

Dawnie Wolfe Steadman,¹ Ph.D. and William D. Haglund,² Ph.D.

The Scope of Anthropological Contributions to Human Rights Investigations*

ABSTRACT: This paper examines the participation of anthropologists in international human rights investigations between 1990 and 1999 by surveying four of the most active organizations, including the Argentine Forensic Anthropology Team, the Guatemalan Forensic Anthropology Foundation, Physicians for Human Rights and the U.N.-sponsored International Criminal Tribunal for the former Yugoslavia. The education level, sex, nationality and primary role of the anthropological members of each team are quantified, as are the types of projects in which they contributed. The results show that 134 anthropologists from 22 nations investigated nearly 1300 sites in 33 countries during the study period. While involvement is not limited to those with advanced degrees and few obstacles are placed before anthropologists who wish to participate, full-time service within these organizations is rare and those interested in a career in forensic anthropology and human rights should understand the employment limitations.

KEYWORDS: forensic science, forensic anthropology, human rights

Nearly 250 armed conflicts have raged since the end of World War II, resulting in approximately 170 million casualties (1). At least 20 wars were fought in the year 2000 alone (2). Although international resolutions have banned wartime atrocities such as genocide, rape and torture, such violent incidents against non-combatants continue to occur, and recent human rights atrocities have included widespread slaughter of civilians (1). Currently, international attention focuses on limiting impunity of those who commit atrocities by imposing justice without borders—international human rights doctrines that demand individual accountability. Following the development of the U.N. Charter in 1945, the United Nations quickly drafted the London Charter, which established the Nuremberg and Tokyo war crimes trials that ultimately recognized “crimes against humanity.” Another important step was taken in 1948 with the Declaration of Human Rights and the Genocide Convention, as well as the first Geneva conventions a year later. With the addition of new protocols in 1977, “crimes against humanity” now apply to peace- and war-time conflicts as well as to combatants and non-combatants alike. These declarations ultimately aided the Security Council of the United Nations in founding the *ad hoc* International Criminal Tribunals in the former Yugoslavia and Rwanda in 1993 and 1994, respectively. The Rome Statute of 1998 established a permanent International Criminal Court (ICC) to impugn those who fail to uphold the international conventions (1,3,4). The most recent judicial creation by the UN has been the Special Court of Sierra Leone, established in 2002 by special agreement between the government of Sierra Leone and special representative of the UN Secretary General (5).

As national and international courts seek to prosecute individuals for atrocities, the need for the objective collection and evaluation of physical evidence by forensic scientists has never been greater.

The majority of material data consist of interments and, due to inevitable delays in scientifically accessing the graves, the remains are often skeletonized. Given the nature of the evidence, forensic anthropologists and archaeologists have been thrust to the forefront of international scientific investigations owing to their training in grave recognition, exhumations and human identification.

The first utilization of international forensic anthropology experts into human rights investigations began in 1984 when an international delegation of forensic scientists sponsored by the American Association for the Advancement of Science (AAAS) responded to Argentina’s request for expert assistance in exhuming and identifying thousands of *Desaparecidos*—individuals who “disappeared” during the Junta military regime between 1976 and 1983 (6,7). The subsequent founding of the Argentine Forensic Anthropology Team (EAAF), under the leadership and tutelage of Dr. Clyde Snow, was one legacy of their work (8,9). Democratization of the region and the teams’ success in presenting forensic evidence to the courts and providing personal identifications for families sparked the development of a number of anthropological teams in Latin America and the EAAF serves as a model for international forensic-based human rights organizations. Now, nearly two decades after the initial Argentine inquiry, *ad hoc* national and other forensic-based teams have conducted international investigations, most enlisting anthropological expertise. There has been no attempt, however, to synthesize the work product of these organizations or to present an objective perspective of the anthropological contribution to this rapidly expanding field.

The purpose of the present study is to provide an understanding of the extent of forensic anthropological and archaeological involvement in human rights projects in the 1990’s, when international work began on an expanded scale, by surveying four organizations. Three are non-governmental organizations (NGOs): the Argentine Forensic Anthropology Team (EAAF), the Guatemalan Forensic Anthropology Foundation (FAFG), and Physicians for Human Rights (PHR). The International Criminal Tribunal for the former Yugoslavia (ICTY) was established by the United Nations. Though these teams are by no means the only forensic-based human rights organizations, they were most likely to be involved in

¹ Binghamton University, SUNY, Department of Anthropology, PO Box 6000 Binghamton, NY.

² International Forensic Program, Physicians for Human Rights, Seattle, WA.

* Presented at the 53rd annual meeting of the American Academy of Forensic Sciences in Seattle, WA.

Received 21 May 2004; and in revised form 2 Sept. 2004; accepted 6 Sept. 2004; published 8 Dec. 2004.

the larger-scale projects and fielded the greatest number of anthropologists between 1990 and 1999.

By surveying these four organizations, we can quantify the majority of the anthropologists and archaeologists who participated in human rights work, the roles they performed on the projects, the number of countries to which they were deployed and the scope of their work product (e.g. graves exhumed). This information is significant for a number of reasons. First, forensic anthropologists assist in the documentation of past atrocities by quantifying the casualties and evaluating the circumstances of their deaths. By synthesizing the frequency, location and demographic profile of victims across the continents, forensic anthropologists are creating a new, objective perspective on some of the most notorious, as well as forgotten, events of the 20th century. Second, anthropology is most productive when set within a multidisciplinary context, and human rights work represents a novel collaborative effort to which anthropologists can contribute. Further, the potential to make significant contributions to victims' families and the international justice system continues to attract the interest of many students to this new area of anthropology. With this burgeoning popularity, students will likely seek academic programs that incorporate practical training in skeletal biology, forensic anthropology and archaeology, forensic science, international law, and criminalistics. However, in addition to appropriate training, those wishing to pursue forensic anthropological human rights endeavors must also have a realistic notion of the nature of employment opportunities in the field. Finally, continued involvement in global investigations has necessitated new research foci, including the study of unique taphonomic variables of mass graves (10,11) and the development of new demographic standards for local populations (12–15).

Surveyed Human Rights Organizations

Officially founded in 1986, the Argentine Forensic Anthropology Team has maintained a constant investigative presence in Argentina but has also established an extensive global reputation by responding to requests from foreign NGO's, Truth Commissions and the United Nations. Their goals include the use of forensic techniques to document human rights abuses, to provide physical evidence to the courts, to assist in training new teams in other countries, to educate the medicolegal system in other countries about the application of forensic anthropology to human rights investigations, and to provide an accurate historical representation of the recent past (8).

In 1992, the Argentine Team became a model for the Guatemalan Forensic Anthropology Team (EAFG), who received additional training from Clyde Snow, Karen Burns and other members of an AAAS delegation to Guatemala. In January 1997, the Guatemalan team divided into two organizations, the Guatemalan Forensic Anthropology Foundation (FAFG) and the forensic anthropology team under the Office of the Archbishop of Guatemala. A split occurred in the Office of the Archbishop team in May 1998 with the founding of the Centre of Forensic Analysis (CAFCA). Though all three teams are currently in operation and focus primarily on the investigation of domestic atrocities, this survey only includes the efforts of the FAFG. The Argentine and Guatemalan teams are largely supported by non-government human rights organizations, private and public foundations, and private donations.

The ICTY was established by the U.N. Security Council Resolution 827 in 1993 and maintains four objectives: "to bring to justice persons allegedly responsible for serious violations of international humanitarian law, to render justice to the victims, to deter further crimes and to contribute to the restoration of peace by promoting

reconciliation in the former Yugoslavia (16)." Based in The Hague, Netherlands, ICTY oversees the trials of accused defendants and utilizes forensic evidence of atrocities, which typically involves the detection and exhumation of mass graves. ICTY deployed its own forensic teams between 1997 and 2001, with significant contribution from anthropologists and archaeologists.

In 1986, the Boston-based NGO, Physicians for Human Rights (PHR) was formed. PHR is recognized for using medical and scientific methods to investigate, expose and cease violations of human rights worldwide. PHR supports institutions to hold perpetrators of human rights abuses accountable for their actions. PHR's early forensic investigations, led by PHR consultant and later Executive Director Eric Stover (1992–1994) and forensic anthropologist Clyde Snow, focused on uncovering atrocities in Guatemala, Honduras, Brazil, Chiapas, Mexico and Iraqi Kurdistan. PHR's International Forensic Program was formally established in 1995 under the direction of forensic pathologist Robert Kirschner and, since 1998, has been steered by co-author WDH.

While PHR worked initially in Croatia under the auspices of the UN Commission of Experts in 1992 and 1993 prior to the development of the ICTY, PHR continued these efforts under contract to ICTY in 1996 (17). PHR's Bosnia Project had four subprojects that involved collection of antemortem and postmortem data to identify thousands of bodies, providing supplies, resources and training to local Bosnian staff, and a monitoring project that provided archaeological and anthropological assistance and expertise to Bosnian professionals. The ICTR also employed PHR forensic scientists in its investigations of the genocide in Rwanda, although forensic investigations were suspended after 1996, due in part to security issues.

Materials and Methods

Data were gathered from the annual, semi-annual and project reports for each organization for years 1990, or the year of inception, whichever was first, until 1999. The following information was collected for each organization: 1) number of projects administered each year; 2) country of projects; 3) primary roles of the anthropologists; 4) education level and nationality of the anthropologists; 5) number of full-time anthropologists employed annually, and 6) number of sites, including mass graves, surveyed and/or excavated.

Currently there are no standard reporting measures for investigative teams and the format, content and level of detail varies significantly between organizations and over time. The following terms are carefully defined to insure that data between organizations are directly comparable. "Forensic anthropologists" are biological anthropologists or archaeologists who focus on forensics. This term also includes archaeologists who specialize in biological anthropology under other educational systems, such as the U.K. A "project" is a clearly defined plan that is designed, administered and implemented by an organization to conduct archaeological surveys (including test pits and surface collection), skeletal analyses and/or excavations at one or more burial or suspected burial sites. "Burial sites" are categorized as mass and single graves. For the purposes of this study, "mass graves" are defined contextually as those in which two or more individuals sharing a common trait (e.g. manner of death) are placed within a grave or within individual graves deposited approximately simultaneously (18). For instance, in El Mozote, El Salvador, surviving villagers returned to bury victims in both common and individual graves, yet the individual graves were spatially proximate and clearly represent one concerted burial (and exhumation) event (19,20). ICTY and PHR also routinely

investigate mass deaths that were not followed by burial. Surface scatter of the bones of multiple individuals are particularly common in Bosnia and Rwanda. Because multiple murder victims are involved, we consider such sites of surface scatters as mass graves.

PHR and ICTY often administered investigations that drew upon members from the Argentine and/or Guatemalan Forensic Anthropology Teams. These regional teams considered such cases as “projects” as they sent their personnel to assist even though they were not the primary administrator. For the purposes of this study, such endeavors will be considered “joint projects” in the following analyses. A “report” refers to written documentation of the project objectives, personnel involved, activities and investigative conclusions. Interim reports are included only if final reports have not yet been filed.

The “primary role” of the anthropological expert is difficult to classify. Though anthropologists perform many functions during human rights investigations (21,22), most have a defining, or primary, responsibility. In some cases it was necessary to divide their activities into the approximate time spent in each role and choose that role with the highest percentage. The primary roles include:

- Exhumations; includes location, excavation, mapping and recovery of buried and surface scattered human remains and associated evidence.
- Administration; persons responsible for the daily mechanics of the project, including the organization of time, money and personnel.
- Monitoring and consulting; includes overseeing the forensic efforts of local personnel and/or establishing a future protocol of investigations.
- Skeletal analysis for the purpose of personal identification and/or documentation of trauma.
- Testifying in court and/or providing legal advice concerning the presentation of anthropological evidence in court.
- Seminar presentations and training sessions for local forensic scientists and legal personnel to teach forensic techniques or discuss the application of forensic anthropology to local human rights issues.
- Assisting the pathologist; primarily concerns investigations in the former Yugoslavia in which a great amount of soft tissue is present.
- Database development and management; typically this includes archaeological information, the results of skeletal analyses and antemortem/postmortem identification databases.
- Collection of antemortem data; includes interviews with families and compilation of records required for identification purposes.
- Logistics and assessment; refers to initial trips to establish contacts, obtain appropriate documentation and permits, scout facilities and housing or simply determine if a particular investigation is feasible from a political and practical standpoint.
- Statistical analysis; to assess size of grave, geographic patterning of graves across a landscape, identifications, or demographic information.

Finally, we determined the number of full-time anthropologists employed annually by each organization. “Full-time” is defined as employment over 12 consecutive months.

Annual reports were available for EAAF from 1991–1999 (23–29), and for PHR from 1993–1999 (30–34). Additional PHR site and projects reports were also consulted (35–42, personal communication). The FAFG reports reviewed include 1992–1995 (43–45) and 1997–1998 (46), though data were also gleaned from the FAFG

website (47) and personal communication with team members. Due to difficulties in amassing the data required for this study, the results presented in this paper concerning the FAFG work is considered preliminary and forthcoming articles by team members will provide a more complete accounting of their activities to date. The ICTY released data on anthropological involvement from 1997–2000 to the first author and additional information was found in the U.N. 1996–1999 Annual Reports (48).

Results

The results indicate that 134 anthropologists from 22 different countries participated in human rights investigations administered between 1990 and 1999 by the four organizations surveyed. Of the 131 anthropologists for whom sex is known, just over half (55%) are male. In addition, anthropologists participate at all stages of education and training. Education levels are known for 116 of the 134 anthropologists, and only 27% had a PhD by the time of their most recent project (Fig. 1). This result reflects, in part, differential education among many U.S. and Latin American anthropologists and archaeologists, the latter of whom gain tremendous field experience very early in their careers but may not attain a higher degree. It must be noted that criteria for team membership in ICTY and PHR are often based on experience. Latin American anthropologists who may lack higher degrees often have vastly more field experience with exhumations, especially mass graves, than the majority of individuals from the U.S. or U.K. with advanced degrees. The large number of individuals with a high school education signifies the contribution of college students who had not yet earned their baccalaureate or equivalent.

Most anthropologists involved in human rights investigations during the 1990’s are from the United States (45%), followed by Guatemala (15%), the United Kingdom (15%), Canada (13%) and Argentina (12%). Figure 2 demonstrates the breakdown of anthropologist nationality by geographic area. Grouped regionally, most anthropologists and archaeologists hail from South and Central American countries, followed by the United States and Europe.

While anthropologists perform a number of different and far-ranging tasks during their deployments, emphasis remains on traditional forensic anthropological roles – excavation and skeletal

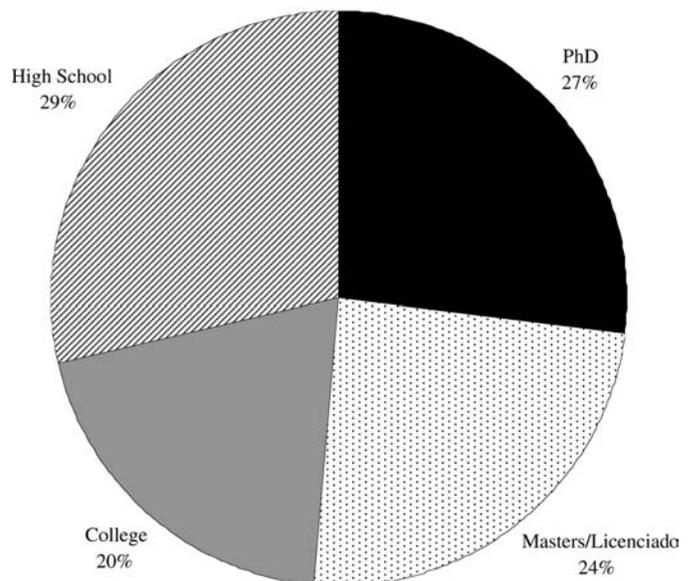


FIG. 1—Education level of anthropologists.

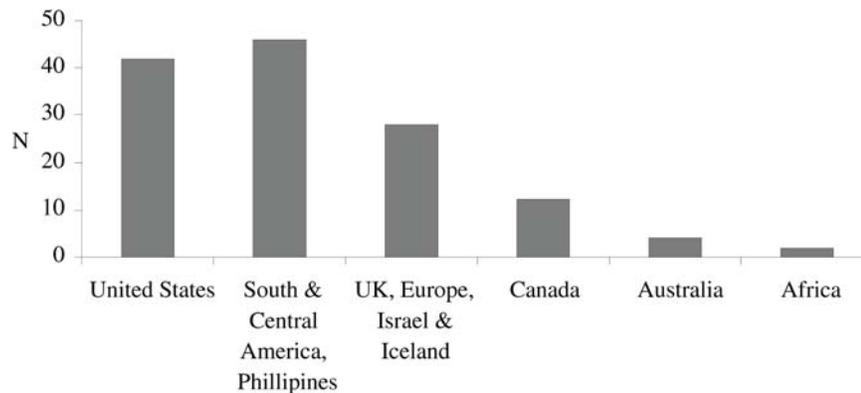


FIG. 2—Nationality of anthropologists by geographic region.

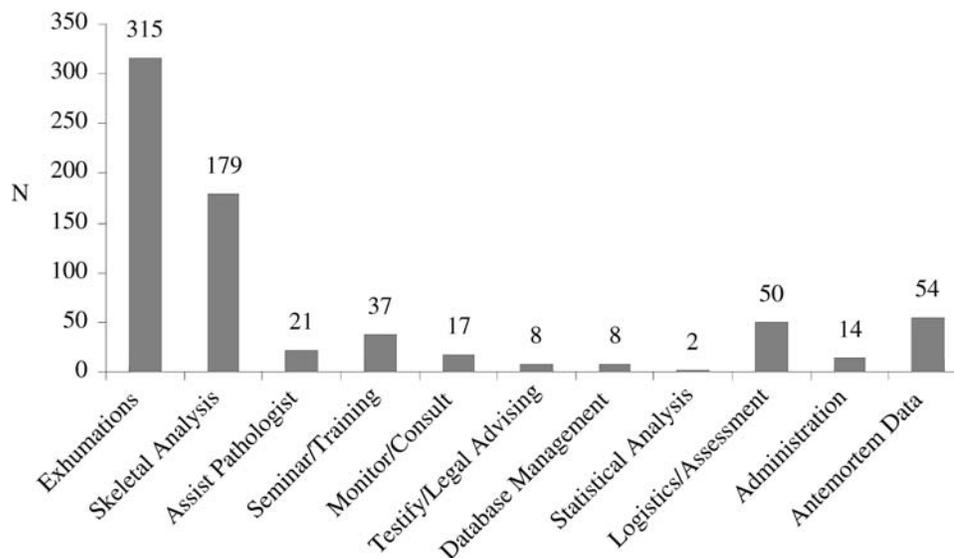


FIG. 3—Primary roles of anthropologists deployed in human rights investigations.

TABLE 1—Summary of project and site activity by organization for the period 1990 and 1999.

| Team | Projects* | Joint Projects† | Countries | Sites of Surveys, Exhumations or Skeletal Analyses (Single and Mass) | Mass Grave Sites Excavated‡ |
|------------------|-----------|-----------------|-----------|--|-----------------------------|
| EAAF | 55 | 11 | 24 | 102 | 45 |
| FAFG | 52 | 9 | 9 | 66 | 49 |
| ICTY (1997–1999) | 7 | 0 | 4 | 47 | 24 |
| PHR | 31 | 0 | 13 | 1068 | 61 |
| Totals | 145 | 18 | 50 | 1283 | 179 |

* Projects are those that include site surveys and/or archaeological investigation and/or skeletal analyses (excludes projects dedicated to training or presentation of conference papers).

† Personnel for a project administered by a different organization.

‡ Mass grave is defined as two or more individuals within a grave or suspected to be within a grave, individual interments that were dug simultaneously that reflect one burial event, and surface scatter of multiple individuals.

analysis (Fig. 3). Forensic anthropologists are routinely trained in body recovery and personal identification for local casework. However, our results show that because anthropologists are increasingly assuming a leadership position in multidisciplinary human rights teams, the role of logistics, assessment and historical research is becoming more important as they must determine the feasibility, cost and materials required for each project. Another crucial role is the training of local forensic scientists in the field and in the lab, as well as educating governmental officials on the procedures, methods and benefits of anthropological investigations. EAAF and

PHR anthropologists are particularly keen on perpetuating this role in international investigations.

Together, the four organizations surveyed deployed anthropologists on approximately 145 projects to 33 countries around the globe (Table 1). Many anthropologists participated in more than one project during the decade (most EAAF and FAFG anthropologists are involved in multiple projects each year). The 134 anthropologists and archaeologists identified in this study were deployed to at least 1283 sites during the 1990's. This is likely an underestimate given the unaccounted number of domestic projects in

TABLE 2—Number of anthropologists fielded by organization (1990–1999).

| Team | N Anthropologists Fielded | N Nationalities Represented by Fielded Anthropologists | N Anthropologists Employed Full-Time |
|---------------------|---------------------------|--|--------------------------------------|
| EAAF | 20 | 6 | 8–11 |
| FAFG | 20 | 6 | 6–12 |
| ICTY (1997–1999) | 53 | 11 | 1–2 |
| PHR | 62 | 18 | 1 |

Argentina and the number of sites surveyed but as yet unexcavated in the Balkans. While we report a minimum of 179 mass graves exhumed, this number is also problematic as some reports do not indicate the nature of the site (single or mass graves or surface scatter) and/or the number of interments in each grave. For instance, PHR teams assisted in the exhumation of over 3500 individuals from 819 sites in Bosnia between 1997 and 1999, but it is unclear how many are mass graves because the site reports are currently unavailable to the authors. Thus, we included in this category only the sites known to be mass graves that satisfy our definition, which may under represent the total number of mass graves investigated by the organizations surveyed.

Table 1 presents the type and number of projects administered by each team and Table 2 quantifies the number of anthropologists and archaeologists fielded by the organizations. The Argentine Team participated in at least 55 excavation and/or survey projects as well as 12 training projects in 24 different countries. These data do not accurately represent the number of domestic investigations as the cases described in the reports are only those that are solved or pending immediate solutions. In the 1990's the majority of EAAF projects were international in nature. The Argentine Team is committed to working in the international community to train forensic and legal personnel in forensic anthropological techniques and conduct investigations at the invitation of foreign governments and local NGO's. An additional 11 EAAF projects are considered joint projects in that their members participated in projects administered by the FAFG, ICTY or PHR organizations. During the study period, EAAF has fielded 20 anthropologists from six different countries and supported between eight and eleven full-time anthropologists at any one time. EAAF has investigated or surveyed over 100 sites, including at least 45 mass graves.

The FAFG has conducted at least 52 projects involving 66 sites (disregarding joint projects), the majority of which ($N = 60$) have been conducted within Guatemala, reflecting their deep commitment to domestic human rights issues. Guatemalan team members have also been involved in nine projects administered by PHR, ICTY and EAAF. FAFG employed up to a dozen full-time anthropologists annually but have fielded at least 20 anthropologists from six countries. Their numbers are increasing greatly as by 2003 the FAFG employed approximately 60 anthropologists.

ICTY sponsored seven clearly defined and independent projects in Bosnia, Croatia, Serbia and Kosovo from 1997 through 1999, each involving multiple sites. ICTY maintained a nearly constant forensic presence in the region and fielded anthropologists from around the globe. Between 1997 and 1999, 53 anthropologists from 11 countries worked at over 47 sites under the auspices of ICTY in the former Yugoslavia. These sites are predominately mass graves, including cave sites (49) and mass surface scatters of human remains, such as that found at Kravica (50). ICTY employed one or two full-time anthropologists during this time.

Physicians for Human Rights has participated in at least 31 projects, though this number greatly under represents their activity in the former Yugoslavia. From 1996 to 2000, PHR maintained a constant presence in the Balkans by rotating forensic scientists through countless sites and tasks, which do not begin and end as "projects," according to our definition. As PHR is based in Boston, all of their investigations involving anthropologists to date are international in scope. PHR has excavated or surveyed over 1000 sites in 13 countries. Although PHR employed only one full-time anthropologist annually, this organization has fielded over 60 anthropologists from 18 countries.

The increase in anthropological international involvement during the last half of the 1990's is a direct result of the impact of the Balkans war and the establishment of the War Crimes Tribunal on forensic science (Fig. 4). PHR and ICTY have worked together and independently in this region and each has drawn upon anthropologists from the Argentine and Guatemalan teams, as well as from around the world. Outreach to African countries by EAAF and PHR, including Ethiopia, Rwanda, South Africa, Congo and Zimbabwe, have received less political and media attention yet the promise of accountability and justice is no less integral to the personal and national healing process.

Discussion

In the past two decades the global community has come to expect a rapid response to atrocities, yet scientific investigations are often stalled for months or years due to the lack of security and resources or an unstable political climate. In the interim, many sites are disturbed or destroyed by well-meaning non-professionals wishing to locate missing persons and to expose atrocities³, by perpetrators moving victims and graves (11), and by the vagaries of nature, all of which necessitate forensic anthropological involvement. However, forensic anthropologists and archaeologists trained to locate, recover and identify buried and scattered human remains should also be prepared to develop roles beyond those normally expected in local casework as they expand their expertise into the international arena. Logistical assessment, forensic pathological assistance, project administration, international testimony and database management are emerging responsibilities of the forensic anthropologist in human rights work. Extensive review of historical documents, including judiciary, police, hospital, cemetery and witness reports as well as previous reports submitted by local and national bodies is also required prior to initiating a project (8). Broad training in the social and physical sciences is crucial to prepare for the evolving roles in human rights investigations.

By highlighting only projects involving exhumations and/or skeletal analyses, one important contribution of these organizations is in danger of being overlooked. Members of EAAF, FAFG and PHR all present papers and conduct seminars in a number of countries on the importance and results of forensic-based human rights investigations. For instance, EAAF conducted at least 22 seminars and training projects on the application of forensic anthropology and archaeology to domestic problems in a minimum of 15 countries during the study period. In some of those countries, such as Guatemala and Chile, this assistance has led to the formal organization of forensic teams.

This study has demonstrated that the vast majority of anthropologists and archaeologists active in human rights investigations in the

³ Exhumation by locals in Iraq, after the fall of the Saddam Hussein Regime, has been the most recent example.

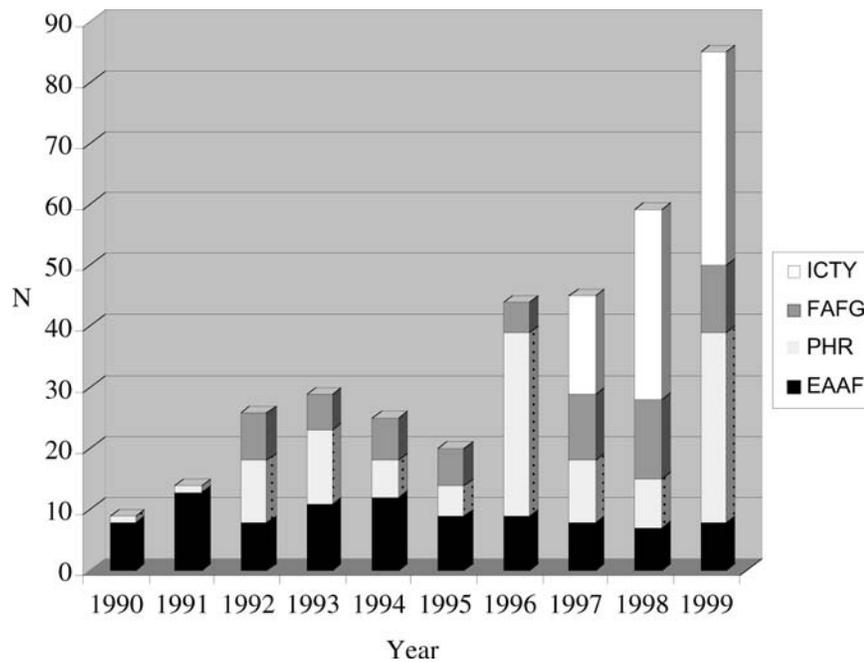


FIG. 4—Number of anthropologists fielded annually by organization (1990–1999).

1990's do not have doctorates. In many ways this reflects differential access to higher education opportunities and programs outside of the United States. It also indicates a unique aspect of forensic anthropology and archaeology in that, unlike forensic pathology, an advanced degree and certification are not required to practice the discipline. Selection criteria for team membership appear to focus on experience and internationalization rather than on advanced degrees or board certification, the latter of which is only applicable to North American forensic anthropologists. All four organizations surveyed in this study field a large number of graduate and undergraduate students from Europe, the U.K. and the U.S. as well as a great number of experienced Latin American anthropologists.

Clearly the number of full-time anthropologists, defined as employment for 12 consecutive months or longer, is quite low. This demonstrates important characteristics of both human rights and forensic anthropology. As most practicing forensic anthropologists in the United States are employed in academic settings and project salaries are highly variable, few professional anthropologists can professionally or financially afford to accept yearlong projects. Similarly, the ephemeral nature of human rights investigations and the limited funding available restricts the number of anthropologists who can be employed on a full-time basis.

The impact of human rights investigations on forensic science, and forensic anthropology in particular, is multifold. The need for age, sex and stature standards derived from local populations has stimulated population-based research in forensic anthropology. Though historically human rights projects have not focused on research, anthropologists who work on international human rights projects are frequently frustrated by the poor utility of western (mainly U.S.) population standards to other ethnic groups (13,22, 51–52). For instance, Komar (51) found that anthropological estimates of age were incorrect in more than 57% of 59 Bosnian cases that were eventually identified. Similarly, 70% of the anthropological stature estimates did not include the reported height. Attributed in part to variation in expertise, lack of local resources and poor working conditions, Komar notes that the application of non-European standards is another likely source of error. This

echoes earlier warnings imparted by Simmons, et al. (12) and Ross and Konigsberg (13) who have urged the development of local standards in the Balkans. Simmons, et al. (12) utilized probit analysis to develop adult age standards for Bosnians while Ross and Konigsberg (13) used Bayesian statistics and an informed prior of stature from the literature to derive new standards for Eastern Europeans. However, population-specific standards may still not be adequate if reliable antemortem information is lacking. This is particularly acute for stature. Two studies (14,53) found that stature standards based on both U.S. whites and Balkan population samples failed to predict living stature of Eastern European victims. Stature reporting by family members is often relative rather than exact (51). Baraybar and Kimmerly (14) suggest that because living stature is unlikely to be recorded on sustainable documentation, stature should hold less weight than more concrete information obtained from witness or family statements, such as healed trauma. Due to the poor credibility of antemortem stature information, development of population standards, when appropriate, should focus on age and sex information.

In addition to the deficiency of reliable antemortem information, the development of population standards may also be limited by time, funding, lack of positive identifications required to validate the standards, and ethical issues. While metric and morphological data are taken as part of the identification process, confirmation of correct age, sex and stature estimates from positive identifications may take years to complete and, in some countries, the majority of the individuals may never be identified. Thus, the amount of data available for a standards database may be considerably smaller than the total number of remains (53). It is also critical that researchers and the human rights organization administering the project follow appropriate protocols and consider ethical issues.

Given that the majority of individuals killed in atrocities are exhumed from mass graves, anthropologists must also become more familiar with the taphonomic properties of this burial environment. Mant (54) exhumed WWII-era mass graves and first described at length the factors affecting adipocere formation and its role in preserving the body. He further found that bodies buried in the

center of mass graves were better preserved than bodies or body parts at the grave periphery, indicating that physical contact creates a dynamic environment beneficial for preservation (55). Haglund (10) has confirmed these findings and has further developed a list of taphonomic variables that influence preservation, including the presence of clothing, soil pH and drainage, and moisture content within the grave.

Because of the disparate nature of the training of personnel and investigative foci among the groups involved in international investigations, there is concern for the development of international guidelines and standards. The most comprehensive efforts to date have been that adopted by the United Nations (56) and “The Missing” initiative of the International Committee of the Red Cross (ICRC) (57). Finally, as forensic investigations are now becoming anticipated outcomes following (or during) armed conflicts, expectations among those requesting forensic attention have arisen, including contributions to the national forensic infrastructure, such as a DNA database (58), and psychosocial support for families (59–62).

Despite these important advances, the landscape in which international forensic investigations was initially established has drastically changed. Unlike investigations of the 1980’s and early 1990’s, international investigations are not only driven by human rights concerns. High profile media attention, especially since the advent of the *ad hoc* tribunals of ICTR and ICTY, and the attraction of potential funding for large projects has created a market-driven environment. The arena also offers a number of appealing opportunities for forensic anthropologists, including a means of gaining experience for students, a vehicle for career advancement among professional forensic anthropologists and, in some cases, high wages for short-term work. Given the international exposure of forensic anthropology and the significant ramifications of the anthropological work product in international and national courts, it is essential that forensic anthropologists strive to maintain focus on the people they serve—the victims and their families.

Conclusions

Since 1990, EAAF, FAFG, PHR and ICTY organizations have deployed a minimum of 134 anthropologists and archaeologists of 22 different nationalities to 33 countries to investigate human rights atrocities, especially related to mass civilian casualties. This study provides some perspectives on the scope of anthropological involvement in human rights investigations with certain limitations. First, the significant and important work of the FAFG is under represented and is considered preliminary. Second, while every effort was made to report comparable data from different teams, a small number of site types, grave types or primary anthropological roles may have been misclassified. Thus, we emphasize the general trends of the work product over absolute counts of mass graves, sites or projects.

Halfway through the current decade, there is no end in sight for the need for human rights investigations. Indeed, anthropological investigations are underway in nearly every corner of the globe, most recently in the West Bank, Spain, Sierra Leone, Iraq and Indonesia. When we repeat this study in 2011 we expect to see even greater expert anthropological involvement. For instance, ICTY’s effort to exhume mass graves in Kosovo extended into 2000 and enlisted the assistance of forensic experts from 14 countries (63), including a number of anthropologists and archaeologists. Regional teams are also expanding their anthropological workforce, led principally by the FAFG. Since 2000 a number of new human rights teams have emerged that utilize forensic anthropology, including

the International Forensic Centre of Excellence for the Investigation of Genocide (INFORCE) and the Center for International Forensic Assistance (CIFA), both from the United Kingdom, and Archaeologists for Human Rights (AFHR), based in Germany. We also anticipate an increase in the number of anthropologists holding advanced degrees in the U.S. and U.K. as student interest in forensic anthropology in general, and human rights specifically, continues to boom. Finally, we expect anthropologists to continue to take leading roles in the investigations using both traditional and new skills in the recovery and identification of human remains.

Acknowledgments

This work could not be accomplished without the assistance of Mercedes Doretti, Freddy Peccerelli, Alejandra Varel, Ian Hanson, Stephan Schmitt, Shuala Drawdy, Richard Wright, Melissa Conner, Barbara Ayotte and Eric Stover. We are also grateful to the ICTY for granting access to reports and supplying data.

References

1. Bassiouni MC. Crimes against humanity in international criminal law. 2nd ed. Dordrecht (Netherlands): Kluwer Law International, 1999.
2. Stover E, Ryan M. Breaking bread with the dead. *Historical Archaeology* 2000;35(1):7–25.
3. Ball H. Prosecuting war crimes and genocide. Lawrence: University of Kansas, 1999.
4. Goldstone RJ. For humanity: reflections of a war crimes investigator. New Haven: Yale University Press, 2000.
5. McDonald A. Sierra Leone’s shoestring special court. *Int Rev Red Cross* 2002;84(845):121–42.
6. Stover E. Scientists aid search for Argentina’s “Desaparecidos.” *Science* 1985;230:56–7.
7. Snow CC, Levine L, Lukash L, Tedeschi LG, Orrego C, Stover E. The investigation of the human remains of the “disappeared” in Argentina. *Am J Phys Anthropol* 1984;5(4):297–99.
8. Doretti M, Snow CC. Forensic anthropology and human rights. In: Steadman DW, editor. *Hard evidence: Case studies in forensic anthropology*. Upper Saddle River: Prentice Hall, 2003;290–310.
9. Joyce C, Stover E. *Witnesses from the grave: the stories bones tell*. Boston: Little, Brown and Co, 1991.
10. Haglund WD. Recent mass graves, an introduction. In: Haglund WD, Sorg MH, editors. *Advances in forensic taphonomy: method, theory and archaeological perspectives*. Boca Raton: CRC Press, 2002;243–62.
11. Skinner M, York HP, Connor MA. Postburial disturbance of graves in Bosnia–Herzegovina. In: Haglund WD, Sorg MH, editors. *Advances in forensic taphonomy: method, theory and archaeological perspectives*. Boca Raton: CRC Press, 2002;293–308.
12. Simmons T, Cihlarz Z, Kesetovic R. Evaluating age estimation in a Bosnian forensic population: “age-at-stage” via probit analysis. *Proceedings of the 51st Annual Meeting of the American Academy of Forensic Sciences*; 1999 Feb 15–20; Orlando (FL). Colorado Springs (CO): American Academy of Forensic Sciences, 1999;226.
13. Ross AH, Konigsberg LW. New formulae for estimating stature in the Balkans. *J Forensic Sci* 2002;47(1):165–7. [PubMed]
14. Baraybar JP, Kimmerle EH. Thousands dead: the use of stature in individual identification. *Proceedings of the 54th Annual Meeting of the American Academy of Forensic Sciences*; 2002 Feb 11–16; Atlanta (GA). Colorado Springs (CO): American Academy of Forensic Sciences, 2002;230–1.
15. Slaus M, Strinovic D, Petrovecki V. Discriminant function sexing of fragmentary and complete femora: standards for contemporary Croatia. *J Forensic Sci* 2003;48:509–12. [PubMed]
16. International criminal tribunal for the former Yugoslavia. <http://www.un.org/icty/glance/index.htm>.
17. Blewitt GT. The role of forensic investigation in genocide prosecution before the International Criminal Tribunal. *Med Sci Law* 1997;(37)4. [PubMed]
18. Schmitt S. Mass graves and the collection of forensic evidence: genocide, war crimes and crimes against humanity. In: Haglund WD, Sorg

- MH, editors. *Advances in forensic taphonomy: method, theory and archaeological perspectives*. Boca Raton: CRC Press, 2002;277–92.
19. Fondebrider L, Bernardi P, Doretti M. *Archaeological report on site 1 of El Mozote*. New York: United Nations Truth Commission for El Salvador, 1993.
 20. Danner M. *The massacre at El Mozote*. New York: Vintage, 1993.
 21. Burns KR. Forensic anthropology and human rights issues. In: Reichs KJ, editor. *Forensic osteology: Advances in the identification of human remains*. Springfield: Charles C. Thomas, 1998;63–85.
 22. Ferlini R. The role of forensic anthropology in human rights issues. In: Fargrievie S, editor. *Forensic osteologic analysis: A book of case studies*. Springfield: Charles C. Thomas, 1999;287–301.
 23. Argentine Forensic Anthropology Team. Argentine Forensic Anthropology Team (EAAF) annual summary of national and international activities (January, 1991–February, 1992). Buenos Aires: Argentine Forensic Anthropology Team, 1993.
 24. Argentine Forensic Anthropology Team. Argentine Forensic Anthropology Team (EAAF) 1992 annual report. Buenos Aires: Argentine Forensic Anthropology Team, 1993.
 25. Argentine Forensic Anthropology Team. EAAF 1993 annual report. Buenos Aires: Argentine Forensic Anthropology Team, 1994.
 26. Argentine Forensic Anthropology Team. Argentine Forensic Anthropology Team biannual report 1994–1995. New York, NY: Argentine Forensic Anthropology Team, 1996.
 27. Argentine Forensic Anthropology Team. Argentine Forensic Anthropology Team biannual report 1996–1997. New York, NY: Argentine Forensic Anthropology Team, 1998.
 28. Argentine Forensic Anthropology Team. Argentine Forensic Anthropology Team annual report 1998. New York, NY: Argentine Forensic Anthropology Team, 1999.
 29. Argentine Forensic Anthropology Team. Argentine Forensic Anthropology Team annual report 1999. New York, NY: Argentine Forensic Anthropology Team, 2000.
 30. Physicians for Human Rights. *Physicians for Human Rights annual report, 1993*. Boston, MA: Physicians for Human Rights, 1994.
 31. Physicians for Human Rights. *Physicians for Human Rights annual report, 1994*. Boston, MA: Physicians for Human Rights, 1995.
 32. Physicians for Human Rights. *Physicians for Human Rights annual report, 1995*. Boston, MA: Physicians for Human Rights, 1996.
 33. Physicians for Human Rights. *Physicians for Human Rights annual report, 1996*. Boston, MA: Physicians for Human Rights, 1997.
 34. Physicians for Human Rights. *Physicians for Human Rights annual report, 1998–1999*. Boston, MA: Physicians for Human Rights, 2000.
 35. Americas Watch, Physicians for Human Rights, Committee on scientific freedom and responsibility of the American Association for the Advancement of Science. *The search for Brazil's disappeared: the mass grave at Dom Bosco cemetery, March 1991*. Boston, MA: Physicians for Human Rights, 1991.
 36. Americas Watch and Physicians for Human Rights. *Guatemala: getting away with murder, Appendix A*. New York, NY: Americas Watch; 1991.
 37. Middle East Watch and Physicians for Human Rights. *The Anfal campaign in Iraqi Kurdistan: the destruction of Koreme*. New York, NY: Human Rights Watch; 1993.
 38. Physicians for Human Rights and Human Rights Watch/Americas. *Waiting for justice in Chiapas*. Boston, MA: Physicians for Human Rights, 1994.
 39. Physicians for Human Rights. *Report of a preliminary medicolegal investigation of a series of clandestine graves near Pakracka, Poljana, former Yugoslavia*. Boston, MA: Physicians for Human Rights, 1994.
 40. Physicians for Human Rights. *War crimes in the Balkans: medicine under siege in the former Yugoslavia, 1991–1995, Annex II pgs 139–160*. Boston, MA: Physicians for Human Rights, 1996.
 41. Physicians for Human Rights. *Physicians for Human Rights forensic monitoring project, 1998 Inter-joint exhumation process*. Boston, MA: Physicians for Human Rights, 1999.
 42. Physicians for Human Rights. *Physicians for Human Rights forensic monitoring project, 1999 Inter-joint exhumation process*. Boston, MA: Physicians for Human Rights, 2000.
 43. Equipo de Antropología Forense de Guatemala. *Equipo de Antropología Forense de Guatemala informe anual Julio 1992–Julio 1993*. Guatemala City, Guatemala: Fundación de Antropología Forense de Guatemala, 1993.
 44. Equipo de Antropología Forense de Guatemala. *Equipo de Antropología Forense de Guatemala actividades report 1993–1994*. Guatemala City: Fundación de Antropología Forense de Guatemala, 1994.
 45. Equipo de Antropología Forense de Guatemala. *Equipo de Antropología Forense de Guatemala informe de actividades: Julio 1994–Diciembre 1995*. Guatemala City: Fundación de Antropología Forense de Guatemala, 1996.
 46. Fundación de Antropología Forense de Guatemala. *Informe de la Fundación de Antropología Forense de Guatemala: Cuatro casos paradigmáticos solicitados por la comisión para el esclarecimiento histórico de Guatemala*. Guatemala City: Fundación de Antropología Forense de Guatemala, 2000.
 47. Guatemalan Forensic Anthropology Foundation website, <http://garnet.acns.fsu.edu/~sss4407/EAFG.htm>.
 48. United Nations Annual Reports, <http://www.un.org/icty/publications/annrep.htm>.
 49. Simmons T. Taphonomy of a karstic cave execution site at Hrgar, Bosnia–Herzegovina. In: Haglund WD, Sorg MH, editors. *Advances in forensic taphonomy: method, theory and archaeological perspectives*. Boca Raton: CRC Press, 2002;263–76.
 50. Simmons T. Physicians for Human Rights, forensic monitoring project report: Kravica exhumations, federation and Tuzla combined expert team. 1997; http://www.phrusa.org/research/bosnia/fmp_krav.htm.
 51. Komar D. Lessons from Srebrenica: the contributions and limitations of physical anthropology in identifying victims of war crimes. *J Forensic Sci* 2003;48(4):713–16. [PubMed]
 52. Ross AH, Jantz RL. Cranial variation among American Whites, Croats and Bosnians. *Proceedings of the 51st Annual Meeting of the American Academy of Forensic Sciences*; 1999 Feb 15–20; Orlando (FL). Colorado Springs (CO): American Academy of Forensic Sciences, 1999;227.
 53. Jantz RL, Kimmerle EH. Variation in size and dimorphism in Eastern European femora. *Proceedings of the 56th Annual Meeting of the American Academy of Forensic Sciences*; 2004 Feb 16–21; Dallas (TX). Colorado Springs (CO): American Academy of Forensic Sciences, 2004;275.
 54. Mant AK. Adipocere: a review. *J For Med* 1957;4:18–35.
 55. Mant AK. Knowledge acquired from post-war exhumations. In: Boddington A, Garland AN, Janaway RC, editors. *Death, decay and reconstruction: approaches to archeology and forensic science*. London: Manchester University Press, 1987;65–78.
 56. United Nations. *Manual on the effective prevention and investigation of extra-legal, arbitrary and summary executions*. New York: United Nations, 1991.
 57. International Committee of the Red Cross, the missing. <http://www.icrc.org/web/eng/siteeng0.nsf/html/themissing>.
 58. Harvey M, King MC. The use of DNA in the identification of post-mortem remains. In: Haglund WD, Sorg MH, editors. *Advances in forensic taphonomy: method, theory and archaeological perspectives*. Boca Raton: CRC Press, 2002;473–86.
 59. Keough ME, Kahn S, Andrejevic A. Disclosing the truth: informed participation in the ante-mortem database project for survivors of Srebrenica. *Health Hum Rights* 2000;5:68–87. [PubMed]
 60. Stover E, Shigekane R. The missing in the aftermath of war: when do the needs of victims' families and international war crimes tribunals clash? *Int Rev Red Cross* 2002;848:845–65.
 61. Stover E, Haglund WD, Samuels M. *Exhumation of mass graves in Iraq: considerations for forensic investigations, humanitarian needs, and the demands of justice*. *JAMA* 2003;290:663–666. [PubMed]
 62. Weinstein H. Where there is no body: trauma and bereavement in communities coping with the aftermath of mass violence. International Committee for the Red Cross Conference on The Missing: Action to resolve the problem of people unaccounted for as a result of armed conflict or internal violence and to assist their families. Geneva: ICRC 2002.
 63. United Nations Annual Reports, <http://www.un.org/icty/rappannu-e/2000/index.htm>.

Additional information:
 Dawnie W. Steadman, Ph.D.
 Binghamton University, SUNY
 Department of Anthropology
 P.O. Box 6000
 Binghamton, NY 13902-6000
 E-mail: osteo@binghamton.edu