

Technical Note

The Law Enforcement Agency Forensic Anthropologist

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Abstract: Recent scholarship has emphasized professionalization within anthropology specific to forensic anthropology. In these debates, issues of certification, expertise, training, compensation, and job placement have been underscored. As research expands in biological, archaeological, and cultural issues pertinent to forensic anthropological work, the abilities and potential areas of specialization continue to rapidly expand. Yet, in the United States, many medical examiner's offices contract forensic anthropologists or individuals trained in a related field on a part-time basis. Here, this paper draws on existing literature and professional experience to put forth an alternative area of employment specifically for anthropologists – the law enforcement anthropologist. This paper argues for the use of full-time, civilian forensic anthropologists in law enforcement agencies that can collaborate with anthropologists associated with the medical examiner's office. It can be seen that law enforcement agency anthropologist can use anthropological training to increase success in search and recovery operations, securing fragile crime scenes (e.g., fatal fires), processing remains, consider biocultural issues, and assist in the identification process. Having an anthropologist situated within law enforcement not only provides another avenue of professional employment, but streamlines communication between law enforcement and the medical examiner's office, sensitizes law enforcement to the vital contributions of forensic anthropologists, and enhances the identification process.

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Introduction

Forensic-focused anthropologists in the United States are increasingly pressured to pursue board certification due to standards put forth by organizations such as the National Association of Medical Examiners. While career opportunities require a vast majority of anthropologists to obtain graduate level degrees and board certification, in practice, biological anthropologists, anatomists, and bioarchaeologists at all career levels may be called upon to collaborate with law enforcement on domestic casework [1]. Realistically, law enforcement and medical examiners often seek out those broadly trained in biological sciences, and may even overlook those specializing in forensic anthropology. However, those within the subfield of forensic anthropology often have further osteological specialization or extended study in areas such as trauma analysis, cremation, inter-population studies, or skeletal variation [2]. These keen skills can help both within a lab setting (e.g., research settings or the medical examiner's office) and in the field (e.g., search, location, identification and recovery of human remains). Given proper education and training, an anthropologist can fill a unique and underexplored role as a full-time civilian anthropologist for a state or county law enforcement agency.

As an anthropologist working for a law enforcement agency, one can bring a unique and specialized ability to assist in diverse scenarios associated with human remains. Currently, it is common practice that law enforcement agencies work alongside medical examiner's offices when human remains are located. The medical examiner is often alerted only after remains are found or in situations where there is a high probability of remains being found. Even then, it is not universal practice for a medical examiner's office or crime scene response team to send an anthropologist to recover the remains. A full-time, law enforcement agency anthropologist (LEAA), on the other hand, would be able to assist in the background investigations and field work (searching for remains) prior to medical examiner involvement and track casework, locations, and information pertaining to the person of interest, which could be crucial for medical examiner personnel. Anthropological skills in mapping and archival research facilitate this investigative work. Once remains are located, the LEAA can act in tandem with medical examiner personnel (which may or may not include their own anthropologist) to properly document the scene and recover the remains to be sent to the medical examiner's office. Additional assistance

may be provided by aiding the medical examiner with processing and preparing remains for analysis. After analysis by the medical examiner, the LEAA can then work unidentified human remains cases by using anthropological report data provided by the medical examiner's office to find possible matches in missing persons databases or aiding in advanced DNA sampling and case coordination. This position provides a critical bridge between homicide and missing persons investigators within law enforcement and the medical examiner's office, as the LEAA can not only interpret the anthropology report but also apply a biocultural and contextual lens [3, 4, 5, 6]. The knowledge and role of a law enforcement anthropologist can also help expand the field, as even law enforcement agencies without anthropological laboratories can become aware of the skills an anthropologist can offer. In this technical note, we will explore the differences between a contracted medical examiner's office anthropologist (MEOA), which is one of the most common employment structures of practicing forensic anthropologists, versus the responsibilities of a LEAA, and the benefits of having a forensic anthropologist embedded full time within state law enforcement.

Medical Examiner versus Law Enforcement Forensic Anthropologist Duties

Discussing the roles of MEOAs versus the responsibilities of LEAAs, is crucial to bridging the gap between the two agencies and showcasing the benefit of utilizing both in casework. The traditional role of a MEOA varies depending on the office. The duties may also vary depending on if the anthropologist is full time with the medical examiner's office or contracted. Here we focus on the part-time contracted MEOAs whose duties may include scene recovery upon request, processing human remains, analyzing human and non-human remains, radiographic identification, NamUs (National Missing and Unidentified Persons System) information entry, and curation of remains. Whereby forensic anthropologists who work in consulting capacities, payment by a medical examiner's office may be restricted to particular services deemed within the scope of the medical examiner's jurisdiction.

A LEAA, on the other hand, is a full-time position created within a local, state, or federal police organization to act as an on-call resource for law enforcement use. Though the skillset may be similar to a MEOA, the duties of a LEAA can include, but are not limited to, human versus non-human bone identifi-

cation, searching for missing persons and unidentified human remains, tracking and managing forensic genetic genealogy cases, coordination and collection of biometric data on unidentified human remains (both recent and cold cases), assisting in fatal fire recoveries, training for law enforcement on unidentified human remains cases, and Native American repatriation work. A common scenario best illustrates the consequences for law enforcement when an MEOA versus a LEOA is available. It is fairly routine for a law enforcement agency to send a MEOA images of (possible) bones gratis to determine if the material is indeed osseous and, if osseous, if the bones are human. If the MEOA performs other functions, such as other types of laboratory work, there may be a delay in response time. These delays can cause law enforcement to hold a scene that is not an actual crime scene. Holding a scene obviously expends resources such as time, personnel hours, and equipment [7]. A full-time LEAA, however, can provide quick and reliable responses to these inquiries. In other scenarios, this level of accessibility to anthropological expertise can also be particularly vital to active law enforcement search and recovery operations, especially in the early stages where probable location of remains is not known.

Frequently, law enforcement agencies are tasked with searching for unidentified human remains. Citizen reporting, suspect confessions, or law enforcement investigations may lead to searches for missing persons and victims of crime. Often these searches will rely on a team of investigators and human remains detection (HRD) dogs, the latter of which have been reported to have varying reliability based on experience, training, and handling of the dogs and condition of the remains [8]. Anecdotally, the authors have observed cadaver dogs fail to locate nearby dry, skeletonized remains; or fail to locate remains that had been spread over a large area (as the scent had been spread relatively uniformly across a large space). However, forensic anthropologists are trained specifically in search and recovery of human remains in both surface scatter and burials. Directly partnering a LEAA with HRD canines and their handlers allows for not only scent-driven work, but context or visual clues that are visually picked up on or looked for by forensic anthropology experts. This includes, but is not limited to, visible bone fragments, discrepancies in ground vegetation, insect or animal activity, and possible associated artifacts. If, for example, a search ensues, a possible clandestine grave is located, probed and a positive indication from an HRD canine is given, the LEAA is already on scene to assist and test dig the

area to check for grave indications. This can help illuminate an area of interest or exclude the area. This is especially relevant as anthropologists can employ diverse search patterns and evidence-based techniques for different types of crime scenes. For instance, investigations of ground surfaces with leaf litter [9, 10, 11] or fatal fire scenes [12, 13] can draw from developments in anthropological research and practice to have greater success in recovering remains and delimiting the scene which is particularly critical to scene reconstruction, identification, skeletal analysis.

Fatal fire investigations can also benefit from an on-site LEAA. On the crime scene, a LEAA can deploy their knowledge of human remains to search structures, vehicles, burn pits, or other fire-consumed areas. LEAAs bring enhanced skills sifting, identifying, and collecting fragments, thereby minimize loss of evidence. A LEAA can work directly with the fire response teams, even prior to confirmed presence of human remains – a scenario in which it is highly unlikely that a MEOA would be included. It is known that fire suppression techniques can lead to damage, scattering, and modification of thermally altered remains [14, 15]. Whether extinguishment by water, chemicals, or an excavator is utilized, the remains are subject to further damage [14, 16]. LEAA assessments allow for a trained set of eyes to discern the human remains from other burnt materials, as well as carefully towing and sifting of surrounding areas for lost appendages, bone fragments, tissues/musculature, and other elements (i.e., medical implants) with the person(s) in the fire. Training on the recovery of remains from fires also relies on knowledge of anatomical changes as thermal alteration occurs. This includes, but is not limited to, soft tissue changes, muscle contracture, fragmentation, shrinkage of remains, and macroscopic trauma assessments [17]. How to preserve and collect these remains for assessment at medical examiner's offices is crucial, always for obtaining an identification, but especially if there is perceived trauma and/or the manner of death is anything other than natural or accidental.

Breaking this down further, the positioning of the remains, the level of thermal alteration, and overall assessment of the remains on-scene can be instrumental in recovery of the victim. In many cases of thermal alteration, it is noted that individuals curl into pugilistic pose and, after more extensive exposure, limbs tend to 'break' at the joints, and loss of elements begins to occur. The cranial vault itself, being delicate and thinner in

nature with less musculature to protect it, begins to crumble and is one of the first elements lost, in addition to hands and feet. If too much damage is done to the cranium, identification can become increasingly difficult [19]. Stabilizing remains on scene and carefully sifting, excavating, and securing/removing the remains is a specialty of the forensic anthropologist, whose goal is to preserve and protect the remains for assessment and identification purposes. In cases of common house fires, where the gathering of all remains is out of respect for the deceased and the family, this step can sometimes be overlooked. In other cases, such as homicides or suicides where fire is used to obscure trauma, utilizing a forensic anthropologist becomes imperative to preserving skeletal markers and stabilizing perceived trauma prior to body removal due to the fragility of the remains. Having trained personnel to aid law enforcement and crime scene response teams on such excavations and recoveries is a major coup for the MEOA, given the need to preserve the body and its history of trauma for the medical examiner.

During a search, it is also essential to quickly be able to determine if bones found are human or non-human. This is particularly vexing in scenarios where there is an abundance of osseous material or a plethora of bone “imposters,” (e.g., at a fatal fire scene). For example, landfill searches occur perhaps more frequently than one would imagine [21] and flood law enforcement agencies with bone that has to be confirmed as human or not. Presuming remains or a possible grave are located, the LEAA has the ability to assess the scene, work on collection and documentation with crime scene response personnel, and test dig the area (in cases of clandestine graves). At this point, the LEAA can call in or turn over the information to the medical examiner's office for further assistance and directly work with the medical examiner and their anthropology personnel. Rather than having a consulting anthropologist working from death investigators' or law enforcement reports or arriving at the scene after processing has begun, an LEAA can be on-scene from the start to recognize relevant data, preserve it, document it, and debrief the MEOA. Overall this allows for a more complete collection of remains and documentation of an area of interest from search, to location, and through recovery.

Increasing Demand for Anthropology Skills in Law Enforcement Agencies

As discussed above, there is a wide array of opportunities for anthropological skills and training to be used regularly in law enforcement agencies. In particular, investigation into unidentified human remains can be facilitated by the presence of a LEAA. Identification work falls under the purviews of law enforcement investigators, medical examiner death investigators, anthropologists, and others, depending on state or local policies. Not only does a LEAA assist in consolidating these efforts, but also is able to pull information and scour records through an anthropological lens that understands socio-historical contexts, identity politics, kinship, and genealogy. An anthropological investigative approach assists law enforcement personnel in narrowing down candidates for their unidentified human remains cases by drawing on various subfields of anthropology (e.g., biological, archaeological, and cultural) to assess missing persons and unidentified human remains cases [22, 23, 24, 25, 26]. For instance, in some labs anthropologists may examine artifacts, personal effects, or tattoos and conduct social media or other inquiries to narrow down possible identifications. However, a MEOAs position does not necessarily allow access to databases for possible identifications from missing persons lists, as a LEAA's might. This is particularly challenging for use of NamUs database, in which access has had tighter restrictions put in place due to misuse of access by researchers.

Coming to the forefront of investigations, presently, forensic genetic genealogy (FGG), or investigative genetic genealogy, offers law enforcement a new avenue of research to identify a suspect or decedent. FGG draws on the diverse types of knowledge in which anthropologists specialize, such as ability to find and interpret public records and archives, to interpret familial relations and marriage patterns, and to comprehend genetics and DNA [27, 28]. FGG utilizes DNA principles and combines them with genealogical research to trace, track, and locate family lines tied together by DNA [29, 30]. Populations today are fascinated with learning about family origin, development, and genealogical ancestral lines, which makes companies such as Ancestry.com, MyHeritage, 23&Me, and FamilyTree DNA popular [31]. These companies take saliva samples from customers and process the DNA, which then gets compiled into each respective database. In doing so, family relationships can be seen from the submitted DNA samples. People, including LEAAs, are able to build out family trees due to the large volume of submitted samples [32].

In many instances participants must opt-in to having the DNA used for law enforcement purposes to help identify potential family ties to unidentified human remains, or, as brought to light by the Golden State Killer case, use family DNA to track suspects [33]. Other sites automatically opt participants in for law enforcement use, making users opt-out in their settings if they wish to not be included in these types of cases.

A law enforcement sample is placed into the budding family trees to identify familial relationships. These family trees and relationships can then be built out by a LEAA using traditional genealogical principles and archival research, which include, but are not limited to, birth, marriage, and death records; census records; military enlistment records; and other public records (such as phone and address directories). Once the family member(s) or person of interest is located, a DNA sample is taken voluntarily or by means of a search warrant (case dependent) and put into the combined DNA indexing system (CODIS) for comparison to the original collected unknown person specimen. In cases of unidentified human remains, the medical examiner must review the DNA report and approve the identification.

Finally, beyond the ability to specialize in or assist with FGG, a LEAA would be particularly suited to assist law enforcement with cold cases. Outdated anthropological reports may be vague or inaccurate as anthropological methods have advanced over the past few decades. LEAAs could recognize when information from the anthropological report has been misinterpreted or is outdated. The LEAA may be able to provide additional investigative leads by synthesizing any anthropological results with police reports, autopsy reports, crime scene photographs, and any other available information contained in a case record.

Along those lines, recent literatures in biological anthropology have questioned if and how forensic anthropological methods are biased or marginalizing and how anthropological work may exacerbate or lay the foundation for biases in missing persons cases [34, 35, 36]. These debates merit the questions, do biases and stigma of the missing impact the will or ability to solve unidentified human remains cases? How many samples of human remains across the United States remain unidentified because of stigmas or negative associations with lifestyle choices? One of the greatest strengths of NamUs, an online database created for storing information on missing persons, unidentified human remains, and unclaimed human remains cases, is the ability for the public to submit a missing persons

case, with the understanding a local law enforcement agency will vet the case. This allows friends and families of the missing to report a case without first going to law enforcement – a crucial factor in missing persons cases where families may feel stigmas or embarrassment due to the missing person's participation in a high-risk lifestyle, or issues with addiction. If we consider sociocultural variances in the reporting and investigation of missing persons, potential implicit biases of medical examiner or law enforcement personnel, and prioritization of missing persons cases (e.g., non-routine missing persons versus habitual drug users), anthropological analyses could provide insight into these public safety and public health issues. For example, the first author points out from experience in law enforcement that some family members of known homeless people do indeed report them as missing; however, the actual amount of homeless missing persons reports is lacking in comparison to instances such as juvenile runaways, voluntary missing persons, and involuntary endangered missing persons.

Similarly, anthropological forensics has been calling attention to public health and human rights data that can be gathered through documentation of structural violence (i.e., lack of access to resources) or structural vulnerability seen in casework [37, 3, 4, 6, 39, 40]. Theoretically, the LEAA would be in a position to gather statewide data on access to resources such as housing or medical care and health status of remains that experience delayed discovery (and in turn, become anthropology cases). When missing persons are located deceased, be it identified or tentatively unidentifiable, tracking biological/skeletal variation amongst remains and correlating them to location would require location/population studies to draw conclusions. These reports could be directly tied to the aforementioned public health and public safety studies, perhaps increasing the efficiency at locating missing persons or more readily identifying human remains. For the latter, one would consider the possibility of anthropologically gleaned information from the scene and remains assessment to complement missing persons report information. For example, if cribra orbitalia or any nutritional deficiency is observed, the LEAA can contextualize this finding across populations and related stressors or food access when working on identifications [41, 42]. The LEAA could become a regional resource for asking questions such as: What populations are most likely to be impacted by this nutritional deficiency? If we see it predominantly in a specific population or societal group, how can we narrow down who the unidentified remains may be?

The duality and wealth of knowledge, both socio-culturally and biologically, that an anthropologist can add to missing persons and unidentified human remains case assessment is vast.

Utilizing advanced skeletal information, such as skeletally manifested pathologies, or even isotope analysis of remains, can be cumbersome to understand for those not specialized in those subfields. Without a finite understanding of skeletal manifestations and what those manifestations mean for an investigation, the information is rather useless. For law enforcement to take on this information and utilize the knowledge and capabilities of an anthropologist by allowing them to sort through the “additional” skeletal, scene, and artifact information, perhaps a more in-depth assessment of unidentified human remains and missing persons cases can occur.

Finally, a LEAA, or collaborating MEOA can use anthropological training to look at systemic logistical issues within the medicolegal system that can hinder the identification process. For instance, when it comes to identifications, NamUs is a database that is routinely used by some law enforcement and medical examiner personnel to track, document, and compare missing persons and unidentified human remains cases [3]. There are both public and professional interfaces of the database. Per the NamUs website [43], there is state legislation in thirteen of the fifty US States requiring the use of NamUs. One of the serious limitations of NamUs is its lack of consistent use across the United States. Utilization of NamUs by law enforcement and medical examiner personnel is a quick comparative route to search cases not just within states, but between states. Could more cases be linked if more cases were entered? What does this mean for research and data spread on social vulnerability and demographics of those missing? are questions to be asked as the use of NamUs becomes more widespread. Using an anthropologist to dive deeper into these questions, both within law enforcement offices and medical examiner's offices, could provide more insight into the questions and help move cases along.

Moving Forward and Challenges

There are abundant uses for a forensic anthropologist within the law enforcement community that can complement the work of paid MEOAs including, but not limited to, rapid response time for human/non-human remains determinations, search

and recovery for missing persons and identification of human remains, collaboration with fire investigators, identification of human remains, biometric data collection, and forensic genetic genealogy investigation. Additional contributions beyond the scope of this paper include familiarity with Native American Graves Protection and Repatriation Act (NAGPRA) procedures and tribal relationships that can be maintained by the LEAA, isotope testing, reporting of structural vulnerability data, and other anthropological training. However, complications for developing LEAA positions can arise. For instance, there needs to be clear jurisdictional procedures between the MEOA and LEAA. Searching, identifying, testing, and working a scene under the assumption of possible human remains, prior to proof of remains, falls under the jurisdiction of law enforcement. Once remains are located though, working alongside and sometimes under the guidance of the medical examiner is necessary. The scene, as held by law enforcement, must be processed according to crime lab protocols; the body must be processed according to the medical examiner protocols and standards. Bridging this gap to ensure all parties are placated can be tricky if roles are not well-defined and understood.

Additionally, there may be variation between medical examiners in frequency and level of communication, what falls under the purview of paid MEOA work, who stores and secures anthropological cases, use of additional support members by an MEOA, which anthropologists have access to NamUs, or if death investigators assist in search and recovery. Factors such as these vary within Michigan. In theory, information from law enforcement and medical examiners should be streamlined with both having one goal: to identify the decedent. Though the medical examiner's office and it's team (i.e., forensic anthropologist, forensic odontologist, death investigator) finalize an identification, law enforcement routinely provide a tentative identification on the decedent via investigatory work. However, in Michigan, the majority of the contracted MEOAs do not proactively offer osteobiographical reports for unidentified human remains to the LEAA unless specifically requested. In contrast, the lead investigator routinely receives a copy upon completion of the report. This can slow the process of identification. Information sharing only works when agencies work together cooperatively. It is recommended that anthropological reports be given to both the investigator and the LEAA to enhance search capabilities and streamline the work done on the law enforcement side of case investigation. Any possible candidates for identification can