent residency, which is an accurate representation of the immigration trends experienced by the United States over the last twenty years. Of the total number of foreign nationals who were granted permanent residency from 2002-2011, with Mexican nationals representing over 15% of the
accumulative total. Moreover, Mexico accounts for the highest number of legal residents from a single country and provides the majority of all migrants from Latin America. (See Table 1, USDHS, 2011, Table 2). El Salvador and Guatemala are the next largest national groups seeking residency, but at a much lower rate. (See Table 1 for permanent residency by country of origin for North and Central America along with comprehensive data for South American nationals). As addressed previously, Mexican nationals are known to be the largest group of people seeking residency in the United States and consequently those who are not granted legal access into the country may seek out alternative methods of illegal entry. Not surprisingly, Mexico has an overwhelmingly high rate of apprehensions and returns compared to any other single nation. In 2010, returns to Mexico accounted for nearly 75% of the national total number of individuals returned to their country of legal residency by US agencies (See Figure 2) (USDHS, 2010). Guatemala, El Salvador, and Honduras follow Mexico in apprehensions, removals, and residencies but at significantly smaller rates (See Figure 2; Table 2).

As discussed in Chapter three, the United States experienced a devastating terrorist attack by foreign nationals in 2001. As a reaction to the fear of unsecured borders, the United States Government formed the Department of Homeland Security. A major responsibility of the new department was to oversee immigration and all other border activities. Therefore, there were a number of changes to the US immigration documentation procedures. Prior to the advent of the DHS, immigration statistics were not kept in the detailed manor that they have been since 2001. In contrast to the annual reports currently issued by the DHS, immigration statistics used to be published in ten-year increments and in little detail by the Immigration and Naturalization Service (INS). Statistical analyses of legal entries by year and country of origin along with apprehensions, deportations, and criminal removals are currently part of the DHS annual report and available from 2001-2011. However, from 2001 to 2005, the DHS worked to develop a standard method of documenting and reporting immigration related information, and until 2006, the method of reporting immigration statistics varied year to year. This process of developing protocols for reporting information to the newly formed DHS is seen in multiple agencies (federal, state, and local) by the inconsistencies in the information addressed, and how the statistics are presented. Therefore, information available to the public is not consistent until around 2006 and
### Table 1. Legal Residence

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
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<th>2011</th>
<th>Total</th>
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<td>1266129</td>
<td>1052415</td>
<td>1107126</td>
<td>1130818</td>
<td>1042625</td>
<td>1062040</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4028</td>
<td>38.0%</td>
<td>2499</td>
<td>19%</td>
<td>3423</td>
<td>83</td>
<td>3454</td>
<td>76</td>
<td>4139</td>
<td>92</td>
<td>3392</td>
</tr>
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<td>20.7%</td>
<td>1155</td>
<td>85%</td>
<td>1754</td>
<td>11</td>
<td>1614</td>
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<td>1737</td>
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<td>1486</td>
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<td><strong>Belize</strong></td>
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<td>588</td>
<td>0.1%</td>
<td>871</td>
<td>0.1%</td>
<td>876</td>
<td>0.1%</td>
<td>1252</td>
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<td>1073</td>
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*(table continues)*
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<thead>
<tr>
<th>Country</th>
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<th>1892</th>
<th>1681</th>
<th>2413</th>
<th>1790</th>
<th>1618</th>
<th>1218</th>
<th>1046</th>
<th>1109</th>
<th>1582</th>
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<tr>
<td>Guatemala</td>
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<td>2.0%</td>
<td>1.5%</td>
<td>1.9%</td>
<td>1.7%</td>
<td>1.5%</td>
<td>1.1%</td>
<td>1.0%</td>
<td>1.0%</td>
<td>1.5%</td>
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<td>0.4%</td>
<td>0.3%</td>
<td>0.4%</td>
<td>0.3%</td>
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<td>0.3%</td>
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<tr>
<td>Honduras</td>
<td>0.6%</td>
<td></td>
<td>0.6%</td>
<td>0.6%</td>
<td>0.6%</td>
<td>0.7%</td>
<td>0.6%</td>
<td>0.6%</td>
<td>0.6%</td>
<td>0.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>0.2%</td>
<td></td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.2%</td>
<td></td>
</tr>
<tr>
<td>Panama</td>
<td>0.2%</td>
<td></td>
<td>0.2%</td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.2%</td>
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<td>0.2%</td>
<td>0.2%</td>
<td>0.1%</td>
<td></td>
</tr>
<tr>
<td>El Salvador</td>
<td>2.9%</td>
<td></td>
<td>4.0%</td>
<td>3.1%</td>
<td>1.9%</td>
<td>2.5%</td>
<td>2.0%</td>
<td>1.8%</td>
<td>1.8%</td>
<td>1.8%</td>
<td></td>
</tr>
</tbody>
</table>

(table continues)
| South America | 7414 | 5 | 7.0% | 5502 | 4 | 7.8% | 7205 | 7 | 7.5% | 1031 | 27 | 9.2% | 1379 | 71 | 10.9% | 1065 | 16 | 10.1% | 9854 | 9 | 8.9% | 1028 | 60 | 9.1% | 8717 | 8 | 8.4% | 8609 | 6 | 8.1% | 9235 | 24 | 8.8% |
|---------------|------|---|------|------|---|------|------|---|------|------|---|------|------|---|------|------|---|------|------|---|------|------|---|------|------|---|------|------|---|------|

*These stats compare the legal residence in the US who are foreign nationals of North American countries and the total volume of legal residence from countries all over the glob

<table>
<thead>
<tr>
<th>North American Stats**</th>
<th>North American Stats**</th>
<th>North American Stats**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>2188</td>
<td>22</td>
</tr>
<tr>
<td>Belize</td>
<td>966</td>
<td>0.2%</td>
</tr>
<tr>
<td>Guatemala</td>
<td>1617</td>
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</tr>
<tr>
<td>Honduras</td>
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<td>Costa Rica</td>
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<td>0.4%</td>
</tr>
<tr>
<td>Panama</td>
<td>1680</td>
<td>0.4%</td>
</tr>
<tr>
<td>El Salvador</td>
<td>3100</td>
<td>6</td>
</tr>
</tbody>
</table>

(table continues)
Table 1. (continued)

** These stats reflect legal residence that are from North American countries only. Countries of origin are identified separately and are statistically compared to the total number of legal residents who are from North America.

## Table 2. Returns 2010

<table>
<thead>
<tr>
<th>2010 Stats</th>
<th>Mexico</th>
<th>Guatemala</th>
<th>Belize</th>
<th>El Salvador</th>
<th>Honduras</th>
<th>Nicaragua</th>
<th>Costa Rica</th>
<th>Panama</th>
</tr>
</thead>
<tbody>
<tr>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>#</td>
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<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td><strong>Legal Residency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1301</td>
<td>1046</td>
<td>96</td>
<td>1880</td>
<td>6448</td>
<td>356</td>
<td>216</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>1.1%</td>
<td>0.6%</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>38.7%</td>
<td>3.11%</td>
<td>0.3%</td>
<td>5.6%</td>
<td>1.9%</td>
<td>356%</td>
<td>216%</td>
<td>133%</td>
<td></td>
</tr>
<tr>
<td><strong>Deportable Aliens</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4279</td>
<td>2206</td>
<td>10</td>
<td>1852</td>
<td>1789</td>
<td>134</td>
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<td>75</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>8</td>
<td>9</td>
<td>0.02%</td>
<td>3.6%</td>
<td>134%</td>
<td>0.05%</td>
<td>0.01%</td>
<td></td>
</tr>
<tr>
<td>82.7%</td>
<td>4.3%</td>
<td>0.02%</td>
<td>3.6%</td>
<td>3.5%</td>
<td>134%</td>
<td>0.05%</td>
<td>0.01%</td>
<td></td>
</tr>
<tr>
<td><strong>Returns</strong></td>
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<td>3549</td>
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<td>909</td>
<td>121</td>
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<tr>
<td>82</td>
<td>0.5%</td>
<td>0.01%</td>
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<td>0.3%</td>
<td>0.04%</td>
<td>0.03%</td>
<td>0.02%</td>
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</tr>
<tr>
<td>74.5%</td>
<td>52%</td>
<td>0.01%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>0.04%</td>
<td>0.03%</td>
<td>0.02%</td>
<td></td>
</tr>
</tbody>
</table>

*Legal Residence in US originating from North American Countries other except Canada

% is in reference to USA totals for fy2010


continues to change as legislation influences alterations in priorities. In many cases when one agency lacks information for a particular variable or year, another agency has reported it and therefore filled in the gaps of information available. For example, estimations of illegal residents were reported consistently from 2005 through 2010 and in 2000 by the DHS, while 2001-2004 were not individually accounted for. But, the statistical information is available to the public, because Pew Research Hispanic Center has produced annual estimations of illegal residence (See Figure 2).

When estimating the number of people who enter the United States illegally, there are many factors to consider, and each agency uses its own set of factors. The US Government has developed a mathematical equation for estimating the number of illegal residents. The estimated product is achieved by subtracting the total foreign-born population living in the United States, as reported by the census, from the population of “legal residence” status (Hoefer, Rytina, & Baker, 2011). DHS used this formula to estimate the population of undocumented migrants in 2010 to be 11.6 million (Hoefer et al., 2011). Pew Hispanic Center estimates that the US has seen a steady increase in undocumented residents from
2000, peaking at 12 million in 2007. From there, the illegal population has slightly declined with an estimated 11.2 million in 2010 (See Figure 2; Pew Research Hispanic Center, 2011). In a similar trend, global economies were on a steady incline until around 2008 when economies began to plummet. According to the International Monetary Fund, in 2008 a global recession began, impacting economies across the world. The United States, Mexico, and surrounding countries were no exceptions (Wakeman-Linn, Portilla, Issifov, & Milkov, 2009). A study by the Center for Immigration Studies (CIS) reports a link in immigrant unemployment and immigration numbers, suggesting that migration numbers have been falling slightly due to changes in national and international economies (see Figure 3, Camarota, 2012; Center for Immigration Statistics, 2012). This study demonstrates that the unemployment rate affects migration patterns, as unemployment goes down, migrant residency increases, and the opposite effect is seen when unemployment rates increase. Often migrant population numbers follow social and economic stimulants, resulting in
immigrant populations fluctuating through time. Moreover, migration trends are argued to have periods of ups and downs, reflecting Mexico and/or US economic patterns. According to the Federal Bank of Dallas research, a declining number of apprehensions at the border are not due to enforcements, rather they mirror economic cycles (Jimenez, 2009; USGOA, 2006).

In addition to economic deficiencies and legal residence estimations, the number of apprehensions is believed to provide insight into the number of undocumented migrants who cross into the United States. From 2001 through 2010 the Border Patrol was responsible for locating 91% of the nation’s “deportable aliens” with nearly 98% of those apprehensions taking place in the Southwest sectors; of those, 21.3% in California, while Arizona had the majority with 45.6% (See Table 3).

Migration trends of populations of both illegal and legal status continue to change as fast as they are reported. Moreover, following general patterns, migrant-related deaths have decreased in the western sections of the Southwest sectors while eastern regions have

---

### Table 3. US "Deportable Aliens" 2002-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>National Total*</th>
<th>San Diego Total</th>
<th>San Diego BP Apprehensions</th>
<th>San Diego ICE Apprehension</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
</tr>
<tr>
<td>1992</td>
<td>1,258,481</td>
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<td>1993</td>
<td>1,327,261</td>
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<td></td>
</tr>
<tr>
<td>1994</td>
<td>1,094,719</td>
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<tr>
<td>1995</td>
<td>1,394,554</td>
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</tr>
<tr>
<td>1996</td>
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<tr>
<td>2000</td>
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</tr>
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</tr>
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Table 3. (continued)

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increased (E. Morones, personal communication, August 20, 2012; Eschbach, Hagan, Rodriguez, Hernandez-Leon, & Bailey, 1999; Hinkes, 2008; Spradley et al., 2008; USGOA, 2006).

**State-California**

The US/Mexico border has become an area of great concern to national security over the last decade and a half. The number of personnel working on and around the border has increased drastically along with advancement in security equipment and stricter regulations. California received the bulk of the attention, with much of the governmental concerns resting within the San Diego sector. Change in border practices prompted a shift in California's border activity patterns, pushing migrants towards the east, with a reflective change in statistical data. After 9/11 California experienced a small decline in apprehensions from 2001–2005, then a steady incline until 2008 and is currently experiencing another small pattern of declining apprehensions (See Table 4). Since 2001, California sectors have been responsible for an average of 21% of all immigration enforcement apprehensions in the US, with 22% of the total for the California sectors occurring in the Southwest sectors.

In the last ten years, the demographic profile of the United States immigrant has changed on a national level, but the Southwest sectors continue to report little change to the collective statistical profile of immigrants crossing through these regions. Although California is a popular point of entry for immigrants, few people stay. In 2010, San Diego's apprehension rates were just above 13% (see Table 3), yet according to the DHS and CIS, the estimates for legal residents in San Diego are just under 2%, while approximately 25% of all legal aliens living in the US reside in California (USDHS, 2010; Camarota, 2012). The ultimate destinations and agendas of undocumented migrants vary, taking them to a number of places in the United States. Many people typically come for work, head north to the
### Table 4. Apprehensions 2001-2010

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<td><strong>SW Sector</strong></td>
<td>97.6%</td>
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<td>98.5%</td>
<td>98.4%</td>
<td>97.9%</td>
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(table continues)
Table 4. (continued)

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<td>San Diego Sector</td>
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<td>El Centro Sector</td>
<td>14.0%</td>
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<td>28.8%</td>
<td>28.1%</td>
<td>22.6%</td>
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</tr>
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</table>

agricultural areas of Los Angeles County and return home when possible. Yet in order to reach their destinations, all migrants must first cross the border, evade enforcement agencies, and ultimately survive the journey.

**Local-San Diego**

The apparent change in the geographical redirection of illegal migrant traffic favors regions east of San Diego, but does not exempt San Diego County. Historically, San Diego has been targeted as a problem area, resulting in significant increases in the man power and technology allotted to border security. Prior to the heavy legislative changes that began in the mid 1990s, San Diego experienced some of the highest volume of migrant traffic and subsequent fatalities (Anderson, 2008; Ellingwood, 2004; Hinkes, 2008; Spradley et al., 2008). Migrants have entered the US by aquatic and terrestrial means: walking and swimming across, relying on boats, rafts, busses, trucks and cars to carry them across and more recently using jet skis to cross via the ocean (E. Morones, Personal Communication, August 20, 2012). San Diego was the ideal port of entry for many reasons, it offers many modes of entry and is located near populated areas which could not only facilitate a speedy entry, but emergency personnel can respond quickly if needed. In reaction to the bulking of the border deterrence, illegal migrant traffic has shifted to the less populated eastern routes. These trends are supported by the DHS and the CIS, demonstrating the change in immigration trends as a geographical shift resulting in increased danger and increased death rates among undocumented migrants. Death rates will be discussed later this chapter.

One would think that the apprehension rate would reflect the shift in migration routes. With more people traveling eastern routes a rise in apprehensions and deportations in the eastern limits of the border would be expected. However, according to the numbers published by the Border Patrol, there seems to be a rise in apprehensions in San Diego since 2001 (See Table 4). This is not to say that the manpower of the Border Patrol has not dissuaded some people from crossing illegally, but the statistics show that people do continue to challenge the border security in San Diego and all border regions alike. From 2002-2010, San Diego has been responsible for 13% of the apprehensions and 12% of the nation's "deportable aliens", inferring that most of the apprehensions that occur in San Diego lead to deportations (see Tables 2 and 3). According to the yearly report produced by the
Department of Homeland Security, the San Diego sector has experienced an increase in the number of “deportable aliens” recorded. The numbers went from 8% of the nation's total in 2000 and 2001 to nearly 20% in 2009. This jump can be described with two opposing arguments: first, the increase in Border Patrol agents and increased technology is effectively catching unauthorized migrants; second, the increase in force has not discouraged people from attempting to cross the San Diego border, in contrast more are attempting to enter via the San Diego sector. Nevertheless, the number of migration-related deaths has increased on a national level, yet due to the eastern push, has decreased within the San Diego sector in the last decade. However, the problem has not been solved; deaths continue to occur in the deserts of the Southwest.

**Migration Related Deaths and What Follows**

The regional distribution of migration-related deaths supports the accepted theory that there has been a large movement of illegal crossings, focused east of San Diego, primarily in the deserts of Arizona. For the purpose of this paper, the discussion focuses on San Diego statistics but does not exclude other pertinent areas.

In the mid 1990s, the systematic militarization of the border began with the main focus being on San Diego County borders. In reaction, apprehensions’ rates of "deportable aliens" increased while immigration flow decreased along with the number of nationally reported border-crossing related deaths (See Table 5). However, the correlation between the heightened security and the decline in migrant related deaths is not a simple cause and effect relationship. According to the department of Homeland Security, since a spike in migrant deaths in 1988, there had been a steady decline of border-crossing related deaths occurring in San Diego County. From 1990 to 1994 a steady decrease in deaths is documented in the county, then in 1995 we see a small spike in deaths, followed by a stable diminution with only minor variances through 2005 (Eschbach et al., 1999; USGOA, 2006). Border-crossing related deaths continue to decline in San Diego County, yet are on the rise elsewhere. Deserts in Arizona through Texas have seen increased illegal border activity and the accompanying increase in related fatalities.

According to the Government Office of Accountability (GOA), as of 2005 the number of migrant related deaths has more than doubled since 1995 (USGOA, 2006).
Table 5. Reported Deaths 1993-2011

<table>
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<th>Year</th>
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<th>SD Deaths reported by GOA</th>
<th># of Reported Deaths by SDBP</th>
<th># of Deaths reported by SDME</th>
<th>Death by Exposure SDME</th>
<th>Doe Unknown COD*</th>
<th>Doe Accidental Death</th>
<th>Doe Natural Death</th>
<th>Doe Suicide or Homicide</th>
<th>UnDM Deaths</th>
<th>UnDM Unknown COD</th>
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Table 5. (continued)

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*Cause of Death (COD)

Adapted from: USGOA, 2006; Wagner, 2011; San Diego Border Patrol, personal communication, 2012
Enrique Morones of "Border Angels" (a San Diego based humanitarian and migrants’ rights group) argues that the number of deaths has increased nearly twofold since the push east. Morones has been active in the migrant community for over 25 years and has watched the numbers go from one to two individuals a month reported lost or deceased, to nearly one or two reports a day (E. Morones, personal communication, August 20, 2012). The fact that border crossing related fatalities have increased, since the initiation of major changes in immigration enforcement legislation, is widely excepted by government agencies, law enforcement, humanitarian groups, and academic professionals alike (E. Morones, personal communication, August 20, 2012; Anderson, 2008; Hinkes, 2008; USGOA, 2006). Exact statistics supporting this data are difficult to produce because many of the individuals are yet to be identified and the data between agencies is not always congruent (Eschbach et al., 1999; Peachtree, 2012) In an attempt to estimate the number of border-crossing casualties and demonstrate the relationship between unidentified human remains (Does) and reported migrant casualties, a graph (see Figure 4) displays the number of Does reported by the San Diego Medical Examiner's Office (SDMEO), the number of identified "Undocumented Migrant" deaths (UnDM), the number of border deaths reported by the San Diego Border Patrol (SDBP), and the number of San Diego border-crossing deaths from 1993-1997 reported by the GOA. The SDMEO only reported UnDM deaths for a short time, while the SDBP was only able to account for migrant deaths from 2004 to 2012. These figures can seem to be inconsequential, but since 1996 there has been a general decline in the Doe cases and UnMD deaths, as reported by the SDMEO. However, when data is available for statistics related to both the UnDM deaths and Doe counts, as reported by the SDMEO (2000-2006), they result in opposing trends; when UnDM deaths increase, Doe counts decrease, and vice versa. The only year that does not fit that trend is 2001, when both counts decreased from the previous year. This relationship can be seen as a cause and effect: the more identifications made, the fewer Does are reported, regardless of nationality and political status. Also, the death rates reported by the SDBP follow the pattern of the UnDM statistic, but consistently report lower counts, demonstrating that these reported numbers are representing the same population of deceased migrants. The deaths reported by the SDBP only consider the cases handled by the SDBP, and therefore it is likely that their count is lower than the actual number of border deaths in San Diego seen by the SDMEO. The years
2004–2006 demonstrate the differences in the number of migrant deaths reported by the SDBP and those accounted for by the SDMEO. Due to this relationship, data from one of these two sources can be used as reference to the other in years where data is not available for both variables.

Other variables considered are the number of deaths reported by the SDMEO that due to the inability to identify combined with the manner of death, could account for deceased migrants. Since the majority of migrant-related deaths are accidental and largely due to exposure to the elements, "death by exposure" was considered as a variable (See Table 5). Also, many migrant fatalities are not located promptly and can become skeletal remains by the time of discovery. Death by exposure does not leave evidence on skeletal remains and therefore many can be considered "unknown" causes of death. Data accounting for "unknown" cause of death for Doe cases, and "skeletal" remains are also considered when looking at potential counts of deceased migrants, but the annual report the SDMEO does not differentiate between skeletal remains that have been identified, and those which remain Doe cases (See Table 5). Additional statistics regarding the cause of death of unidentified deceased migrants and Does have been calculated in hopes of presenting a more comprehensive profile of undocumented migrants who end up in the SDMEO, either as an unidentified migrant, Jane or John Doe, or a deceased foreign national (Table 5). Although

![Figure 4. San Diego reported deaths 1993-2011.](image-url)
an accurate count of illegal migrants who enter the US and the number of those who perish while crossing is unknown, by looking at immigration and related death statistics a good approximation can be concluded.

**CONCLUSION**

Over the last decade and a half migration patterns have changed. The passing of "Operation Gatekeeper" in 1994 initiated a grand shift in illegal migration, pushing people east. The newly favored eastern routes present migrants with a new set of environmental challenges. The arid deserts of eastern California, Arizona, and Texas prove too difficult for many, resulting in a significant increase in border-crossing deaths. Although San Diego has experienced a decline in migrant deaths, the nation has seen the total more than double since the inception of “Operation Gate Keeper” and the subsequent DHS (Anderson, 2008; Eschbach et al., 1999; Hinkes, 2008; USGOA, 2006). Although decedents originate from various countries south of the US/Mexico border, Mexican nationals continue to be the largest population who cross the US southern border. Understanding the demographics of the migrant populations entering through the Southwest can aid legal agencies and medico-legal personal, such as forensic anthropologists, in the identification process, leading to the ultimate goal of repatriation.
CHAPTER 6

DISCOVERY AND RECOVERY

Upon death, locating an individual is a critical first step in ensuring that a decedent is processed through the proper agencies to ensure the timely release of the remains to the family. Locating deceased illegal migrants poses an extra challenge to authorities. Since undocumented migrants do not want to be detected in life, in death they are regularly found in obscure locations and without identification. The discovery of human remains is brought to the attention of law enforcement through an unanticipated encounter by Border Patrol agents or civilian informants. Once appropriate law enforcement agencies are notified of the existence and location of human remains, the process of recovery and analysis begins. All cases of inadvertent discovery of human remains are under the jurisdiction of the San Diego Medical Examiner's Office (SDMEO), and the local law enforcement. Depending on who discovers the remains, the process of alerting the SDMEO may vary.

Upon location of human remains the first step is always to secure the scene. It is proper protocol to ensure that evidence at the location of a body be preserved until the site can be fully processed by forensic technicians, or cleared of criminal interest. As with the recovery of all human remains, attention to detail and the collection of all available evidence is crucial. Due to the political status of the remains, any information pertaining to the decedent is limited to the evidence located on or around the body. In cases of incomplete skeletal remains, it crucial to collect as much skeletal and material evidence possible. During the most extreme seasons, winter and summer, nature takes a toll on all the evidence left behind. During the hot summer months, human remains quickly decompose. Within days, a body can become putrefied or mummified, destroying physical evidence and producing an altered appearance which hinders visual identification. In the winter, the frigid temperatures, snow fall, and heavy rains can conceal, wash away, or alter the visual state of a body. In every season, scavenger activity can destroy, disarticulate, and disburse the remains over a large area, creating greater difficulties in complete recovery and lost information. The longer remains go without being discovered, the less likely identification documents will be found.
Forensic anthropologists rely on the skeletal evidence to generate a biological profile that may aid in the identification of the individual, highlighting the importance of a thorough recovery effort.

**METHODS**

As of 2013, an official standardized method of reporting and documenting deceased migrants does not exist across agencies, nor is such a standardized method available for reference on how the general public is to report located remains. Neither is there a comprehensive procedure for reporting lost or missing migrants. One may assume that all parties would contact the police, but surprisingly public response to the discovery of human remains in remote locations varies.

Both American citizens and foreign nationals are commonly responsible for providing information leading to the location of deceased migrants. Given the terrain migrants travel through, most of the discoveries made by US civilians are made by recreational hikers, off roaders, or environmental surveyors. Sometimes, surviving migrants in the decedent's group contact authorities, known humanitarian groups, or family members, informing them of a fallen party member. US civilians respond in a variety of ways, depending on the location and the nature of the activity that is taking place when an inadvertent discovery of human remains is made. People involved in recreational activities generally respond by calling the local law enforcement agencies, while professionals who commonly work in these areas, such as environmental surveying teams often have an in-house policy pertaining to such discoveries. They may inform the SDMEO directly, contact the Border Patrol, or call the local law enforcement, depending on their individual experience. Once notified, each law enforcement agency has its own methods of handling deceased migrant cases, yet the SDMEO is always informed. Upon notification, the SDMEO investigators prefer to travel to the location of discovery, and collect the remains themselves. (G. Geary, personal communication, 2008). By going to the site, SDMEO investigators are able to evaluate the circumstance and determine if the case is possibly criminal or not, and make an initial observation as to the legal and political status of the individual. Also, evidence is collected, a chain of evidence and cohesive paper trail is established, and a comprehensive investigation takes place as recovery begins.
Civilian Discoveries

Civilian discoveries occur when people who are not affiliated with any type of law enforcement or military agency discover human remains. This category can be split into three major groups of people who encounter human remains more frequently in the obscure areas of San Diego county: survey crews, recreationalists, and humanitarian activists.

Survey Crews

Survey crews are generally private companies that explore remote areas, observing and analyzing the land for environmental and developmental concerns. Developmental and environmental surveys often take place in concert with each other, as development is limited by environmental regulations and environmental impact is influenced by development. Both groups are regularly creating boundaries for new developments and are therefore often working in undeveloped and unfrequented lands. Developmental surveys are generally conducted by specialized survey crews that are either gathering topographic data for engineers or marking the boundaries for anticipated development. Environmental companies address cultural and biological resources, exploring the wilderness of San Diego to identify and address these resources. Developmental and environmental companies generally employ their own company specific, legal protocol for the discovery of human remains. San Diego's legal procedure, in compliance with California's Health and Safety legal statute, is limited to the act of notifying the SDMEO (California Health and Safety Code Section 7050.5-7055, n.d.). Any other means of documenting the discovery is private protocol or standard operating procedures (SOP). According to the author's personal experience as a field archaeologist and environmental monitor, some SOPs, implemented by private companies, include recording the location, specifying condition of remains, and notification of the legal authorities. Also, most companies encourage documentation of a general description of the findings and a relevant Global Positioning System (GPS) point to aid the SDMEO in locating the remains at a later time. Some companies that have experience working in the back country of San Diego County will normally call the SDMEO directly, since they are accustomed to the preferred procedures of notification. The SDMEO does not always have the time or the resources to respond immediately, so the information given to them by the survey crews is often the only means to locate and recover the remains. Consequently, the
method of informing the SDMEO, including the paper work, chain of information, and the content of the information is unique to each company and often unique to the person who makes the discovery. Also, in the cases where incomplete and skeletonized remains are located, most environmental and developmental surveyors do not have the capability of identifying the remains as human. Therefore, the potential for human remains not to be reported increases with the decomposition of a body. The lack of professionals with knowledge of human remains, and the lack of a detailed, comprehensive and cohesive legal documentation protocol leaves room for extreme variability among cases and a great potential for unreported and lost information pertaining to decedents located outside of populated areas.

RECREATIONAL ACTIVITY

The mountains and deserts of San Diego are very popular with people who like to ride off-road vehicles, hike, ride horses and engage in other recreational activities. Large parcels of land in the back country of San Diego are owned by either the Bureau of Land Management (BLM) or the National Parks Service (NPS), and are set aside for such activities. Since the land is owned by public agencies, most of this land is open to the public and scarcely monitored. Access to forests, mountains, and deserts is widely permitted and often have trail systems that rate from primitive dirt paths to well maintained public roads. This leads some of the more adventurous into very isolated areas that are otherwise rarely encountered. These more scarcely occupied areas are also commonly used by undocumented migrants while crossing the border. Consequently, civilians engaged in recreational activities are more likely to encounter migrants, both alive and deceased. Upon discovery of a decedent or skeletal remains, most civilians contact law enforcement directly by calling 911 or a non-emergency number. Others contact the Border Patrol, and some contact the SDMEO directly. No matter how the information reaches the SDMEO, they respond. Due to the unknown circumstance of the remains, law enforcement usually responds as well, and depending on the circumstance so does the Border Patrol. Together they gather all evidence available to determine the legal status of the case and to further aid in identification.
**Humanitarian Activists**

There are two well-known humanitarian groups that focus on individuals crossing from Mexico into the United States: Los Angeles del Desierto (Angels of the Desert) and Border Angels (Angeles de la Frontera). The intention of these organizations is to give aid in any way necessary to immigrants crossing from Mexico. Both groups are very active along the California/Mexico border regions. Angeles del Desierto was founded by current Director Rafael Hernandez. His organization of volunteers helps struggling migrants by providing water, food, and sometimes medical attention (Desert Angels, n.d.a). Los Angeles del Desierto also organizes search and rescue missions in the attempt to locate decedents and save lives. In the Mission Statement on their website, they claim to comb the desert and mountain regions of San Diego and Imperial Counties looking for distressed migrants, finding numerous individuals in an array of physical conditions including severe dehydration, exposure related ailments, injured, and deceased (Desert Angels, n.d.b) Upon discovery of the gravely unfortunate, Hernandez regularly contacts the John and Jane Doe coordinator or the SDMEO (G.Geary, personal communication, 2008). Hernandez also receives information from both sides of the border regarding missing or deceased migrants. He then organizes specialized search parties and informs the local law enforcement upon locating the decedent/s. The other humanitarian organization, Border Angels, is a very active group headed by cofounder Enrique Morones. It is actively involved in human rights issues on a local, national, and international level. The main focus in all areas is human rights and specifically the rights of migrant Latino populations. Saving lives of undocumented migrants, bringing justice to the wrong doings of individuals, corporations, and government agencies, and advocating fair and just treatment of all immigrants of legal and illegal status, is what Border Angels stands for (E. Morones, personal communication, 2008). Border Angels was started in San Diego in 1986 by Morones and strives to bring the migrant death toll down. Although Morones and his army of volunteers do not perform search and rescue efforts, they do go to the deserts and mountainous areas of San Diego and Imperial counties to leave supplies such as water and clothing for desperate travelers. They also help people with legal issues, housing, hunger, transportation, translation, and whatever else they can provide for the victims of circumstance. Bringing awareness to the public on both sides of the border about the number of deaths, the risks involved in crossing, and the overall dangers
and tragedies associated with illegal crossings is another focus of the group. On a local level, Border Angels keeps a posted record of all the known deceased that have fallen while trying to cross the US/Mexico border. Morones holds candlelight vigils in the cemeteries of the unknown and continues to try to find ways to honor the dead, bring exposure to the problem of the unidentified migrant, and find bi-national solutions to the problems that cause suffering and death. Although Border Angels do not enter into the deserts and mountains looking for people in need like Los Angeles del Desierto, they do respond to phone calls placed by migrants in trouble and to family members looking for their lost loved ones. They play an active and important roll in creating national and international awareness about the gravity of this issue.

Because of these groups’ international activism, many migrants are aware of these humanitarian groups prior to embarking on their journey. It is not uncommon that if an undocumented migrant gets into trouble, or someone in their party is not able to continue on, they will contact one of these groups who will then attend to them and/or call the proper authorities. Also, people who have had someone go missing while crossing the border may contact these groups for any assistance. The problem and frustration lies in the lack of a local or federal protocol for handling these cases. Personnel working with either of these groups can document information as it comes in, but there is no "next step." Attempting to locate someone who is a possible casualty requires connections, creativity and luck.

**Border Patrol Discoveries**

San Diego Border Patrol (SDBP) agents patrol the same terrain illegal migrant parties occupy while in transit. Consequently, unexpected discoveries of deceased undocumented migrants, sometimes occurs. Depending on the accessibility, agents will call the SDMEO or one of their tactical divisions, which are specially trained to conduct search and recovery parties under challenging conditions.

**Search and Recovery**

Search and recovery in the deserts and mountains of San Diego County is neither routine nor predictable. Once the SDMEO is alerted to a situation where a person or persons are in trouble or in need of professional assistance, it launches a search party. This generally takes place one of two ways. If the remains are in a known location and accessible, the
SDMEO will respond directly, but if the location is remote or inaccessible, the Border Patrol and other search and recovery agencies will assist as needed. When the SDMEO responds directly to the location of human remains, it is the responsibility of the John and Jane Doe coordinator to supervise and conduct the recovery of the individual or individuals. Once the remains are determined not to be of criminal interest, the remains are then taken into the custody of SDMEO and transported directly to the Medical Examiner (G. Geary, personal communication, 2008). Unfortunately, due to the nature of the situation, human remains are often located in locations far from roads and other means of easy access, and in some cases the precise location is unknown. In these circumstances, the SDMEO relies on the information provided by people on both sides of the border and the assistance of the SDBP, law enforcement agencies, and volunteers to participate in search and recovery efforts.

**San Diego Medical Examiner's Office (SDMEO)**

In the cases where the SDMEO is able to directly respond to a case of migrant death, its methods and procedures depend mainly on the condition of the body. The state of the body is dependent on the environment and can be in various stages of decomposition. The condition of the remains and the circumstantial evidence connected to the decedent play a crucial role in the ability to identify the individual. For these reasons special care is taken to recover all potential evidence that might be connected to the decedent. When a body is in relatively good condition or nearly complete, the potential for identification greatly increases. When remains are in a poor state, such as severe decomposition, skeletal, or scattered, the SDMEO may call upon a number of people to assist with search and recovery. Common local resources used are law enforcement, Border Patrol, and volunteer search and recovery groups, such as handlers with cadaver dogs, people trained in extreme search and rescue efforts, students, interns, and other community volunteers. In cases of skeletal remains, the SDMEO relies on the expertise of a Forensic Anthropologist for clues that may lead to an identification.

**San Diego Border Patrol: Special Operations Groups**

Upon notification of the existence of human remains present along the border, the SDBP may alert their appropriate Special Operations groups. These are specialized units within the Department of Homeland Security responsible for search and recovery along the
US/Mexico border. They are better equipped than any other agency to conduct a search and recovery effort in large and dangerous areas.

The United States Department of Homeland Security's Customs Border Patrol has a number of Special Operations Groups (SOG). They are individually specialized to meet the specific needs of emergency situations. SOG is headquartered in El Paso, Texas, yet they have a number of local units along the border region and respond to situations on global and domestic levels. The Special Operations Groups are split into two major operations units: BORTAC and BORSTAR.

The Border Patrol Tactical Unit (BORTAC) is a specialized group that is trained in law enforcement and military tactics. They have the capability to respond to disasters, threats, and combat situations. They were originally created in 1984 as a response to rioting at an Immigration and Naturalization Service detection facility. They quickly evolved to become a unit highly trained in high-risk warrant services, intelligence/reconnaissance and surveillance, foreign internal defense training, airmobile operations, maritime operations, and precision marksmanship and observations. These units are available to assist with foreign and domestic emergencies and are primarily used for militaristic operations (U.S. Customs and Border Protection, 2009b).

Of specific interest to this discussion is Border Patrol Search, Trauma, and Rescue (BORSTAR), a special operations unit comprised of specially trained Border Patrol officers that respond to search and rescue efforts in remote terrains. They have responded to major disasters and worked with Federal Emergency Management Agency, but their primary efforts are focused along the international border between the United States and Mexico. A few years after the initiation of this specialized unit, the changes in border security procedures changed, and BORSTAR became a critical branch of the Border Patrol responsible for locating and assisting people in grave need of rescue. Depending on the individual circumstances, BORSTAR will operate alone or in the company of other law enforcement agencies such as the Sheriffs Department or the SDMEO (U.S. Customs and Border Protection, 2009a).
Sheriff's Department

As mandated by the California penal code, the Sheriff's Department is responsible for the Search and Rescue division in each county. In 1963 the San Diego Sheriff's Department Search and Rescue (SAR) Bureau was created as part of the Emergency Services Division. Since the birth of this department they have been a vital resource in many search and recovery efforts throughout the county. Their jurisdiction includes San Diego County, excluding the City of San Diego, yet they will respond to San Diego City and beyond if requested (Sgt. D. Parker, personal communication, November 22, 2012; San Diego County Sheriff's Department, 2013). The SAR Bureau in San Diego is recognized on a national level and has ten distinct areas of expertise: Rescue (technical and non-technical), Canine, Communications, Logistics, Medical, Mounted, Motorized, Training, and Administration (San Diego County Sheriff's Department, 2013). All divisions work together within the department as well as with other outside agencies, including the California Border Patrol, the San Diego Medical Examiner's Office and other law enforcement agencies. Every case is unique, and SAR has the means to assist in a variety of cases in both urban and wilderness environments. When remains of an individual are located in inaccessible terrain, SAR will respond with units equipped and trained to conduct or aid in a search and recovery mission. Also, if scattered remains are found, or the exact whereabouts of the decedent is unknown, SAR will employ their canine units. In addition to search and recovery teams, canine units are very helpful in unfavorable conditions such as those found along the California/Mexico border regions. (Sgt. D. Parker, personal communication, November 22, 2012).

Canine (K-9) Units

K-9 units are extremely helpful when attempting to locate cadavers or people in need. These units include specially trained dogs known as cadaver dogs that participate in search and recovery efforts for deceased migrants. In addition to the K-9 units that are part of an existing legal agency, civilian dogs and their handlers from accredited agencies are utilized (Sgt. D. Parker, personal communication, November 22, 2012). In order to qualify as a cadaver dog, the dogs must obtain the appropriate qualifications. The standards for cadaver dogs and handlers are set by California's Mutual Aid Guidelines, which are established and enforced by the California Emergency Management Agency (California Emergency
Management Agency, 2011). These dogs are trained to locate human remains in various states of decomposition and in compromising situations. All cadaver dogs are trained in locating human remains by scent but many have specialties, such as being able to trail a particular individual, locate human remains in water, locate and identify a person's belongings, and locate skeletal remains.

**Volunteer Efforts**

In addition to legal agencies and K-9 rescue teams, San Diego County is home to a number of humanitarian wilderness volunteer groups, conditioned and dedicated to search and recovery efforts conducted in the unfavorable and dangerous eastern limits of the county. San Diego Mountain Rescue Team (SDMRT) is a California nonprofit corporation, established in 1967. SDMRT is an accredited member of the Mountain Rescue Association. This organization of volunteers is composed of outdoor enthusiasts, who primarily participate in search in rescue efforts conducted in remote terrain. They operate under the direction and control of the agency responsible for search and rescue at the site of operation.

Many of the groups mentioned above operate as organized volunteer teams. In addition to those assets, other individuals are sometimes invited to participate in search and rescue efforts. For example, professionals in the fields of Physical/Biological Anthropology or forensics sciences and students studying these disciplines are at times recruited to participate in surveys for skeletal remains and associated evidence. This allows the SDMEO to have other experienced volunteers aid in the recovery process.

**CROSS-BORDER RESOURCES**

In addition to US-based search and rescue efforts, Mexico has a system in place for informing US agencies of reports received by people in need and of the location of human remains located on the US side of the border. Centro de Comando, Control, Comunicación y Cómputo (C4) is a network of command centers, with locations in each Mexican State. In Baja California there are four locations, Tecate, Tijuana, Ensenada, and Mexicali. It is responsible for search and rescue on the Mexico side of the border, and for the communication within, and between governments in regard to search and rescue along both sides of the border (J. Olavarria, personal communication, 2013; Centro de Comando Comunicacion, y Computo, n.d.). Mexican government officials at the Mexican Consulate
and civilians take advantage of C-4. When notified of the existence of a person in trouble or of human remains along the US side of the border, officials at the Consulate will inform agents at C4. Depending on the contents of the report, C-4 will then alert the appropriate US agency to respond. This is part of an important international collaboration of agencies that have the ability to respond to people in need and to execute the recovery of a decedent.

**CONCLUSION**

Fortunately, San Diego has resources for search and recovery of human remains in the wilderness regions of the county, combining the efforts of law enforcement, SDMEO, and other qualified professionals and volunteers. From this junction, unless identification documents are located on the decedent, all remains are treated as John or Jane Does. The SDMEO treats all Doe cases uniformly and unbiasedly, relying on forensic scientists, anthropologists, and biological testing services to satisfy a legal and moral obligation to quickly identify every individual that passes through its jurisdiction.
CHAPTER 7
IDENTIFICATION-METHODS

Burial, repatriation, and closure are all dependent upon the positive identification (ID) of a decedent. Methods of obtaining a personal identification are multiple and hierarchical: presumptive, tentative, and positive (Boyd & Boyd, 2011). These levels of identification are determined by the condition of the remains, bones available, and the physical evidence recovered with the body. Methods of positive identification can provide an ID with a single piece of evidence, but are limited to biological evidence that is unique to the individual, such as a visual identification, dental records, fingerprints, and DNA. Tentative identification is a stage in the investigation where the accumulation of presumptive evidence narrows the scope of possible IDs to a probable identification. Presumptive identification uses multiple methods of identification collectively. Presumptive methods yield evidence that cannot stand alone, yet together they can work to build a positive identification. There are many sources of information that qualify as presumptive evidence, including personal effects, documentation, physical descriptions, skeletal analysis, facial reconstruction, etc. In order to maximize the chances of identification, a collaborative effort between legal and scientific communities is made, using all available resources and methods of identification to resolve the issue. Forensic Anthropology (FA), biological sciences, and technology all play important, interdependent roles in producing both types of evidence in the effort to achieve a positive ID.

POSITIVE IDENTIFICATION

In the case of John or Jane Doe it is the responsibility of the San Diego Medical Examiner’s Office (SDMEO) to make the effort for identification. The condition of the body and/or the skeletal elements recovered greatly determines the methods utilized for identification purposes. The body can be in any condition, from completely fleshed, with minimal decomposition, to entirely skeletonized. Bones are also found in a variety conditions, as a complete skeleton, partial skeleton, in fragments, recently skeletonized,
weathered, burned, and so forth. When bodies are recovered with minimal decomposition, the age, sex, stature, and ancestry may be easily determined through a combination of physical and visual examinations. In cases of severely decomposed remains, the SDMEO relies on forensic anthropology to create a biological profile of the deceased that may contribute to the identification of the victim. Although not always feasible, nor attainable, positive methods of identification are preferred for unidentified human remains (UHR). When applied systematically, following specific protocol, other reliable methods of identification, using presumptive evidence, can be used to accomplish a positive ID.

**Visual Identifications**

Visual identifications are limited to remains that have not succumbed to the decomposition process. Decomposition is a highly variable process that is greatly dependant on environmental conditions, including temperature, humidity, faunal constituency, and insect activity (Parks, 2011). In studies conducted in the Southwest, decomposition generally begins within two days after death. Bloating and disfigurement begins during the stages of early decomposition by day two, advances within four to ten days, mummification can occur between ten days to one month, and skeltonization occurs two to nine months after death (Galloway, 1997; Parks, 2011; Sledzik, 1998). If the remains are recovered before decomposition disfigures and renders them unrecognizable, and the next of kin is available, a visual positive identification will be made. However, in the case of migrants, that is not usually the case, and other methods are then utilized. A presumptive identification is begun by comparing the observed physical traits of the individual, with documented missing persons information. Additionally, personal anomalies, such as tattoos, dental-work, scars, antemortem trauma, and personal possessions found with the decedent can aid investigators in the identification process.

**Dental Analysis-Forensic Anthropology/Odontology**

Teeth are a recognizable part of a person's identity. In life, a smile is as unique to an individual's persona as are the genetic markers that combine to create the individual. In death, "forensic dental identification plays an important role in establishing the identity of unknown decedents because of the individuality of dental patterns, [and]the resilience of dental structures to withstand extreme conditions" (Van der Meer, Brumit, Schrader, Dove,
The adult human dental arcade consists of thirty-two individual teeth. The upper and lower dental arcade is divided into four sections, left and right maxilla and left and right mandible. Each of these sections includes four categories of teeth: two incisors, one canine, two premolars, and three molars, or what is referred to as a 2-1-2-3 dental pattern. Although most humans exhibit this pattern, the morphology of each individual tooth is unique, and the profile of the dentition within the mouth is personal to the individual. Also, many adults have endured some form of dental modification during their lifetime, which both individualizes their dentition further, and most likely has corresponding dental records. The most common forms of alterations seen today are dental restorations and extractions but can include esthetic modifications as well. Forensic anthropologists and odontologists are able to positively identify individuals by comparing antimortem (AM) dental records with postmortem (PM) radiographs, and dental remains. Forensic odontology is a branch of dentistry that works within the criminal justice system to aid in the identification of decedents through the proper examination of dental evidence (Kavitha, Einstein, Sivapathasundharam, & Saraswathi, 2009). Forensic anthropology and odontology overlap when identifying skeletal or severely decomposed remains. Point by point analysis of dental evidence considers the morphology and metric analysis of the teeth in question (crown, root, and developmental stage), and the surrounding alveolar bone. The crown of the tooth holds signature information through the systematic evaluation of the morphology (size and shape), attrition patterns, and modifications. The more points to compare, the more reliable the identification, but each characteristic can be telling on its own. For example, genetic traits such as shoveling of the anterior teeth are known to be more frequently expressed in certain ancestral populations, more than others (Anderson, 2008). In addition to the crown, root analysis has proved to be a reliable method of identification. The size, shape, and placement of the tooth in the orofacial bones, and the root tip morphology exhibit a unique profile (Johansen & Bowers, 2012; Saxena, Sharma, & Gupta, 2010; Schmitt, Saliba-Serre, Tremblay, & Martrille, 2010). According to recent studies, the morphology and alignment of the root is more helpful to odontologists and anthropologists than the crown (Van der Meer et al., 2010). Still, in the rare case where dental casts are the only means of comparing AM and PM dental records, evaluating the cusp patterns and the geometric relationships between cusps within a single tooth, can lead to an identification (Johanson & Bowers, 2012).
Analysis of the dentition is a highly reliable, cost effective, timely, and fairly simple method of identification (De Luca, Bautista, Alemán, & Cameriere, 2011; Saxena et al., 2010). However, it is limited to cases that have existing tentative identifications, and the corresponding AM dental records available for comparison. Unfortunately, in the case of undocumented migrants, dental records seldom exist, and when they exist they are difficult to obtain.

**Fingerprint Analysis**

Contemporary forensic methods of fingerprint analysis use digital recognition programs that target raised dermal patterns located on individual fingertips. The more points the program matches with the prints in question, the higher the probability of a positive match. Unidentified undocumented migrants are not usually identified by means of fingerprints due to their illegal status and degree of decomposition. The SDMEO does not have access to foreign countries’ fingerprint databases, and therefore rarely have any prints to compare. Moreover, many of the remains suspected to be of undocumented migrants are recovered in a state of full or partial skeletonization, making fingerprints difficult or impossible to retrieve (Girish, Rahman, & Tippu, 2010; Komar & Potter, 2007). However, in some cases, it is possible to retrieve prints by rehydrating mummified finger tips. In cases where fingerprints are available, they are documented and added to the case file. In cases where AM prints are provided, they are compared for identification. If there are no prints to compare, the fingerprints are then submitted to state and national forensic database systems. There are a number of US databases that accumulate fingerprint information of missing or unidentified persons, and people with criminal records. However, most of those resources are focused on identifying US citizens and are only helpful in identifying foreign nationals if they have a US criminal record, or their prints have been submitted in a US missing persons report. There are a couple databases focused on immigration records (IDENT and U-VISIT) that may be useful in identifying foreign nationals (see Appendix A).

**Genetic Analysis**

Deoxyribonucleic acid (DNA) is the unique genetic makeup of an individual. As technology has advanced, DNA has become an increasingly important tool in human identification (Boles, Snow, & Stover, 1995; Misner, Halvorson, Dreier, Ubelaker, & Foran,
DNA has earned recognition as the "smoking gun" in criminal cases, and as an invaluable piece of evidence in cases of unidentified human remains (UHR). Since 1994 the Federal Bureau of Investigation (FBI) has been exploring the advantages of DNA evidence in the form of multiple, accessible, and cross-referencing DNA databases (See Appendix A). These systems allow permissible parties to enter DNA data from criminal cases, criminal perpetrators, missing persons, family members, and most important to this study unidentified human remains. Databases that accumulate and cross-reference multiple forms of evidence allow for positive and presumptive methods of identification to be used in a collective manner. This increases the possibilities of achieving a positive ID and subsequent repatriation.

Methods of retrieving DNA data are many, and are dependent on what is available for testing. If blood is available, a pathologist will draw a sample during autopsy. If blood is unavailable, but soft tissue still exists, a buccal (inside of the cheek) swab is taken, or if osteological remains are the only material recovered, bone samples are submitted. Samples are then sent to California's Identification Center (CAL-ID), or stored until they are able to be submitted (J. Estrada, personal communication, 2013). CAL-ID is linked in the FBI's Combined DNA Index System (CODIS) and the National Missing and Unidentified Persons System (NamUs), which is a program created by the National Center for Forensic Science for the purpose of integrating the use of technology with the practice of forensic science to assist in the identification of UHR. This national system links multiple databases together, allowing for the cross-referencing of evidence and is accessible by Medical Examiners and Coroners. NamUs establishes guidelines for the collection and submission of personal effects gathered during the recovery process, and biological evidence collected during the autopsy or anthropological analysis. Federal mandates require the submission of appropriate professional reports and DNA samples, as described in NamUs/CODIS (The DNA Identification Act of 1994, 2010). There is a hierarchical list of preferred bones submitted for testing, and analysis, based on tested methods of successful extraction of viable DNA samples (see Appendix A).

Literature has identified multiple methods of obtaining DNA samples from human skeletal remains. Although incomplete skeletal remains sometimes prove to be a much more difficult source of usable DNA, certain sections of the skeleton are more reliable than others
(Misner et al., 2009; Nelson & Melton, 2007). For example, teeth-complete, un-restored molars are often preferred. This is due to the protective enamel layer surrounding the inner pulp cavity. The femur is the optimal sample of the post-cranial bones (Misner et al., 2009). Due to the morphology and robustness of the upper leg bone, the likelihood of DNA preservation is greater. As in all methods of UHR analysis, the sample choice is subject to the bones available for testing and the condition of the remains. DNA testing does have limits. It is a complicated, destructive, and a time-consuming process, taking up to two years for results to be issued (J. Estrada, personal communication, 2013). Also, being a biological structure, DNA molecules naturally degenerate (Götherström, Collins, Angerbjörn, & Lidén, 2002). Time, decomposition, environment, and contamination are all factors that commonly render DNA samples unusable. Deceased migrants are often susceptible to these variables and are likely to be partially or fully skeletonized. Therefore, it is important that forensic anthropology is an active presence in the investigation. Although there is a preferred list, such as the one provided by NamUs, understanding osteological composition allows for anthropologists to methodically select specific bones that will yield the best results, maximizing the possibility of a positive identification.

**Presumptive Identification**

Presumptive identifications rely on multiple types of physical evidence, which are clues to the identity of the individual. Methods from various forensic disciplines are utilized in a cumulative effort to assist in the identification process of UHR. Depending on the condition of the remains, specific methods of identification will prove to be more useful than others. It is a process of building a personal profile through the accumulation of biological and material evidence. In many cases, evidence collected at the scene or on the victim may suggest an identity, but the scientific methodology of forensic anthropology is necessary to create a biological profile that may prove essential to successful identification.

**Documentation**

Migrants sometimes carry documents that may be useful to investigators as a form of tentative identification. In cases where decedents do possess identification, a Mexican issued voter’s card is a common document recovered. This particular document includes an individual's personal information and a right thumbprint. The physical information, picture,
and fingerprint provided by the voter's card is compared to the physical information retrieved during the autopsy (Birkby et al., 2008). If there is no discrepancy between the documents and the physical identification, the Mexican Consulate is then notified and jurisdiction is transferred to the Mexican Government (J. Estrada, personal communication, 2013). Documents can be helpful, but in cases where they are not consistent with one’s physical appearance, or the fingerprints do not match, other means of identification cancel out the information provided by those documents, and investigators move on to alternative forms of ID.

**Third Party Identification**

Another example of presumptive identification, which is not uncommon with migrant parties, is when officials are alerted to the location of a decedent by someone who knows the identity of the victim. This may happen if a person traveling in a party of migrants dies, and someone in the party alerts authorities. The tentative identification given by a third party is taken into consideration as a possible ID, but then has to be confirmed by more traditional methods.

**Facial Reconstruction**

Another method of analysis that uses forensic anthropology is facial reconstruction. This “is a technique based on both scientific standards and artistic skill to rebuild a face onto a skull to recreate the antemortem appearance of the individual” (Won-Joon, Wilkinson, & Hwang, 2012). Currently there are two basic methods of forensic facial reconstruction that are utilized: two-dimensional (2D) and three-dimensional (3D), which can be further subdivided into manual and computer generated images (Won-Joon et al., 2012). In all cases, reconstructions are created by understanding the common principle of the relationship between facial skeletal structures and the overlying soft tissues. This helps the artist predict the physical appearance of a facial morphology. Forensic anthropologists provide the artist with cranial measurements necessary to produce an image of the decedent. In addition to the cranial information, forensic anthropologists may be able to contribute skeletal data that can help the artist personalize the image by factoring in ancestry, sex, stature, age, and personal history, which can be observed as evident skeletal pathology. The artist applies layers of muscle and other soft tissues in a methodical manner, which has been determined by tested
statistical averages that correlate with the individual's assumed age, sex, and ancestry (Manhein et al., 2000). During autopsy, anthropologists may be able to provide additional descriptive characteristics based on evidence left on the body, such as hair color, tattoos, clothing remnants, or other personal information. Depending on the methodology used to produce the image, it will result in a computer generated three-dimensional, or two-dimensional image, or traditional, manual, methods produce 2D sketches, or 3D busts, which are generally made of clay, and often complimented by glass eyes, wigs, and other accessories. This method is one that is familiar to law enforcement and often utilized, especially when all other avenues have been exhausted (A. Mayes, personal communication, 2013; Wagner, 2011). Nationally, law enforcement agencies have successfully used this method to develop leads that can result in the identification of previously unidentified human remains. However this method is limited to cases where the skull has been recovered, or where enough of the cranium is recovered for reliable reconstruction methods to be employed. Also, due to population variation, and the lack of data for many populations of mixed ancestry, this method has been doubted by many anthropologists for accuracy (Won-Joon et al., 2012).

**Skull-Photo Superimposition**

Another method of identification is cranio-facial superimposition. This method uses images of the skull in question and the person suspected to be the decedent. Images of the frontal and lateral profiles of the skull are taken to compare metric and morphological data. Depending on the facility, a computed tomography (CT), or digital photographic image of the skull, is arranged to mimic the angle and size of the face in the photo provided (Ishii et al., 2011). These images are digitally layered for comparison. Traditional anthropomorphic measurements (width and breadth of the eye orbits, the height of the nose and forehead, etc.), and morphological traits are used collectively in a biological analogy to make a positive identification (Birkby et al., 2008; Ishii et al., 2011). This methodology is not discriminate of sex or ancestry and has been successfully applied to multiple populations (Birkby et al., 2008; Ishii et al., 2011). It has the potential to be a timely, reliable, and cost effective way to provide a positive ID. However, it is limited, and dependent on the condition of the remains,
technical resources, a probable identification for comparison, and the availability of useful photographs.

**Forensic Anthropology-Creating a Biological Profile**

Anthropologists use a series of standardized and tested methods, which analyze morphological characteristics and anthropomorphic measurements to determine age, sex, and ancestry. Moreover, they are able to describe antemortem pathology, which is unique to the individual, such as healed or healing fractures, disease processes, and other conditions that may be present in medical records. Using these descriptive techniques, anthropologists are able to generate a biological profile of a decedent, and when available, compare antemortem data with postmortem findings to aid in identification of an individual, and/or the cause of death. Forensic anthropology applies the knowledge of skeletal biology to a medico-legal context, intersecting anthropological and forensic methodology. By understanding the process of decomposition, and the fundamental processes of bone growth, development, degeneration, and reaction to trauma and disease, specialists are able to systematically analyze skeletal remains, maximizing recovered evidence. Clues left on a victim’s body that may have been elusive to other law enforcement agents or medical pathologists are often observed by forensic anthropologists, aiding in identification and providing other crucial evidence. These classic methods of analysis have been amplified and enhanced through technological advances. Today many advances have come to the forefront of forensic science, helping anthropologists identify unidentified human skeletal remains. What determines which methods to utilize is often how much of the skeletal elements remain.

**Skeletal Analysis**

Skeletal analysis utilizes morphological, metric, and bio-chemical information to create an accurate biological profile of the decedent and attribute geographic origin. Analysis of skeletal morphology, evaluates the shape, formation, and structure of the bone. Metric analysis evaluates the dimensions of the skeletal components, measuring between standardized landmarks. Both morphological and metric data are used to describe individuals and compare groups (Buikstra & Ubelaker, 1994). Bio-chemical factors include isotopic analysis, DNA, and other molecular variables that are looked at as part of a personal profile, generating information that might indicate who someone is and/or where they are
from. Creating such a profile to aid in the identification process includes evaluation of skeletal remains to determine sex, age, stature, ancestry, pathology, and, when possible, geographic origin. It is standard for anthropologists to apply all available methods to the skeletal material recovered, for the determination of the aforementioned categories. This approach ensures the most comprehensive analysis possible, and increases the accuracy of the profile and the potential for a positive identification.

Buikstra and Ubelaker (1994) collaborated with multiple anthropologists to create a cumulative manuscript, “a descriptive data base” of methods for analyzing human skeletal remains, implementing a standard for recording skeletal data. Descriptions, illustrations, and photographs of landmarks on the skeleton that are frequently used for assessing age, sex, ancestry, stature, and pathology are presented to guide anthropologists through the process of creating a biological profile (Buikstra & Ubelaker, 1994). These five components are discussed below as a baseline for creating a biological profile, and complemented by alternative sources of biological information such as strontium analysis, histology, and DNA. In addition to the recommendations of Buikstra and Ubelaker (1994), there have been many alternative methods developed based on skeletal analysis. Yet, due to the focus of this paper, methodology that has been modified to apply to populations who are likely candidates for becoming undocumented, deceased migrants, are given more attention than other procedures that are applied to U.S. populations. Moreover, deficiencies in standard methodology for accurate analysis of Hispanic populations will also be discussed.

SEX

Sex assessment is one of the more basic pieces of evidence produced through skeletal analysis. It greatly narrows the field of search for identification and is performed as a principle step in the ID process, determining the assignment of John Doe or Jane Doe status (Anderson, 2008). Humans are sexually dimorphic beings, displaying physical characteristics that are generally grouped as male or female. Naturally, this generates testable differences in size and shape of the male and female anatomy, allowing for multiple methods of sexing to be developed and utilized by forensic anthropologists. Through a descriptive process of analysis, individual traits are scored, and then weighed in accordance to significance, as some traits are more indicative of sex than others. Individuals are then
grouped as definite or probable male/female, and in some cases individuals may be classified as indeterminate.

Nearly every region in the human skeleton, cranial and post-cranial, has the potential for revealing the sex of the individual or aiding in the process. The pelvic girdle is the most reliable source of sexing information, followed by cranial features. However, when neither are available, or more evidence is needed to assure the results, or corroborate less conclusive observations, other skeletal elements will be used. Metric and morphological methodologies have been tested and accepted as reliable ways to sex unidentified human remains (UHR). It is standard to evaluate the morphological structures of the skull, and by adding metric evidence as a complementary and integrated variable allows for a more accurate and comprehensive assessment. Craniometrics measure between designated points on the skull, and then, for sexing purposes, refers to a standardized chart created by using discriminate functions that were based on studied ranges of human variation (Giles & Elliot, 1963). Using the post-crania, Trotter and Gleser (1952) established a metric range of variation for male and female long bones.

Analysis of the morphology to determine sex is based on scoring techniques that describe the robusticity of the bones, the prominence and level of expression of sexually dimorphic traits, such as the mental eminence (chin), supra-orbital ridge (brow ridge), or the mastoid process, and the rugosity of the muscle attachments of the skull and the post-crania. Because there is a predictable pattern of males being larger, and more robust, while females are generally smaller and more gracile, metric and morphological sexing methods often overlap. Morphometrics combine these morphological and metric observations. It is a multivariate approach that can be applied to cranial and post-cranial bones. For example, using the skull, morphometrics analyzes of the geometric relationships between craniofacial features, such as the dimensions of the eye orbits in relation to the positioning on the face (Kimmerle, Ross, & Slice, 2008). Also, this method can be applied to other areas of the body, including long bones, and the os coxae (Kimmerle, Konigsberg, Jantz, & Baraybar, 2008; Spradley & Jantz, 2011; Tise, Spradley, & Anderson, 2013).

There are multiple characteristics of the pelvic bones that can be scored to determine sex. For example, the shape of the male pelvic girdle is generally longer and narrower than the female, which has a lower, wider bowl-shape appearance. Positive expressions of three
specific structures of the subpubic region indicate female, and are scored as “present or absent”: ventral arch, subpubic concavity, and the ischiopubic ramus ridge, (Buikstra & Ubelaker, 1994). Moreover, the greater sciatic notch tends to be broader in female anatomy, and the preauricular sulcus, which is a groove on the ilium, near the inferior border of the auricular surface is often exaggerated in females. As a result of pressure, or tearing, on the sacroiliac joint, it can be observed in males and females. However, it is most dramatic in females due to the child-bearing process (Buikstra & Ubelaker, 1994). Additionally, the ischiopubic index is a way of quantifying the morphology of the pubic bones, by measuring the length of the pubis and ischium bones. When innominate bones are unavailable, other skeletal elements are used. Femur and humerus dimensions are often preferred. For example, the diameter of the femoral head, humeral head, and the biepicondylar diameter of the humerus have all shown to be effective indicators of sex, and because of the more gracile appearance of Hispanic skeletal remains, post-cranial methods of sex estimation have been found more reliable than those used to evaluate the skull (Spradley et al., 2008). Other metric analysis for sexing purposes include measurements of the scapulae, long bones, clavicles, hands and feet, mandibular ramus, and craniofacial regions (Case & Ross, 2007; Dabbs & Moore-Jansen, 2010; Harris & Case, 2012; Kimmerle, Ross, et al., 2008; Krishan, Kanchan, Passi, & DiMaggio, 2012; Langley-Shirley & Jantz, 2010; Saini et al., 2011; Spradley et al., 2008; Tise et al., 2013).

As touched on above, one ongoing problem with achieving an accurate sex determination is the lack of diversity represented in the skeletal samples (Spradley et al., 2008; Tise et al., 2013). Skeletal data from historical U.S. populations is the source of information which suggests how morphological and metric analysis should be executed and interpreted. Classic sexing methodology has been developed with the analysis of African and European American skeletons. The data lacks the ability to represent diverse populations. Specifically, studies have shown that Hispanic populations are not accurately represented when analyzed using the standard methods (Birkby et al., 2008; Spradley et al., 2008; Tise et al., 2013). For example, Hispanics tend to have a more gracile skull and post-cranial bone structure, often grouping Hispanic males within the classic female range that has been generated by American anthropologists, based on U.S. populations. This poses a problem when attempting to identify possible migrants because most that cross are male, and an
incorrect identification of sex leads to the omission of an individual from the proper list of possible IDs. Currently, there are many studies addressing this problem, strengthening the accuracy of anthropological techniques by developing and using population-specific methodologies (Anderson, 2008; Kimmerle, Ross, et al., 2008; Spradley et al., 2008; Tise et al., 2013).

**AGE**

Indication of age-at-death is an important piece of evidence when building a biological profile. There are numerous methods of achieving an age approximation, and because sexual dimorphic anatomy exhibits specific morphological characteristics, knowing the sex of the individual can help refine the employed techniques (Garvin & Passalacqua, 2012). These methodologies describe and evaluate timed degenerative changes that are exhibited uniquely on specific areas of the skeleton. During growth and development, maturation can be observed by evaluating the degree of unification between the epiphyses and metaphysis of most post-cranial bones. Also, the fusion of primary ossification centers, such as the ilium, ischium, and pubis of the os coxae, and the squamos, lateral, and basilar parts of the occipital bone, as well as tooth development, and eruption are used to estimate age-at-death. When evaluating mature skeletal remains, one uses methods that have been developed to evaluate the degenerative boney processes, which mainly occur at articulation points on the post-crania. Again, the pelvis is the most reliable source of age information, but when available, employing multiple methods ensures the most accurate conclusion possible (Buikstra & Ubelaker, 1994; Kimmerle, Konigsberg, et al., 2008; Konigsberg, Herrmann, Wescott, & Kimmerle, 2008). There is a general hierarchy of preferred aging methodologies, depending on the condition of the remains, technology available, and if the decedent is an adult, or sub-adult. Since the majority of unauthorized migrant populations that are likely to become unidentified decedents are adults, the focus of this paper is on methods pertaining to mature skeletons, with the exception of specific developmental processes that conclude during chronological adulthood.

Birkby et al. (2008) noted that the majority of border-crossing victims are males in the age range of 20-30. Although we consider people in this age range as adults, biologically there are still skeletal indicators that categorize them as immature. Epiphyseal fusion and
Dental eruption are two prime examples of this. By the time a person reaches the age of 20, most of their bones are going to be completely fused but some will still likely show signs of the union process. Most bones go through a process of endochondral ossification, in which bones are preceded by cartilaginous models that then ossify in an orderly manner. To allow for growth, the ends of the metaphyses and the epiphyses are separated by a layer of cartilage. This cartilage plate is continuously replaced by osseus material on the diaphyseal side of the plate as the bone matures and increases in length, eventually becoming fully ossified and fusing with the epiphyses. Starting at the center of the metaphysis/epiphysis union, fusion is a process that occurs at a predictable rate, during the maturation process, which has been documented and implemented as a method of aging by anthropologists (Buikstra & Ubelaker, 1994; White & Folkens, 2005). Epiphyseal unions are scored according to the degree of fusion observed. Ossifying from the center out, the line between the metaphysis and the epiphysis starts with a large visible gap. As the bone matures the epiphyseal line diminishes, culminating with the complete ossification and obliteration of any indication of the fusion process. This process of skeletal maturation is present in nearly every bone, with ossification time-tables unique to each bone (Buikstra & Ubelaker, 1994). Migrant fatalities are generally within an age range where most of their bones are fused, but the medial end of the clavicle, the sacrum, the iliac crest, and the calcaneus may not fully fuse until the individual is in his or her twenties or thirties (Buikstra & Ubelaker, 1994).

In addition to epiphyseal fusion, dental development can be useful when aging individuals in their early twenties. Usually, dentition is used to age sub-adult remains. Due to the timely nature of dental development, anthropologists and odontologists can look at the developmental stages of the crown and root systems of deciduous and permanent dentition to estimate a reliable age-at-death for sub-adults. Most of an individual’s permanent dentition is fully developed by the age of fifteen; however, the third molars may not be completely erupted until one reaches the late twenties or early thirties (Ubelaker, 1989). However, most modern humans have to undergo surgery to remove the third molars prior to eruption, and some people are born with some or none of their third molars. With that said, looking at dental development may not be a helpful tool in aging all cases of deceased migrants. However, there are new methods of analyzing dentition for age-at-death. Cameriere et al. (2006) and De Luca et al. (2011) have explored the method of estimating age-at-death.
through pulp/tooth area ratio in canines. This method looks at radiographs to measure the apposition of secondary dentine in canines (De Luca et al., 2011). Dentin is a living tissue in the morphology of teeth; it is the material under the enamel and surrounding the pulp cavity. As a natural process, dentin continuously deposits secondary deposits at a measurable rate that gradually eliminates the pulp chamber (De Luca et al., 2011). By applying the three equations suggested by Cameriere et al. (2006), a reliable age-at-death can be produced (De Luca et al., 2011). Moreover, De Luca et al. (2011) tested canines from historical Mexican individuals, while Cameriere et al. (2006) tested canines of medieval Europeans with reliable accuracy, suggesting that this method may be an efficient, non-invasive method of estimating age-at-death for a wide range of skeletal remains.

Garvin and Passalacqua (2012) conducted an experimental survey to study the methods of aging preferred by current forensic anthropologists. Results indicate that evaluation of the pubic symphysis is unanimously the favored method of aging adult skeletal remains, followed by the sternal end of the fourth rib, and the auricular surface (Garvin & Passalacqua, 2012; González-Colmenares, Botella-López, Moreno-Rueda, & Fernández-Cardenete, 2007). The pubic symphysis is the medial articulating surface of the left and right pubic bones. It has been a tested skeletal aging technique for decades, becoming an American standardized method in 1920 by T.W. Todd, and further improved by Suchey-Brooks in 1986 (Kimmerle, Konigsberg, et al., 2008). The Suchey-Brooks method provides descriptions, and illustrations that represent the boney, degenerative, changes of the symphyseal face. The Todd system describes these changes in ten phases, while the Suchey-Brooks scoring system first divides the data into male and female, and then gives six phases, with two sub-phases within each of those six descriptive phases. Both systems evaluate seven key features: ridge-and-furrow system, dorsal margin, dorsal platform, ventral rampart, ossific nodules, rim, and delimited extremities (Buikstra & Ubelaker, 1994). Descriptions are categorized into biological phases, with corresponding chronological age ranges.

The auricular surface located on the ilium is the face of the sacro-iliac joint. It is another area that exhibits systematic age-related changes, which are more complex and difficult to score (Buikstra & Ubelaker, 1994). Like the pubic symphysis, the auricular surface is a scoring process, describing the degenerative condition of the articulating surface by looking at four specific landmarks within the surface: apex, superior demiface, inferior
demiface, and the retroauricular area, and four morphological conditions of the surface: billowing, granularity, density, and porosity. Although this system is more challenging, it is noteworthy because this area of the innominate is durable and recognized to be a useful method of documenting age-related changes when the pubic symphysis is not available (Buikstra & Ubelaker, 1994; Lovejoy, Meindl, Pryzbeck, & Mensforth, 1985, Mayes, personal communication, 2013).

İşcan, Loth, and Wright (1984) employed a method using the sternal end of the fourth rib to age an individual; this method is also a common practice for forensic anthropologists (Dedouit et al., 2008; Garvin & Passalacqua, 2012; İşcan, Loth, & Wright, 1984, 1985; Kimmerle, Konigsberg, et al., 2008; Passalacqua, 2009). This method evaluates the boney changes of the costal face (the ventral articulating surface), and the rim of the rib end, looking for patterns of degeneration that coincide with Iscan's age ranges. Contour and density of the costal face are evaluated as well as the sharpness and contour of the rim of the rib end. Although Garvin and Passalacqua’s (2012) research has indicated that anthropologists are comfortable using this method, recent evaluations of this method have been published, stating that it generates inconsistent results and is unable to accurately consider global populations, and that additional methods of aging should be employed with it (Fanton, Gustin, Paultre, Schrag, & Malicier, 2010; Hartnett, 2010). The acetabulum is another region located on the os coxa, and is the articulating joint with the femoral head. Like the above methods, Rissech, Estabroom, Cunha, and Malgosa (2006) described degenerative phases of the acetabulum that can be observed, described, and attributed to an age range.

Evaluation of cranial suture closure is another standard methodology used to estimate age-at-death of mature remains. This method is an evaluation of the level of closure (fusion) of the cranial bones, which corresponds to an estimated chronological age-at-death. There are seventeen locations within the cranial sutures that can be evaluated: ten ectocranial, four of the hard palate, and three endocranial. Cranial sutures are known to fuse in patterns, endocranial fusing before ectocranial, and the vault fusing at an earlier age than the lateral sutures (Buikstra & Ubelaker, 1994; Lovejoy et al., 1985). Also, sutures fuse in predictable patterns, allowing for a more refined analysis by experienced anthropologists, with the lateral-anterior region proven to be a better predictor of chronological age. The degree of
closure is scored individually, and then can be added together for an accumulative composite score. If the full cranium is not recovered, sutures can be evaluated individually. The ectocranial sutures are divided into two sub-categories: five sutures on the vault, and five on the lateral-anterior surface of the skull. The sutures are evaluated on a scoring system of “0-3” with 0 representing open sutures, and 3 indicating that the sutures are fully closed and obliterated (Buikstra & Ubelaker, 1994). Although it is standard practice, there is considerable variability in suture closure rate, which reduces the value of this method, and therefore should be a corroborative piece of evidence rather than an independent source of information (Buikstra & Ubelaker, 1994; J. Buikstra, personal communication, 2007).

Other anthropologists have developed methods of aging adult skeletal remains using other portions of the body, such as the first rib, vertebrae, and the sacrum (Albert, Mulhern, Torpey, & Boone, 2010; DiGangi, Bethard, Kimmerle, & Konigsberg, 2009; Kunos, Simpson, Russell, & Hershkovitz, 1999; Passalacqua, 2009).

**Stature**

Stature is another fundamental variable factored into the biological profile, aiding in identification. The estimation of stature is attempted by either using the anatomical method of measuring the height of the skull, vertebrae, femur, tibia, calcaneus, and talus, or the method of applying individual bone dimensions to a regression formula. The latter method is more common because skeletal remains are not always complete. Yet, when available, the anatomical method is preferred because it simply measures the individual, eliminating errors the regression formula may produce (Maijanen, 2009).

Metric analysis of the lower long bones (femur, tibia, and fibula) is the standard methodology for producing an estimation of stature. Individual measurements are taken from specific bones, based on a descriptive protocol. The leg bones are more positively correlated to stature than the long bones of upper body (Kieffer, 2010; Meadows & Jantz, 1992). However, regression formulae are unique to each bone and can be applied to each individual long bone, yet the confidence level of the analysis decreases with the lack of skeletal material. In the 1950s Trotter and Gleser (1952, 1958) established regression formulae using the length of long bones to estimate the actual height of an individual. Although there are a number of other methods available, the Trotter and Gleser methods are
still utilized today by forensic anthropologists (Giroux & Wescott, 2008; Wilson, Herrmann, & Jantz, 2010). A more current application of information is the use of FORDISC. It is a computer software application that is available, and commonly used by forensic anthropologists to run regression analyses and other metric formulae for identification purposes (Wilson et al., 2010). The program allows for multiple discriminate variables to be considered and analyzed using the Forensic Database. Indiscriminate of what methods are used to establish stature, there are standard adjustments that are applied to the results. A decedent’s age-at-death may require an adjustment for natural decrease in stature, bones may shrink due to drying and exposure, and discrepancies between measured height and reported height are considered when attributing stature. Moreover, much of the current literature calls for the reevaluation of metric methodology used for stature, because population variation is not sufficiently represented in the formulaic analysis (Giroux & Wescott, 2008; Kieffer, 2010; Meadows & Jantz, 1992; Spradley et al., 2008; Wilson et al., 2010).

**ANCESTRY-Population Variation**

Ancestry is a crucial, yet difficult, piece of the biological profile to produce. It is the evidence that governs how other methods of analysis are construed. Ancestry can be achieved through analysis of metric techniques and morphological characteristics, with the majority of the observations evaluating features of the skull, mandible, and teeth (Birkby et al., 2008; Hefner, 2009; Spradley et al., 2008). Morphological characteristics are interpreted by qualifying a bone’s shape (e.g., the eye orbits have a square or round shape), a suture’s direction (e.g., the zygomaticomaxillary suture is S-shaped), feature’s presence or absence (e.g., shoveling of the anterior dentition is present), and a feature’s level of expression (e.g., the nasal spine is pronounced). Studies by anthropologists have developed methods to evaluate these traits and categorize individuals as belonging to ancestral populations, based on the frequency and level of expression of specified phenotypic traits (Hefner, 2009). E. A. Hooton (1887-1954), in the first half of the twentieth century, established the methodology of attribution of ancestry by recognizing patterns of expressions and creating standards that are still used by modern forensic anthropologists (as cited in Hefner, 2009; Hooton, 1946). Ousley and Hefner (2005) coined the term *morphoscopic* traits to describe the nonmetric
traits recognized by Hooton that can be evaluated according to presence or absence and the
degree of development and form (Hefner, 2009).

Traditionally, forensic anthropologists have identified individuals as belonging to one
of three ancestral populations: White (of European descent), Black (of African descent), and
Asian/Native American. Until recently, in much of the literature, Native Americans were
biologically grouped with Asian populations. Some of the morphoscopic traits that are used
to evaluate individuals for ancestry are as stated: African ancestry typically displays
rectangular eye orbits, prognathic facial profile, hyperbolic palate, wide nasal aperture,
guttering at the nasal sill, and blunt chin. Traits that are generally attributed to Asian/Native
American ancestry are a larger byzygomatic breadth (maximum facial width), anterior malar
projection, rounded eye orbits, an elliptical palate, rounded chin, and shoveled-shaped
dentition. European ancestry often exhibits narrow features, such as a high narrow nasal
aperture, angular orbits, straight facial profile, parabolic palatal shape, and pointed chin
(Birkby et al., 2008; Hefner, 2009; Rhine, 1990). Other distinctive traits that are often
attributed to ancestry are the vault height, anterior nasal spine, and interorbital breadth
(Hefner, 2009). These traits are some of the features that are evaluated, yet it is important to
note that individuals within populations have variable levels of expression, and it is the
expertise of the anthropologist that is able to understand the distribution of traits and
cumulatively make an assessment, not based on one trait, but the entire profile of the
individual. The subjective nature of visual observation creates an opportunity for
inconsistency within the methodology, allowing for interobserver errors. Results are
dependent upon the experience of the observer both in the methodology of forensic
anthropology and the population in question, relying on the ability of the forensic
anthropologist to visually recognize and methodically evaluate population significant traits
(Birkby et al., 2008; Hefner, 2009). Metric analysis examines many of the same skeletal
regions described above, quantifying the variation by taking measurements between
established landmarks. Measurements of the face, nose, and cranial vault are applied to
discriminant functions, suggesting a probable ancestral population. FORDISC can also be
used to generate results that may attribute ancestry; however, the discriminant functions are
based on the case data, population data contributed by other anthropologists, and established
methodology. As mentioned prior, much of the data governing methodology is outdated, and
“the formulae used by anthropologists are only as good as the data that are used to derive them” (Spradley et al., 2008, p. 21).

As can be expected, a major problem with the attribution of ancestry is the limited data for modern populations. Historically, morphological, and metric methodology has been established based on populations of little ancestral diversity. This has become an increasing problem due to the heterogeneity of the US population, specifically the Hispanic-American demographic. According to the United States Census Bureau, Hispanic is anyone with ancestral ties to Mexico, Central or South America, and Spanish-speaking Caribbean nations (Humes, Jones, & Ramirez, 2011). This socio-linguistic grouping poses a problem because it does not take into account population migration, genetic variation, ethnohistories, and other factors that influence the biological profile and the physical traits expressed on skeletons that allow anthropologists to attribute ancestry to UHR (Anderson, 2008; Ross, Slice, Ubelaker, & Falsetti, 2004; Spradley et al., 2008). Biologically, Hispanic populations are a variable mixture of all three ancestral populations (Birkby, 2004; Ross et al., 2004). Depending on the region of origin, the combinations of ancestral traits are expressed differently (Anderson, 2008; Rhine, 1990). For example, people of Cuba generally have a mixture of European, African and Native American ancestry, while Mexican nationals are primarily a mixture of European and Native American ancestry (Birkby et al., 2008; Ross et al., 2004). Because this socio-linguistic grouping does not represent cultural or biological affiliation, anthropologists suggest a reevaluation of the term Hispanic for forensic anthropology, using physical characteristics to group populations by geographic origins, and understanding that there are multiple distinguishable populations under this umbrella term (Anderson, 2008; Birkby, 2004; Birkby et al., 2008; Hurst, 2012; Ross et al., 2004; Spradley et al., 2008). Birkby (2004) and Birkby et al. (2008) further distinguished Southwest Hispanic (SWH) populations through recognizing that populations of Mexico, Latin America (Central and South America), and the southwestern United States are largely a mixture of Native American, and western European populations, identifying nine nonmetric traits that are strongly displayed within this population, and which are used as an effective method of classifying individuals as Hispanic.

Forensic anthropologists have recognized the lack of resources and insufficient information available to anthropologists to properly evaluate ancestry for many UHR of
mixed ancestry, including those presumed to be deceased migrants. Not only has the
community recognized the problem, but they have addressed the issue by developing new
methods that better identify people of Hispanic and other forms of mixed ancestry.

Although in its infancy, a movement is underway to gather data that will help build
the tools necessary to assign geographic origin to Hispanic populations by understanding the
distribution of genetic traits and its influence on population variation. Current literature
shows that forensic anthropologists are working on this problem in many different ways.
Like Birkby (2004), some are adjusting current methods of determining ancestry by
narrowing down traits that are more common in certain populations, such as the SWH vs.
eastern United States Hispanics to create an average range of variation (Anderson, 2008;
Birkby, 2004; Ross et al., 2004). For example, as mentioned above Birkby (2004) identified
skeletal traits that are more common in SWH populations, such as shoveled anterior teeth,
malar projection, short posterior occipital shelf, less elaborate nasal sill, enamel extensions,
little to no oval window, nasal overgrowth, platymeria of the subtrochanteric region and the
sharp medial crest of the femur. Alternatively, Hefner (2009) has developed a statistical
method that allows for multiple traits to be analyzed in a statistical, interdependent,
framework. Hurst (2012) added to the literature by testing the methodologies of Birkby
(2004) and Hefner (2009) for accuracy. Findings indicate that the presence of six of the
morphological characteristics (shoveling, anterior malar projection, enamel extensions, no
sharp nasal sill, wide frontal process, and little to no oval window) presented by Birkby
(2004) are in fact a reliable morphoscopic indication of SWH ancestry. Conclusions
produced by Hefner (2009) were tested with the use of a discriminate function analysis
(DFA). DFA is a statistical calculation that creates a predictive model for group membership
based on the combination of traits (Hurst, 2012). This methodology also produced reliable
results when applied to seven of the traits used by Birkby (2004). Others are using traditional
methods of cranial metrics in combination with post-cranial measurements, morphoscopic
evaluations and technology to go beyond the goal of establishing the ancestry of UHR, but
are working to establish reliable methods to determine the geographic origin of a decedent
(Edgar, 2013; Juarez, 2008; Spradley et al., 2008; Wedel, 2007).

For example, Forensic Anthropologist Kate Spradley is using craniometrics to
determine an individual's geographic origin. It is widely accepted that the use of
craniometrics for population identification is highly accurate when the correct corresponding baseline population was used to create the formulas used during analysis (Spradley et al., 2008; Spradley, personal communication, 2012). Multiple standardized measurements of the skull are taken in order to statistically relate an individual to an ancestral and geographical population. Spradley along with other scientists in Texas, Arizona, and Tennessee are compiling data to determine the variation rates of specific populations where the majority of migrants originate. With this information they hope to be able to determine: sex, stature, age, ancestry, and geographic origin. Although the need to update baseline databases for all ancestral populations in the Americas exists, this effort targets individuals who are from areas of Mexico more commonly to produce migrant populations. In time, forensic anthropologists all over the world hope to have an accurate comparative database and formulae to quickly and accurately generate a geographic profile, pinpointing an individual's region of origin, and therefore increasing the chances for identification and repatriation.

**Pathology**

Pathological analysis of unidentified human remains is another tool used by forensic anthropologists to provide further evidence of the UHR’s personal history and health conditions. Pathological conditions are represented by irregularities in the skeleton. These can be a result of trauma, disease, or genetic anomaly. By understanding the normal process of bone development and degeneration, anthropologists are able to differentiate between true bone abnormalities and the normal range of variation within healthy individuals (Buikstra & Ubelaker, 1994). Additionally, injuries and chronic illnesses that would be serious enough to impact the bone are often treated by medical professionals. This establishes the possibility of having AM medical records and/or radiographs to compare to PM data. For example, broken bones and systemic infections are often reflected in an active state of remodeling, or a healed osseous scar. If AM records are available, the areas of pathology can then be compared to the UHR, with the potential of aiding in the identification. Also, pathology due to repetitive motion rather than disease can be reflected in the musculoskeletal attachments, and speak to the life history of the individual, and occupational stress. Moreover, as previously mentioned, dental pathology can indicate socio-economic status, possibly be documented, and may be used to further establish a personal profile of the decedent. As Birkby et al.
(2008) noted, migrants commonly exhibit dental pathology in the form of carries. In addition to carries, dental pathology can be observed as abscesses, alveolar resorption, antemortem tooth loss, or as any type of degenerative conditions that affects the teeth, alveolar bone, or palate.

A thorough understanding of the natural processes of bone development and degeneration, and a familiarization with boney congenital variations, allow for anthropologists to decipher between genetic irregularities and boney changes that have occurred as a result of life experiences. This information can be helpful when building a personal profile in conjunction with the biological profile.

**Dentition-Adding to the Biological Profile**

Dentition is a highly genetically controlled, important measure of sub-adult development, and reflects population and familial genetic histories (Mayes, 2010). Enamel, the hardest tissue in the body and therefore with the greatest preservation, provides important information through the distinctive dental morphology. Dentition offers multivariate evidence to the biological and personal profile. Dental measurements can add further information regarding variation and sex. Teeth can furnish a variety of information about an individual and his or her life. For example, in the Pima County Medical Examiner’s Office, Birkby et al. (2008) and Anderson (2008) have developed a method of evaluating dentition as a cultural profile to estimate ancestry. Large numbers of carries, AM tooth loss, poorly fitting aesthetic dental covering and other dental modifications are reflections of culture and low socio-economic status and are often associated with SWH migrant populations (Birkby et al., 2008).

Traditionally, age estimations are based on the degree of crown and root development, as well as the eruption stage, and the intermixture of primary and adult dentition (Bosmans, Ann, Aly, & Williams, 2005; Saxena et al., 2010). Tested methods of scoring the developmental stages are used to determine a probable age range. Moreover, dentition can sometimes be a more accurate assessment of age-at-death in individuals with irregular skeletal growth and development due to pathological conditions, such as disease or malnutrition (Megyesi, Tubbs, & Sauer, 2009). In addition, as mentioned above, studies show that specific phenotypic characteristics of enamel development, such as enamel
extension, shoveling, and geometric profiles of the dental arcade, are more commonly observed in certain ancestral populations, than others (Birkby, 2004; Buikstra & Ubelaker, 1994; Edgar, 2013). To the trained eye, observations of these factors can indicate possible ancestry through descriptive methodology. Additionally, certain traits can be considered familial, occurring at higher frequencies in some families or groups than others, and at times indicating regional population variation (Mayes, 2010). However, forensic anthropologists are using these methods in new ways, applying statistics and molecular analysis to dentition for identification purposes. Edgar (2013) developed discriminate functions that combine multiple morphological dental traits to estimate ancestry with accurate results when testing African, European, and Hispanic Americans. On a molecular level, scientists can retrieve DNA and geological and geographical profiles that can give to the unidentified, a name, a home, and a season of death.

**Isotopic Analysis**

Strontium analysis is used to pinpoint the geographic region where an individual grew up. Strontium isotope analysis looks at the individual’s tooth enamel to uncover the isotopic profile imbedded in the tooth enamel. Absorption of strontium occurs during the process of digesting food. It incorporates into hard tissue and leaves a profile unique to the region in which the digested foods were grown. Since enamel does not regenerate, that profile becomes a permanent record and then can be used at a later date to link an individual to a specific geographic region of origin (Juarez, 2008). Since strontium profiles are unique to geographic regions, analysis is only useful when individuals have matured in a region that produces and consumes local food. This way the profile is transferred from soil to tooth enamel by way of food ingestion. Chelsey A. Juarez, a PhD candidate at the University of California Santa Cruz, is currently compiling a database of strontium profiles from teeth donated by individuals who are known to have grown up in identified geographic locations. Her work is focused on the migrant population coming from Mexico and therefore can become an important tool for those trying to identify undocumented migrants.

**Histology**

Histology is a method of microscopically analyzing the molecular structure of bone and teeth. Studies indicate that age-at-death can be estimated by comparing the ratio of
osteons, non-traversian canals, and lamellar bone of long bones (Martrille, Irinopoulou, Bruneval, Baccino, & Fornes, 2009). Kerley and Ubelaker (1978) introduced the standard for histology methods, applying a regression analysis to the bone, creating a tested and reliable method for age estimation (Kerley & Ubelaker, 1978; Martrille et al., 2009).

However, in more recent studies histology has become an important tool, identifying season of death. For example, Wedel (2007) found that during life, dental cementum is deposited in layers of alternating dark and light bands on the tooth root. When observed microscopically, the bands are shown to be laid biannually, in October (winter) and April (summer). The bands that were laid in the winter period appear opaque, and those laid in the summer appear translucent, with the width of the band depicting the duration of the season. These layers also reflect times of biological stress, such as pregnancy, and therefore have the potential to be a source of much more information. Moreover, analogous to tree rings, these layers can also help age an individual. With further study, this method of analysis may be able to contribute greatly to the construction of a biological profile and the identification process. Knowing the season of death can be a telling clue in identifying deceased migrants. Due to the nature of migration, family members may be able to indicate the season of crossing. Therefore, with the accumulation of biological and cultural profiles, season of death can significantly narrow the scope of possible IDs, and potentially lead to identification.

**DATABASES-NEW TECHNOLOGICAL RESOURCES FOR ID**

A relatively new method of identification is using computer-based information systems to create databases that accumulate and cross-reference biological and cultural data. Multiple systems have been created to help law enforcement with criminal evidence, linking criminal and biological information to a specific person in order to identify a criminal perpetrator. Recently, databases have become an essential tool in identifying missing and unidentified persons. Local, state, and federal agencies use this technology to enter, store, and cross reference antemortem (AM) and postmortem (PM) data, hoping to match information, leading to an identification. The majority of the evidence supplied to these databases is produced by forensic anthropologists and pathologists during autopsy or skeletal analysis. Being able to cross-reference AM descriptions given in a missing persons report with PM biological profiles increases the opportunity for UHR to be identified.
**Information Accumulation**

Most databases used for identification in the United States are focused on collecting information from US residence and forensic cases within US jurisdiction. This obscures the process of identifying deceased migrants by overlooking them. In cases where UHR are presumed to be migrants, access and distribution of information becomes complicated. Communication with the proper legal jurisdictions and next of kin is not straightforward; it becomes an international, multi-government and multi-agency issue. Databases can help organize AM and PM data to best suit the issue at hand. DNA, AM descriptions, PM biological profile information, and personal effects are all pieces of information that can be accumulated from various sources and entered as a single profile into identification and criminal databases. Each database has an agenda and can compare portions of a profile to the information stored in the database. Some are exclusively for positive identification, analyzing DNA or fingerprints, and some only accept presumptive evidence, such as AM descriptions and pictures. However, the majority try to gather as much information as possible, so the most reliable results can be produced. Multiple databases that are able to address the issue of identification are available to law enforcement; however, few of those are accessible by the public. Databases available to San Diego agencies and the general public that are designed to aid in the identification of missing persons and/or unidentified human remains are: UNTCHI, MUPS, SIRLI and NamUs. These databases operate individually by collecting both physical and circumstantial evidence and are utilized by various tiers of legal jurisdiction: local, state, federal, and international.

**DNA-Admission and Submission**

Policy makers, law enforcement, and victim advocates are continuing to encourage and enforce the use of DNA databases for criminal and identification purposes. Legislation reflects these concerns and the growing acceptance of DNA being a critical tool for identifying criminals, the missing, and unidentified. Since the National DNA Indexing System was launched in 1998 by the FBI, multiple laws, enforcement codes, and Acts of Congress have made DNA a normal part of the legal process, accessible by federal, state, and local law enforcement, and in some cases by the general public.
For identification purposes deoxyribonucleic acid (DNA) is divided into two types: mitochondrial (mtDNA) and short tandem repeat (STR DNA) (Federal Bureau of Investigation). MtDNA is part of the DNA profile that follows the maternal inheritance and is comparable to an individual's maternal relatives. Moreover, due to the longevity of the molecular structure, it is a powerful tool for identification of missing and unidentified human remains (Nelson & Melton, 2007). STR DNA is a short strand of nuclear DNA containing genetic information from both parents. STR DNA is a reliable method for identification due to the stability, durability, and certainty of the genetic profile (Rucinski, Malaver, Yunis, & Yunis, 2012). MtDNA is used when the remains submitted are not suitable for STR DNA testing. Bone shafts, teeth and hair follicles are not amenable to STR DNA, so in cases where the remains are fragmented or poorly preserved due to exposure to the elements, or when only small pieces are located, mtDNA is utilized. For these reasons official DNA laboratories ideally collect samples from maternal relatives. Paternal samples are also acceptable but are not usually necessary when maternal samples are available. All DNA indexing systems used for official identification purposes have their own code methods of operation but unite in the common goal to use their assets in combination with all available resources to give identity to the unknown. Some of the databases that are more commonly used to identify deceased migrants will be discussed below. Additional resources will be discussed in the appendix (Appendix A).

**Databases listed by Jurisdiction**

The databases discussed below are organized according to primary jurisdictional accessibility and use.

**FEDERAL**

Nearly 20 years ago the United States federal government passed legislation, the DNA Identification Act of 1994, allowing for a national DNA database. This gave the go-ahead to federal agencies to gather, store, analyze, and use DNA information in a legal context. This initiative enabled the Federal Bureau of Investigation (FBI) to use their indexing systems on a national level. The Combined DNA Indexing System (CODIS) had been created as a pilot program in 1990 by the FBI, serving 14 states and laboratories, and with the authority of the DNA Act of 1994 the FBI created a National DNA Indexing System
At this point CODIS was the parent program, which accumulated and processed all DNA information. NDIS helped lighten the load by focusing on matching DNA profiles to criminal cases.

In 2000 the DNA Backlog Elimination Act was passed and provided grants and other funding for agencies to eliminate DNA backlog and allow for improvements in the processing of DNA records. That same year the FBI developed another branch of CODIS, the National Missing Persons DNA Database (NMPDD). The focus of this division is on DNA analysis for the identification of missing persons (Federal Bureau of Investigation, n.d.a). In 2004 the Justice for All Act was initiated to establish more enforceable rights for victims and allow for more funds to be available for improvements to the DNA labs and databases that provide crucial information for law enforcement. NMPDD are fed by local, state and federal forensic laboratories. The DNA samples and other physical evidence are processed by federally accredited laboratories only.

The Center for Human Identification at University of North Texas (UNTCHI) is one of the accredited labs that work directly with the FBI databases to aid in the identification of UHR through anthropological and DNA analysis (Center for Human Identification's Laboratory of Forensic Anthropology, n.d.). UNTCHI is a manifestation of what legislators, law enforcement, and scientists all hope to achieve by initiating programs that target missing and unidentified persons cases, bringing anthropology, forensic science, DNA, and law enforcement all under one roof. Private citizens as well as any law enforcement entity can submit profile information as a potential match to an existing unidentified persons case, or as a missing persons case, hoping to match an existing case, or provide information that will potentially lead to an identification. CODIS and UNTCHI both have information for the public on how DNA samples and AM information are collected and submitted to these resources (Center for Human Identification's Laboratory of Forensic Anthropology, n.d.; Federal Bureau of Investigation, n.d.b).

In 2003 the President's DNA Initiative was launched, further expanding funding and resources to DNA laboratories and facilitating programs. In 2005 a national meeting 'Identifying the Missing Summit' was called to address the issue of missing persons and growing numbers of unidentified human remains, which has come to be known as "The Nation's Silent Mass Disaster" (Ritter, 2007). In response to concerns expressed by the
public and the Summit attendees, including local, state, and federal law enforcement, policy makers, judges, lawyers, forensic scientists, anthropologists, medical examiners, and coroners, the National Institute for Justice (NIJ) initiated a task force specifically to address the problem of the missing and unidentified. CODIS databases had been in existence for some years, but they proved insufficient, and since the FBI's main concern is crime, the NIJ decided that the addition of a database focused on identification was necessary, "Much of NIJ's work has focused on developing tools to investigate and solve the cases of missing persons and unidentified decedents" (USDOJ, n.d.a). Therefore, NIJ created NamUs, a system that not only allows access by multiple jurisdictions, but it also stores and allows access to anthropological analysis, demographics, dental records, and individual physical anomalies, trauma unique to the individual, all of which may help with identification. NamUs is the product of a national concern for the missing and unidentified, addressed by the collaborations of the attending parties of the 2005 meeting. It is a system of databases that compiles and cross references information from Medical Examiners, Coroners, law enforcement, and relatives of the missing and unidentified. NamUs maximizes the DNA technology and information in the criminal justice labs, providing officials with a diverse tool to aid in identification. NamUs provides free testing and forensic services, including anthropological and dental assistance (USDOJ, n.d.a).

Access to information was further enhanced and expanded with the National DNA and Fingerprint Act of 2005. This Act mandates that all Coroners and Medical Examiners extract a DNA profile and fingerprints when possible and submit the evidence to the FBI database CODIS, and as of July 2011 samples must be submitted to NamUs. There are a number of federal, state, and local tools that aid in identification of individuals in both criminal cases and unidentified or missing status, but for the purposes of this study only those that offer assistance in the identification of undocumented decedents will be discussed.

**STATE-CALIFORNIA**

In 1960, California implemented a new task force, Missing Persons Unit (MPS) which focused on missing persons cases, collecting dental records of the missing for comparison and identification purposes. In 1979 the unit was expanded to include unidentified human remains and named, Missing and Unidentified Persons Unit (MUPS).
MUPS gathers dental records, physical descriptions, and anthropological information which can now be entered into databases (State of California Department of Justice, n.d.a). In 2001, California State Penal Code 14250 was passed, requiring all Medical Examiner and Coroner offices to submit DNA samples of all unidentified human remains to the California Department of Justice. In response, California added a new branch to their criminal DNA database, the Missing Persons DNA Database, which collects DNA samples from UHR and possible next of kin for identification purposes only (State of California Department of Justice, n.d.a). In 2004, California legislators passed Prop 69, DNA, Fingerprint, Unsolved Crimes and Innocence Protection Act, which gave California Department of Justice the opportunity to expand and improve their identification resources, making California databases compatible with CODIS (State of California Department of Justice, n.d.b).

**PRIVATE**

Private databases operate under private funds and are not in association with state, local or federal systems, but they do work within the same circle of information and have the same goals. "The Doe Network" is a popular digital network that accumulates information on Doe cases and attempts to locate an identity. Volunteers work with law enforcement and the public to help identify Jane and John Does cases. Cases are published on their website for full public access. Additionally, the network will take missing persons cases, and attempt to match AM information with known Doe cases. Since their start in 2001, they have contributed to over 66 identifications (Doe Network, n.d.).

**INTERNATIONAL EFFORTS**

Mexico and El Salvador have implemented databases to aid the international community in the identification of deceased migrants with SIRLI and COFAMIDE.

**Mexico**

Mexico acquired a US constructed database that accumulated AM evidence submitted by the public and PM data entered by law enforcement agencies. System for the Identification of Remains and Localization of Individuals (SIRLI) was created in the US by Doctors Lori and Erich Baker, and was later transferred to the Mexican government. This system helped identify deceased migrants by offering unique resources to receive data from
legal agencies and the public across borders, allowing public access, and by encouraging law enforcement, anthropologists, and foreign nationals to use it. Unfortunately, SIRLI is not currently active, but Mexico is working with ImageWare and Bode Technology to reestablish the database in the near future (M. Alverdi, personal communication, 2012; Olavarria, personal communication, 2012; Bode Technology, n.d.)

**El Salvador**

Comité de Familiares de Migrantes Fallecidos y Desparecidos, El Salvador (COFAMIDE) is a database system that began in 2006 in response to the actions taken by family members of missing migrants in El Salvador. With the collaboration and support of the El Salvadorian people, government and the Argentine Forensic Anthropology team, a DNA database has been created that utilizes information from international sources, including the US, Mexico, Guatemala and El Salvador. In Arizona, COFAMIDE teamed up with a DNA lab in Pima, Arizona, to cross-reference DNA samples from individuals across borders. Since commencement of COFAMIDE in 2006 they have identified 59 individuals (Godoy, 2011; Comité de Familiares de Migrantes Fallecidos y Desparecidos de El Salvador, n.d.).

While there are various databases available to law enforcement and the public that can be used for identification purposes, the application and utilization of the information is limited to information available, time, personal resources, and money. As discussed above, information comes in two major categories: presumptive and positive. DNA is an ideal source of positive identification due to the conclusive nature of DNA analysis, but it is limited to available data. The older and more fragmented unidentified human remains are, the less likely a viable DNA profile can be decoded (Misner et al., 2009). Also, when a usable sample is attained the appropriate comparison sample must be available. Family must submit DNA profiles for comparison, and therefore the appropriate familial DNA donors must be located. In some cases the individual will be identified through the comparison of anthropological analysis and antemortem radiographs, comparing unique osteological markers both natural and from trauma, and dentition. These forms of identification are also limited to the information available for comparison. Locating information that may match PM evidence for possible identifications takes a lot of time and resources, which many law
enforcement and other public agencies do not have. "Some officials say they have neither the time nor the resources to enter missing and unidentified human remains data into the system" (Ritter, 2007). Without the information being entered into the appropriate databases the information is not able to provide any assistance in the identification process and is virtually useless. In the past, funding was a primary factor in the inability to allocate personnel to missing and unidentified human remains cases. Luckily, as discussed earlier, recent legislation has passed providing more funding for missing person and unidentified human remains identification efforts. Entering information on the missing and unidentified is now a mandate and the federal government provides funds for identification indexing systems and DNA labs that provide identification services. As San Diego's Medical Examiner Dr. Glenn Wagner states in his annual report, "The identification of a decedent is one of the most critical functions of the Medical Examiner's Office and must be made by official and verifiable means" (Wagner, 2011). By quickly and efficiently supplying the databases with accurate and appropriate identification-related information, the burden of identification is shared across agencies and therefore carries a better chance of fulfilling the critical function of a positive identification.
CHAPTER 8

REPATRIATION-RESULTS-REFLECTION

Repatriation is the end goal for all displaced decedents. Returning people home after death provides closure for the living. Providing this service is a necessary yet often complicated process for individuals involved in repatriation efforts of foreign nationals. This study originally set out to provide a clear picture of the repatriation process followed in San Diego County. However, upon the realization that a defined protocol does not exist in the county, the focus naturally redirected to exploring the procedures followed by the individual agencies that are, in part, responsible for the eventual identification and repatriation of deceased migrants. As a result, instead of presenting a comprehensive understanding of the protocol for repatriating deceased migrants, this study has unveiled the roles of each agency, the tools available to aid in identification, gaps in communication between agencies and individuals who report the discovery of human remains, and has made demographic and regional predictions as to when and where unidentified human remains (UHR) of a deceased migrant may be found. Additionally, this chapter will offer some insight into how San Diego Medical Examiner's Offices (SDMEO) and other jurisdictions handle deceased migrants, and offer suggestions as how to improve available resources and implement new resources that may simplify and expedite the reporting process.

AVAILABLE RESOURCES IN SAN DIEGO

In San Diego, all unidentified individuals are processed through the Medical Examiner's Office and deemed "Jane Doe" or "John Doe." Identified human remains and UHR cases are processed equally for medico-legal purposes. Differences being that identified individuals are released to family, or held until family can be located, and UHR are processed for identification and remain Does (J. Estrada, personal communication, 2013). After 30 days a body is determined to be abandoned; therefore, the unidentified and abandoned human remains can be disposed of. Unidentified human remains are buried to
allow for possible identification in the future, while identified abandoned remains are always cremated (Wagner, 2011).

Depending on their condition, UHR undergo postmortem examinations by pathologists and/or anthropologists to answer medico-legal questions, such as cause of death and identification. In cases where the remains are skeletonized, or in advanced stages of decomposition, forensic anthropology is applied to address these medico-legal concerns. The information gathered during examination is used to create a biological profile, and then entered into the SDMEO database, which houses all reports generated by the office personnel (J. Estrada, personal communication, 2013; G. Geary, personal communication, 2008). These records can be accessed by the SDMEO to relay information about a decedent's biological profile, contextual evidence, and personal effects. SDMEO investigators can reference the autopsy and evidence reports for individuals to try and infer a potential identification of an individual, based on missing persons’ reports. In addition to in-house accessibility, all records pertaining to a potential identification are entered into the National Crime Information Center (NCIC), which searches criminal profiles for identification. Also, DNA samples, the biological profile, and personal effects are provided to the California Department of Justice (CADOJ), which feeds into the national identification databases, CODIS and NamUs (J. Estrada, personal communication, 2013; Wagner, 2011). The SDMEO is tasked with handling over a thousand deaths a year, and identifying Does can consume an amount of time and funds, which is limited. However, the investigators in the SDMEO make extreme efforts to identify the unidentified by searching through missing persons reports and submitting the required information to appropriate labs. In addition, when individuals are suspected of foreign nationality, investigators at the SDMEO contact the appropriate Consulate to help identify an individual or to contact the next of kin for the release and repatriation of human remains (G. Geary, personal communication, 2008).

Upon identification, the remains of undocumented migrants are released to the appropriate government (J. Estrada, personal communication, 2013; G. Geary, personal communication, 2008; J. Olavarria, personal communication, 2013). Typically, most deceased migrants are from various regions of Mexico, and therefore the Mexican Consulate is often involved. When a person of Mexican nationality is identified, the consulate is notified, and the Department of Homeland Security takes possession of the remains (J.
Estrada, personal communication, 2013). The process of repatriation is not explicitly divulged by sources at the Mexican Consulate in San Diego, but gathered from the information provided; bodies are transferred to specific morgues or Coroner’s offices to await repatriation (M. Alverdi, personal communication, 2012; J. Olavarria, personal communication, 2013). From this point, if next of kin has not been identified, the body remains in the US facilities until the Mexican government can do so. Families of the decedents have the option of hiring a private company to arrange the transportation of the remains back home, or the Mexican government will assume the logistic and finical responsibility for repatriation (J. Olavarria, personal communication, 2013). Surprisingly, there is some discrepancy among government officials spoken with and reported incidents of repatriation costs and coverage. According to Secretaria de Relaciones Exteriores (SRE), which is the Mexican equivalent to the US State Department, repatriation costs are covered by the Mexican government (J. Olavarria, personal communication, 2013). However, that does not seem to be the understanding of the general migrant population. Rather, it is commonly thought that the Mexican government does cover a portion of the costs, but not the entire operation (E. Morones, personal communication, 2012). Either way, it is agreed that the SRE does play a pivotal role in the multi-variant process of repatriating deceased Mexican nationals.

Available Resources Across Borders

As discussed in the previous chapter, databases that cross-reference biological and material evidence are considered an invaluable resource for identification in the US. However, the US and foreign governments have yet to come together on the issue of identification and repatriation of deceased migrants. Currently, El Salvador implements the most advanced method, following the lead and direction of the established Argentine Forensic Anthropology Team (EAAF). They have created the COFAMIDE, as discussed in the previous chapter, which utilizes forensic anthropology and DNA documentation to help identify people who have succumbed to the obstacles faced during a migrant's transnational journey (www.eaaf.org; www.cofamide.blogspot.com). Mexico is also developing their own databases for identification purposes. According to the SRE, Mexico hopes to reemploy SIRLI, and develop further software that uses antemortem and postmortem data along with
biometrics and DNA profiles to identify Mexican nationals located on both sides of the border (J. Olavarria, personal communication, 2013). Additionally, US law enforcement agencies, academics, and those in the forensic community have become increasingly aware and concerned with the dilemma of unidentified deceased migrants and the need for comprehensive protocol that leads to repatriation.

**OTHER RESOURCES WITHIN THE US**

Every state and every county within the state has its own “in-house” systems for identification and repatriation of deceased undocumented migrants. However, they are dictated by the legal statutes and protocols of the state and federal government. In San Diego, when identification is present and easily confirmed the remains are relinquished to the individual's country of citizenship. However, when identification is not provided, the Medical Examiner's Office or the county Coroner's office implement unique protocols to act in compliance with state and federal statutes, and aid in the identification of all Does: undocumented migrants and citizens alike.

**Pima County, Arizona**

Pima County, Arizona, is known for having the largest volume of undocumented migrant fatalities since the enforcement changes in the early 90s, with 230 border crossing deaths in 2010 alone (Pima County Forensic Science Center Office of the Medical Examiner, 2010). In response, they have developed one of the most efficient and technologically robust labs in the entire border region. Due to the environmental factors of crossing through the Arizona deserts, many border crossing related deaths are recovered as skeletal remains and therefore impose extra challenges to authorities to identify the human remains. Pima County Medical Examiner's Office (PICMEO) has built a successful team and facility that uses state-of-the-art technology and traditional forensic anthropology to identify and repatriate undocumented migrants. As a result of the National Defense legislation of the 1990's and on, Pima County was faced with an exponential influx of migrant traffic, and the subsequent death toll (Anderson, 2008; Hinkes, 2008). The team at the PICMEO has been able to tackle this situation by accessing as many resources as possible to create a detailed profile of the individual. They have relationships with the foreign consulates, and other forensic anthropologists throughout the U.S. that lend expertise in various specializations, such as
skull-photo superimposition, foreign documents, and DNA analysis (Anderson, 2008; Birkby et al., 2008; Fenton, Heard, & Sauer, 2008). Birkby created a standard biological profile specific to South West Hispanic populations, which is based on the data accumulated at the PICMEO and shared with the rest of the forensic community (Birkby, 2008). In combination with population specific methodology, exploitation of all resources, and DNA testing PICMEO has been successful in identifying 64% of undocumented migrants since 2001 (Pima County Forensic Science Center Office of the Medical Examiner, 2011).

Maricopa County, Arizona

Maricopa County is located in the central southwestern limits of Arizona with its Medical Examiner's Office located in Phoenix, Arizona. This location does not actually share any regional borders with Mexico, but still facilitates a number of undocumented migrants from Yuma, Arizona. Although their focus is not largely on identifying the border crossing population, they have developed a tool available to the general public that allows people to search for their missing kin on their own. Maricopa County developed the Unidentified Persons Bureau, which lists UHR with a description and/or an autopsy photo (Maricopa County Arizona Office of the Medical Examiner, 2013). This is an online database that is completely accessible to the general public, law enforcement, and other agencies that try to locate missing persons. It lists their Doe cases along with descriptions and pictures of the decedent and personal effects. This is a helpful tool when people from foreign countries are trying to locate someone who may have perished. It is extremely user friendly, and nonthreatening due to that fact that anyone, anywhere who has access to the Internet can search through photos for their missing kin.

Conclusion

Forensic anthropologists are recognizing that their methodologies, which has been developed and applied over the years, need to be expanded to include populations of mixed ancestry. In the United States, metric and non-metric methodologies used to estimate age, sex, stature, and ancestry were created based on European and African American skeletal data. Therefore, when applying the formulae and methods of analyses that build a biological profile, the results may not be entirely accurate. This inaccuracy is a problem because one of the most important roles forensic anthropologists play is being able to help identify skeletal,
or severely decomposed human remains. Much of the profile is dictated by the decedent's ancestry, meaning that population variation is a crucial variable in determining how to apply metric and non-metric methodology to human remains. In the United States, and specifically the U.S.-Mexico border regions, Hispanic populations pose the biggest identification problem. Up until the 1990s, Hispanic populations were included in Caucasian ancestry and analyzed using methodology that was specific to Caucasian populations (Birkby et al., 2008). Because Hispanic populations are, on average, more gracile and smaller than Caucasian populations, this inaccurate categorization leads to inconsistencies when trying to build the remainder of the biological profile (Anderson, 2008; Birkby, 2008; Spradley et al., 2008). Additionally, forensic anthropology has recognized that Hispanics are also extremely diverse, based on geographic origin. The ratios of mixed ancestry can be predicted and accounted for based on where in Mexico, Central or South America, or Spanish-speaking Caribbean nations the decedent is from (Ross et al., 2004). Forensic anthropologists continue to revise methodology on population specific data to create accurate biological profiles, while improving technology and global awareness, in their ongoing effort to aid in identification of the unidentified.
There are many factors that contribute to a person's decision to leave home to look for work in a foreign land. Political, economic, and social pressures can easily drive people to abandon their country in hopes of finding a better life elsewhere. Unfortunately, the means to do so are not always easily attained. Lack of opportunity encourages migration and desperation drives people to make grave decisions such as crossing borders illegally. Some successfully fulfill their dreams; however, others succumb to the fatal obstacles that challenge undocumented migrants. They are in a unique situation where the reason for their predicament is a global institutional problem fueled by economics and politics. Historical factors, international policy, and the physical environment that they travel through all contribute to their demise, and after death they are in the hands of agencies governed by the politics of the nation in which they died. The repatriation effort relies on science and humanitarian groups to provide a voice for those who cannot speak and compassion for humans in life and death.

The original goal of understanding the existing protocol for repatriating deceased migrants in San Diego was overshadowed by the reality that such a protocol does not exist. Rather, the focus has been directed towards evaluating the methods of collecting information, and the communication between and within agencies on both sides of the border. The most crucial step in the process is not the repatriation, but the identification of the remains in question.

The knowledge and methodology of forensic anthropologists provide the biological and personal information that allow for a recognizable physical description to be created. Once identification is achieved, the repatriation process is relatively straightforward and uncomplicated for San Diego agencies; the body is relinquished to the country of origin. Many problems that make identification more difficult occur between the time the body is discovered and when it reaches the San Diego Medical Examiner's Office for professional processing. Many times information is overlooked when reporting the location of a
decedent, and the lack of an available "check sheet" allows for inconsistent information to be recorded and reported. This practice facilitates miscommunication between the people who locate the remains and the SDMEO, who collect the remains. This can result in incomplete documentation and possible loss of evidence. In order to try and close the gap in communication, a suggested template has been designed for documenting the scene by the party responsible for locating the remains (Appendix B). The information required for the check sheet is attainable by visual observation and no disturbance of the scene is required.

The goal of these documents is to give companies or individuals recourse to better record what they observe and to be able to transfer that information to the appropriate legal agency. If these resources become available to the general public in an easily obtainable manner, a documentation paper trail may become a viable resource to the general public and legal agencies alike.

In addition, a directory of available resources, such as DNA labs and identification websites is included as Directory (Appendix C). This piece of consolidated information may be able to help the general public, private and public agencies, government and legal agencies, and all other parties who are or want to become involved in the process of identification and repatriation. As Sir Francis Bacon said, "knowledge is power," and this information is designed to be used by all to further their knowledge in the tools and resources available in efforts to identify and repatriate those who met their fate so far from home.

Two last issues to address are the fear undocumented people have of reaching out to law enforcement when someone does go missing, and the lack of resources families have to access to available information. Many are encouraged by US citizens to contact the FBI, the Coroner’s Office, or Medical Examiner's Office of the county where lost loved ones are thought to have crossed, yet hesitate in fear of retaliation by the US government (E. Morones, personal communication, 2013). Accessible resources such as NamUs and the UNTCHI allow people from anywhere to submit antemortem data and DNA samples for identification purposes. These resources can be very important to families of lost loved ones; unfortunately, in addition to fear of retaliation, many do not have access to current technology. Also, if computer and Internet resources are available, few know where to start. Programs like System for the Identification of Remains and Localization of Individuals (SIRLI) and Comité de Familiares de Migrantes Fallecidos y Desparecidos (COFAMIDE)
are invaluable resources because they target populations who have a greater potential for needing them.

A more fluent and successful process of repatriation may be achieved with standardization, synchronization, tolerance, and communication between and within international communities of legislators, law enforcement, and forensic scientists.
REFERENCES


**WORKS CONSULTED**


NamUs. (n.d.a). *About*. Retrieved from [www.namus.gov/about.htm](http://www.namus.gov/about.htm)

APPENDIX A

DATABASES
Identification Databases

FEDERAL

CODIS: Combined DNA Index Systems & Nationals DNA Index System (NDIS)

URL: http://www.fbi.gov/about-us/lab/biometric-analysis/codis

About: The United States Federal Bureau of Investigation's laboratory started CODIS as a pilot program in 1990. In 1994 with the passing of the DNA Identification Act into legislation the Federal Government was able to officially establish a DNA index. Following the Act of 1994 the National DNA Index System (NDIS) was created and implemented in 1998. The NDIS serves as a major part of CODIS, housing DNA profiles of "convicted offenders, arrestees, legal, detainees, forensic (casework), unidentified human remains, missing persons and relatives of missing persons as well as requirements for participating laboratories relating to quality assurance, privacy and expungement" as permitted under the DNA Identification Act of 1994. CODIS works by comparing DNA profiles from a number of accredited databases. It is able to compare both mitochondrial DNA (mtDNA) and nuclear DNA (nDNA) across databases containing profiles of criminal offenders, missing persons, unidentified human remains, and families of missing persons. This allows law enforcement to have a centralized, multi-tiered, and highly sophisticated identification tool. It aids in the identification of criminal perpetrators and missing or unidentified people.

Services: CODIS is the database that manages all the feeding databases throughout the country by functioning through a three tiered hierarchical system; local, state, and federal agencies can contribute data and receive results. Local DNA Index Systems are usually operated by local law enforcement agencies and are able to feed DNA data into State level Index Systems (SDIS) and from there the SDIS send DNA profiles and accompanying data to the FBI laboratories which are then filtered into the appropriate CODIS databases. California and national legislation require DNA samples to be taken from unidentified human remains if and when possible. In the case of fragmented, incomplete, or disfigured and unidentifiable remains, multiple samples may be submitted for identification purposes.
Although the main function of CODIS is to aid law enforcement with criminal cases, identifying criminals and linking them to multiple crimes, it does serve law enforcement in other ways.

*Availability:* State and Federal Agencies

**NMPDD: The National Missing Persons DNA Database**


*About:* In 2000, using existing portions of the CODIS databases, the FBI created a database specific to missing and unidentified persons. The National Missing Persons DNA Database (NMPDD) was created utilizing the criteria described in the DNA Identification Act of 1994 to specifically target the missing persons and unidentified human remains cases that plague the country.

*Services:* Like other CODIS databases it uses mtDNA and nDNA to cross-reference profiles of unidentified human remains to the existing collection of missing persons and family of missing persons. DNA profiles of victims and kin alike are able to be submitted to CODIS/NMPDD at anytime, but unlike the home kits distributed by UNTHCI the samples must be produced in the presence of and submitted by an appropriate law enforcement agent or agency (DNA Identification Act of 1994).

*Availability:* State and Federal Agencies

**NamUs: National Missing and Unidentified Persons System**

*URL:* http://www.namus.gov/index.htm

*About:* NamUs is the product of a national concern for the missing and unidentified, addressed by the collaborations of the attending parties of the 2005 meeting. In 2003 the President's DNA Initiative was launched, further expanding funding and resources to DNA
laboratories and programs facilitating programs. In 2005 a national meeting, "Identifying the Missing Summit" was called to address the issue of missing persons and a growing number of unidentified human remains. In response to concerns expressed by the public and the Summit attendees, including: local, state, and Federal law enforcement, policy makers, judges, lawyers, forensic scientists, medical examiners, and coroners, the National Institute for Justice (NIJ) initiated as task force specifically to address the problem of the missing and unidentified. CODIS databases had been in existence for some years, but they proved to be insufficient, and with the FBI's main concerns being of a criminal nature, the NIJ decided that the addition of a database focused on identification was necessary. Not only does this system allow for access by multiple jurisdictions, but it also stores and allows access to anthropological analysis, demographics, dental records, and individual physical anomalies (trauma unique to the individual), which all may help with identification. Any kin present in the US can file a missing persons report and theoretically can have DNA samples taken and entered into CODIS and NamUs (NamUs, personal communication, 2012). NamUs offers all services in Spanish to assist relatives of missing persons with the processes.

Services: It is a system of databases that compiles and cross references information from Medical Examiners, Coroners, law enforcement, and relatives of the missing and unidentified. NamUs maximizes the DNA technology and information in the criminal justice labs, providing officials with a diverse tool to aid in identification. NamUs provides free testing and forensic services, including anthropological and dental assistance. DNA samples from both the missing or unidentified and relatives are collected for analysis. The biological parents are the ideal samples, giving the laboratories a complete usable profile. If both parents are not available, one parent plus a sibling is preferred and if those samples are not available the preferred samples begin to differentiate depending on the sex of the missing person or unidentified human remains. Relatives generally submit a saliva swab sample per the sample kit given by the responsible lab, either a FBI lab, UNTCHI, or one of California's accredited DNA labs.

Availability: Federal, State, Local Agencies, and the General Public
**UNTCHI:** University of North Texas Center for Human Identification

*URL:* www.unitchi.org

*About:* UNTCHI was created in 2004 as part of the University of North Texas at Denton's Forensic Science program. It has the staff, equipment, and experience to obtain, process, and potentially identify the unidentified through a number of methods. This lab is unique in that it uses forensic anthropological data in concert with other more common methods of ID, such as DNA and fingerprints.

*Services:* Analysis of forensic and biological data sent in from civilians and law enforcement agencies. Forensic services offered by the UNTCHI include an anthropological analysis that gathers postmortem information from the unidentified victim and produces a profile that can be compared against any antimortem information gathered. This analysis would look at the following: biological profile, the age, sex, height, ancestry of the individual, and pathology; any pathological evidence such as injuries, dental work, physical anomalies, and postmortem interval; comparison to any antimortem evidence for positive identification or exclusion; and entry of a DNA profile into the FBI DNA database CODIS. These services can be extremely helpful in the right circumstances and when the law enforcement handling the case does not have access to a Forensic Anthropologist.

*Availability:* United States Law Enforcement Agencies and Civilians

**US-VISIT:** United States Visitor Visa Program

*URL:* http://www.dhs.gov/us-visit-biometric-identification-services

*About:* US-VISIT is DHS's visitor's visa and identification program. US-VISIT houses fingerprints and photos of all individuals in possession of a United States Visitor's Visa for identification purposes; it is not a criminal database. US-VISIT accesses the Biometric Support Center (BSC), which provides biometric data to many federal, state, and local agencies. The FBI and DHS are currently in the process of making IAFIS/IDENT
interoperable with US-VISITS's biometric databases to further the ability of all law enforcement to identify individuals quickly and accurately. US-VISIT contains the identification profiles of foreign nationals entering the United States under legal conditions. However, if the legal status of the individual changes and attempts to enter the US illegally, those prints and picture become very helpful in identifying an unidentified decedent.

*Services:* Accumulates, stores, and provides bio-metric information of foreign nationals who are in the United States, or have been in the US on a Visa.

*Availability:* Military and Federal law enforcement agencies

**IDENT Automated Biometric Identification System**

*URL:* http://www.dhs.gov/xlibrary/assets/privacy/privacy_pia_usvisit_ident_final.pdf

*About:* In 1994 as part of the "Operation Gatekeeper" movement, the US Border Patrol (now under the jurisdiction of DHS) implemented an identification system using fingerprints. Prior to this system, identification by fingerprints was a long laborious process that could take weeks to months. IDENT scans a single index fingerprint into a centralized database, which can be accessed instantaneously. Its primary use is to identify criminals who attempt to unlawfully enter the United States. A single fingerprint is taken when foreign nationals are returned across the border after being apprehended for any illegal activity from criminal assault and/or possession, to illegal entry into the US. These prints are then used to evaluate the risk, status and identification of people who want to cross the border into the United States legally through US-VISIT. Recently IDENT resources have been combined with the FBI's fingerprint database IAFIS to give Border Patrol agents and other law enforcement agencies access to both identification databases at the same time.

*Services:* Accumulates, stores, and cross-references fingerprints taken from foreign nationals apprehended for criminal misconduct. Data can be compared to unidentified human remains.

*Availability:* Law Enforcement, Military, and Federal agencies.
IAFIS- Integrated Automated Fingerprint Identification System

URL: http://www.fbi.gov/about-us/cjis/fingerprints_biometrics/iafis/iafis

About: In 1999 IAFIS was launched as the first ten-print fingerprint database to be launched. Prior to the initiation of the program, ten-print fingerprint analysis was very labor intensive and time consuming, taking weeks to complete such an analysis. With the implementation of IAFIS, comparison and identification could be accomplished in minutes. IAFIS is the largest bio-metric database in the world, housing both criminal and civilian prints. The database holds more than 100 million profiles, which are available to law enforcement for identification purposes. The criminal profiles include prints of arrested and detained individuals. All persons processed through the legal system are subsequently printed, and those prints are then available to be stored within the IAFIS, upon voluntary submittal by the acting law enforcement agency. Not only does IAFIS store fingerprints, but it also stores and makes available corresponding information on an individual’s identity: tattoos, scars, pictures, physical descriptions criminal record, etc. In 2001 the Border Patrol began using IAFIS simultaneously with their existing IDENT. With the creation of DHS, IAFIS continued to be an important part of border security. Individuals who enter under US-VISIT have to be printed and scanned as they enter the United States. Also, all foreign nationals detained and returned across the border are printed and profiled in IAFIS. In the more than ten years of use, IAFIS has helped identify many individuals with prior criminal records. Another advantage of IAFIS is to identify unidentified deceased migrants. In cases where individuals have attempted to cross before and were sent back or were deported after living in the US for some time, they may have an existing profile in the database. This method of identification is limited to the availability of usable prints and as mentioned previously the condition of undocumented migrant remains are often compromised by the elements. Furthermore, every case is unique and methods of attaining fingerprints are becoming more advanced and offering some hope for identification.
**Services:** IAFIS is the Federal Bureau of Investigation's automated fingerprint system. It uses a ten finger database that is comparable against any or all fingerprints submitted. It is available 24 hours a day and 365 days a year to assist local, state, federal, and in-house detectives solve crimes and quickly identify individuals in question. Currently IAFIS is the most current fingerprint database in the country and is accessible by law enforcement agencies all over the country.

**Availability:** Military and Federal Agencies

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**State-California**

In 2001 the State Penal Code 14250-14252 was passed, requiring all Medical Examiner and Coroner offices to submit DNA samples of all unidentified human remains to the State run DNA lab. In compliance with the Penal Code, the samples are made compatible and submitted to FBI's CODIS.

**MUPS: Missing and Unidentified Persons Unit**

**URL:** http://ag.ca.gov/missing/content/mups.php

**About:** California was the first state to create its own, state run, missing persons database. In 1960, California implemented a new task force, Missing Persons Unit (MPS) which focused on missing persons cases, collecting dental records of the missing for comparison and identification purposes. In 1979 the unit was expanded to include the unidentified human remains (MUPS) and works to identify missing and unidentified persons through cross-referencing physical evidence such as personal effects and the biological profile that had been created during autopsy by forensic anthropologists or pathologists.

**Services:** MUPS indexes dental records and physical characteristics that may aid in the identification process. Dental records of known missing persons and those of unidentified remains submitted by coroners and ME offices are collected and compared against each
other. In concert with the dental records, MUPS collects physical identification components, such as descriptions of the missing, fingerprints and anthropological analysis of unidentified human remains. In addition, descriptions and cross comparison of unique individual attributes, such as tattoos, scars, physical impairments, antimortem injuries, personal items, jewelry, clothing, etc., are all taken into consideration when attempting to identify the missing and unidentified. The information retrieved and entered into the MUPS missing persons database and unidentified human remains database are compared against each other in hopes of a match. Individuals working within MUPS also make inquiries to private and federal level databases to find information that may lead to the location or identification of an individual. MUPS also works with DNA based index, Cal-DNA/MPDD, to increase the probability of identification.

Availability: California and Federal Law Enforcement Agencies

**CAL-DNA: California's Database and Databank Program**

*URL:* http://oag.ca.gov/bfs

*About:* CAL-DNA is a California run index system focusing on the identification of the missing and unidentified. A two-part index system, CAL-DNA sources the missing persons database against the unidentified human remains database. This system is compatible with the FBI's CODIS Index Systems and is designed and used for identification purposes only. CAL-DNA is a blanket term for the combined DNA analysis programs developed and utilized by the California Department of Justice (CADOJ). In 2001, as an expansion of the previously established identification databases, the CADOJ started the Missing Persons DNA Program (MPDP). This system operates very similarly to CODIS, storing DNA profiles into two separate indices: missing persons database and unidentified human remains database, and then cross referencing the two in hopes of an identification. In 2004 California legislators passed Prop 69, "DNA, Fingerprint, Unsolved Crimes and Innocence Protection Act." This Act, combining all efforts of CAL-DNA and California fingerprint databases, enables law enforcement and appropriate legal agencies to access and cross reference
multiple sources of data for the purpose of identifying previously unidentified human remains, missing persons, and criminal offenders. Applying this information to unidentified, undocumented foreign nationals is limited. DNA of unidentified decedents located in California, regardless of presumed nationality, is required to be extracted and added to the state’s DNA index system.

Services: Collects, analyze, and compare DNA samples, and submit DNA to NamUs and CODIS.

Availability: California Legal Agencies

Private

The Doe Network

The Doe Network is a private, volunteer run organization that aims to aid law enforcement in the identification of missing persons and unidentified remains on a global scale. Their mission is "to give the nameless back their names and return the missing back to their families" (doenetwork.org). Their volunteers attempt to accomplish their goals by providing a place for family members to enter information about their missing loved ones and in turn compare information received to active and cold cases. The Doe Network is a private entity, so they are not privy to the same resources law enforcement is, but they do work very closely with Federal, State and local law enforcement. Their information is regularly updated, compared with law enforcement reports, and available to the public online for unbiased access.

Everyone Deserves a Name (EDAN)

"Project EDAN consists of 23 experienced, certified Forensic Artists who volunteer their time and talent to assist law enforcement, medical examiners and coroners with the investigation of unidentified decedents. Project EDAN forensic artists create composite sketches and clay reconstructions of unidentified human remains from skulls and post-mortem photographs" (www.projectedan.us/).
International Resources

Mexico

**SIRLI:** System for the Identification of Remains and Localization of Individuals

**URL:** N/A

*About:* SIRLI is a database designed in the United States by two professors at Baylor University, Waco, Texas. Dr. Lori Baker, a physical anthropologist who concentrates her work in osteology and molecular biology and husband, Dr. Erich Baker, a computer science professor at Baylor University, collaborated to introduce a set of databases specifically designed to aid in the identification of undocumented deceased migrants. The system was composed of two databases, one with postmortem data and the other with antimortem data. These databases are then able to cross reference each other, matching data from one to the other producing possible identifications of unidentified human remains. The antimortem data could be entered by anyone with a missing loved one from anywhere with Internet capabilities. The type of data entered is physical descriptions and unique characteristics. The basic physical characteristics include: age, sex, height, weight, eye color, hair color, etc. The unique characteristics include: past trauma (healed fractures, scars, dental modification, past surgeries), medical conditions, any physical anomaly, dental records, etc. In addition to the physical characteristics, a description of what the missing individual was last seen wearing, any specific items they might have been carrying, or anything else that might link an unidentified decedent to a living record is entered. In addition, SIRLI offers DNA analysis. Individuals are able to submit their DNA, through a "do it yourself" DNA kit provided by Baker's group, to compare to an individual thought to possibly be their missing loved one, or the DNA profile could be stored as part of the comparative collection in hopes of hitting a match. During the time Dr. Baker and Dr. Baker ran SIRLI, they identified over 150 individuals nationwide. SIRLI was handed over to the Mexican Government in 2006 in the hope that the Mexican people would continue to utilize and improve the database. ImageWare Systems, a San Diego based technology company, was awarded the contract to
maintain SIRLI for the Mexican Government. They were hoping to continue the services
SIRLI provided while in the hands of the Baker group, but due to a damaging flood in a
Chicago warehouse, many of the records and documents associated with SIRLI databases
were lost or damaged beyond repair (C. AuBuchon, personal communication, 2008). The
Baker group hoped to reconstruct the database in minimal time, but it has yet to be restored
to its original functioning capacity. Dr. Lori Baker continues to make efforts to identify and
reunite loved ones separated by tragedies suffered while attempting to cross the Mexico/US
borders through "The Reuniting Families" project she and her husband have established.
Reuniting Families is very similar to their original SIRLI database, but focuses a bit more on
positive identification through DNA analysis. The public continues to be able to input data
on a missing loved one and "do it yourself" DNA kits are still available through the project.
Since the creation of SIRLI, many more cross referencing databases focusing on missing and
unidentified migrant populations have been created. In Arizona, the Missing Migrant DNA
Database and the Comite de Familiares de Migrantes Fallecidos y Desparecidos de El
Salvador (COFAMIDE) teamed up with a DNA lab in Pima, Arizona, to cross reference
DNA samples from individual across borders. Since commencement of COFAMIDE in
2006, they have identified 59 individuals. Currently, ImageWare is progressing with the
identification databases, working in Mexico with the cooperation and collaboration of
Mexican and US officials. ImageWare hopes to reinstate the program with increased
resources for identification: integrating biometrics, identification records, web-based
investigations, and allowing for information sharing across borders (M. Alverdi, personal
communication, 2012). Other state, national, and international databases exist and can help
in the identification of deceased unidentified undocumented migrants, but the focus of these
databases is on a national level and heavily centered on DNA profiles as the means of
identification.

Services: (Inactive) Currently ImageWare Systems is working with Bode Technology and the
US and Mexican governments to make this system efficient and effective across nations
(Alverdi, personal communication, 2012).

Availability: When it was active, non restricted access-Political Agencies and Civilians
Bode Technology

URL: http://www.bodetech.com/

About: Bode Technology has recently been selected to create a Mexican identification database that will utilize presumptive and positive identification methods to aid in the identification of deceased migrants (Olavarria, personal communication, 2012). Bode Technology specializes in DNA and identification technology and has assisted in identifying victims of mass disasters, terrorist attacks, accidents, etc. They pride themselves on fast, innovative, and accurate methods of identification (bodetech.com). Identifying and returning migrant decedents, found on either side of the border, is a challenge to US and Mexican agents because when alive, these migrants did not want to be identified by law enforcement. In response, Mexico is creating a database, ideologically comparable to the missing and unidentified persons databases used in the United States. Ideally, people would be able to submit reports and DNA samples to law enforcement via the internet or by traveling to the nearest identification center.

Services: Currently Mexico offers citizens the opportunity to file a missing persons case by going to their local government office. There are many offices throughout Mexico, providing an accessible resource for families of missing migrants. In addition, Mexico does have a DNA program where DNA profiles can be compared with migrants that have been located in Mexico; however, the only location to submit a DNA sample is in Mexico City, which is a long way from home for most family members of fallen migrants (Olavarria, personal communication, 2012). With the technology from Bode Technology, Mexico hopes to provide accessible data and locations for information submission to law enforcement and the general public across borders.

El Salvador

COFAMIDE: Comité de Familiares de Migrantes Fallecidos y Desaparecidos
About: COFAMIDE is a database system that began in 2006 in response to the actions taken by family members of missing migrants in El Salvador. With the collaboration and support of the El Salvadorian people and government, and the Argentine Forensic Anthropology team, a DNA database has been created that utilizes information from international sources, including the US, Mexico, Guatemala and El Salvador. Since the start in 2006, 59 individuals have been positively identified and many more samples have been acquired.

Services: Uses DNA, and Anthropological data to cross-reference bi-national biological information on missing and unidentified persons.

Availability: COFAMIDE volunteers, El Salvador Government
APPENDIX B

UHR
## Unanticipated Discovery of Human Remains (HR)

<table>
<thead>
<tr>
<th>Date:</th>
<th>Name:</th>
<th>Company:</th>
<th>Time of Day:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location:</th>
<th>GPS: UTM/LatLong/other</th>
<th>Complete HR</th>
<th>Incomplete HR</th>
<th>Skeletonized</th>
<th>Fleshed</th>
<th>Partially Skeltonized</th>
</tr>
</thead>
</table>

Brief description of remains* e.g. presence and absence of skull, limbs etc.

*If Skeletonized, refer to available chart for reference

<table>
<thead>
<tr>
<th>Clothing</th>
<th>No Clothing</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Item</td>
<td>Brief Descriptions:</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Shoes</td>
<td></td>
</tr>
<tr>
<td>Shirt</td>
<td></td>
</tr>
<tr>
<td>Pants</td>
<td></td>
</tr>
<tr>
<td>Hat</td>
<td></td>
</tr>
<tr>
<td>Jacket</td>
<td></td>
</tr>
<tr>
<td>Bag/Backpack</td>
<td></td>
</tr>
</tbody>
</table>

**Brief Descriptions:**

- **Shoes:**
- **Shirt:**
- **Pants:**
- **Hat:**
- **Jacket:**
- **Bag/Backpack:**

**Other Items of interest:**
<table>
<thead>
<tr>
<th>Description of location; relative to surroundings: proximity to trees, rocks, roads, structures, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other information, eg: documents near HR, animal activity, anomalies:</td>
</tr>
</tbody>
</table>

<p>| Legal Agency Informed: | Estimated time of Agency arrival: |</p>
<table>
<thead>
<tr>
<th>Informant:</th>
<th>Did Informant stay with the HR until agency arrived? Y/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date and Time Agency was notified:</td>
<td>Time Informant left HR:</td>
</tr>
</tbody>
</table>
APPENDIX C

DIRECTORY
### Directory of Agencies, Networks, and Labs that aid in the Identification and Repatriation of Missing and/or Unidentified Human Remains

<table>
<thead>
<tr>
<th>Organization</th>
<th>Function</th>
<th>Website</th>
<th>Alternative Contact/Info</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SDMEO</strong></td>
<td>San Diego Medical Examiner's Office</td>
<td>Investigates, processes, holds, and maintains jurisdiction over UHR until identification is reached. Also, partially responsible for entering data pertaining to the identification of all decedents including presumed foreign nationals.</td>
<td><a href="http://www.sdcounty.ca.gov/me/">http://www.sdcounty.ca.gov/me/</a></td>
</tr>
<tr>
<td><strong>UNITCH</strong></td>
<td>University of North Texas Center for Human Identification</td>
<td>Process HR* for DNA results. Federally accredited DNA lab; works with government and private agencies. Also performs other tasks related to identification such as Anthropological and dental examination as related to identification purposes. Feeds CODIS</td>
<td><a href="http://www.untchi.org/index.html">www.untchi.org/index.html</a></td>
</tr>
<tr>
<td><strong>MUPS</strong></td>
<td>Missing and Unidentified Persons Unit</td>
<td>California's Missing Persons Unit. Uses presumptive and positive ID methods. Including physical descriptions, Anthropological data, dental records and works with Cal-DNA and NCIC for DNA analysis</td>
<td><a href="http://ag.ca.gov/missing/content/mups.php">ag.ca.gov/missing/content/mups.php</a></td>
</tr>
</tbody>
</table>
NamUS (National Missing and Unidentified Persons System) is a network that uses presumptive and positive methods for identification. Federally established and utilized by Federal, State and Local agencies for DNA analysis as well as Anthropological and Dental analysis and physical descriptions for ID purposes. Also, allows for the general public to enter in data related to a missing person. Additionally, they have developed protocol and forensic professionals to aid in collecting processing evidence related to the ID process. Best resources for the identification of all missing or unidentified.

www.namus.gov

CODIS (Combined DNA Index System) is FBI's DNA database, stores and cross-references data for criminal and missing or unidentified persons. The most widely and cohesively used database in the United States. As part of the National Crime Indexing System, multiple agencies have access to the information and can submit cases as well.

www.fbi.gov/about-us/lab/codis

DNA Exclusive Database Resources

- FBI’s DNA database. stores and cross-references data for criminal and missing or unidentified persons. The most widely and cohesively used database in the United States. As part of the National Crime Indexing System, multiple agencies have access to the information and can submit cases as well.
- Only accessible by law enforcement or Government Agencies. Mainly used for criminal processing, but can be useful if decedent has a criminal record.
- http://www.ncfs.org/NamUs_Best_Practices.Document.07-16-2010.pdf (Packet that describes ideal protocol and methodology for collecting and submitting evidence pertaining to identification efforts)
- Family submission directions: identifyus.org/help/NamUs-DNA_Protocol_for_Collection.pdf

- https://identifyus.org/en (Allows general public to enter info on a missing person)
<table>
<thead>
<tr>
<th><strong>Cal-DNA</strong></th>
<th>California DNA Database (Prop 69)</th>
<th>Calls for convicted criminals and UHR in California to have DNA samples sent to a central location for comparative purposes. California has since made efforts to link all information to the Federal databases.</th>
<th><a href="http://oag.ca.gov/bfs">http://oag.ca.gov/bfs</a></th>
<th>Information is accessible by law enforcement only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-DNA Resources</strong></td>
<td></td>
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<tr>
<td><strong>IDENT</strong></td>
<td>Automated Biometric Identification System</td>
<td>Resource primarily used by Border Patrol and Customs for crime prevention; scans a single fingerprint after apprehension and it is sent info to a centralized location.</td>
<td>Not Applicable; only accessible by Customs and Border Patrol</td>
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<tr>
<td><strong>IAFIS</strong></td>
<td>Integrated Automated Fingerprint Identification System</td>
<td>FBI fingerprint database that scans and stores full prints of all who pass through the US legal system. In addition, the system stores personal information about the person such as biometrics, tattoos, unusual markings etc. Only accessible by law enforcement and Government agencies.</td>
<td><a href="http://www.fbi.gov/about-us/cjis/fingerprints_biometrics/iafis/iafis">http://www.fbi.gov/about-us/cjis/fingerprints_biometrics/iafis/iafis</a></td>
<td>For information regarding connectivity to IAFIS or latent capabilities, contact the CJIS Division at (304) 625-2000. For questions regarding IAFIS processing, call (304) 625-5590.</td>
</tr>
<tr>
<td><strong>US-VISIT</strong></td>
<td>United States Visitor Visa Program</td>
<td>Part of Department of Homeland Security's Visa program. Stores biometric and descriptive information on foreign nationals who enter legally and illegally. Not a preventive resource, but can lend info to authorities who process unidentified deceased migrants</td>
<td><a href="http://www.dhs.gov/us-visit-biometric-identification-services">www.dhs.gov/us-visit-biometric-identification-services</a></td>
<td>N/A; not available to the public</td>
</tr>
<tr>
<td>Doe Network</td>
<td>Doe Network is a private network of people who devote time and resources into matching Doe cases with Missing Persons cases on a national scale.</td>
<td><a href="http://www.doenetwork.org">http://www.doenetwork.org</a></td>
<td>-Index of UHR: <a href="http://www.doenetwork.org/unidindex.html">http://www.doenetwork.org/unidindex.html</a></td>
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<td>EDAN</td>
<td>Everyone Deserves a Name</td>
<td>Network of Forensic professionals that volunteer their time and efforts to create composite sketches and reconstructions of UHR</td>
<td><a href="http://www.projectedan.us">http://www.projectedan.us</a></td>
<td>They work with Forensic professionals and law enforcement in conjunction with UNTCI</td>
</tr>
</tbody>
</table>

*Unidentified Human Remains
**Human Remains