

GAO

Report to the Chairman and Vice  
Chairman, Select Committee on  
POW/MIA Affairs, U.S. Senate

October 1992

# POW/MIA AFFAIRS

## Issues Related to the Identification of Human Remains From the Vietnam Conflict

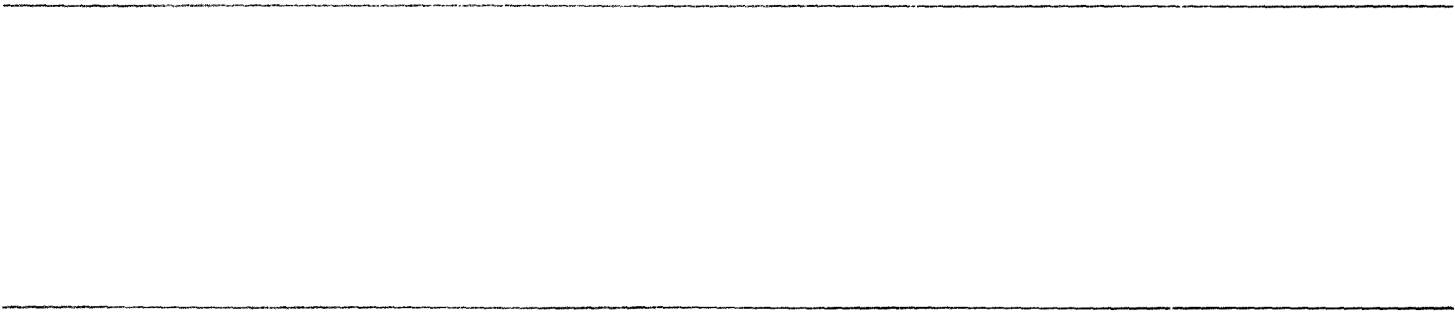


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National Security and  
International Affairs Division

B-249462

October 14, 1992

The Honorable John F. Kerry, Chairman  
The Honorable Bob Smith, Vice Chairman  
Select Committee on POW/MIA Affairs  
United States Senate

This report responds to your request that we review the adequacy of the management controls used to eliminate the risk of improper or unscientific identifications of human remains at the Army's Central Identification Laboratory in Hawaii. This report contains several recommendations to the Secretary of the Army for improving the management of the identification process.

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time we will send copies to the Secretaries of State, Defense, and the Army and other interested parties. We will also make copies available to others upon request.

Please contact me at (202) 275-4141 if you or your staff have questions concerning this report. Other major contributors are listed in appendix V.

A handwritten signature in cursive script that reads 'Richard Davis'.

Richard Davis  
Director, Army Issues

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# Executive Summary

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## Purpose

During the mid-1980s, critics alleged that the Army had inaccurately identified the remains of personnel found in Southeast Asia who had been listed as killed or missing in action during the Vietnam conflict. In 1986 and 1987 congressional hearings held by the House Committee on Armed Services and the Senate Committee on Veterans' Affairs, the Army's Central Identification Laboratory in Hawaii (CILHI) was criticized for using identification techniques that were not accepted by the scientific community and for lacking adequate staff, facilities, equipment, and review procedures. Because of these deficiencies, the committees expressed concern about the identifications made at CILHI.

In December 1991, the Chairman and the Vice Chairman of the U.S. Senate Select Committee on Prisoner of War/Missing in Action Affairs asked GAO to evaluate CILHI's identification efforts. GAO's objectives were to determine whether (1) improvements in CILHI's operations since the congressional hearings were sufficient to minimize the possibility of making erroneous identifications and (2) controls in CILHI's day-to-day management allowed it to effectively oversee the remains identification process. GAO used five private consultants who are forensic experts in the identification of human remains to assist with pursuing these objectives. In addition GAO looked into other matters of interest to the Committee and included this information in appendix II.

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## Background

CILHI, a field operating element of the Army's Casualty and Memorial Affairs Operations Center, was initially established to search for, recover, and identify the remains of military personnel killed or missing in Southeast Asia during the Vietnam conflict. Its mission was later expanded to include the identification of service members killed or missing during World War II, the Korean War, and present-day operations. CILHI is faced with making identifications under difficult circumstances. Medical, dental, and casualty information is often unavailable or incomplete. In addition, the remains it receives often are over 25 years old and involve fragments and pieces of bone that make identification difficult or even impossible. As of September 1992, 2,266 Americans were still unaccounted for from the Vietnam conflict. Also, about 87,000 Americans were listed as missing from World War II and the Korean War. Since 1973, CILHI has identified the remains of 537 Americans, including 381 from the Vietnam conflict.

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## Results in Brief

GAO's review showed that since the 1986 and 1987 congressional hearings, CILHI has taken several actions to minimize the possibility of error in

identifying remains and to enhance its credibility with critics. Specifically, CILHI has revised its practices and procedures to ensure that only scientifically accepted techniques and methodologies are used to identify remains; appointed a world-renowned, board-certified forensic anthropologist as the laboratory's first scientific director and hired qualified staff to perform the identifications; upgraded its facilities and equipment; and incorporated an extensive review process to minimize the possibility of erroneous identifications.

Despite these improvements, however, GAO's review showed that CILHI does not have certain internal controls necessary to manage an efficient identification operation. GAO found instances, for example, when CILHI (1) could not readily locate case files and remains and (2) did not properly document requests for antemortem records to outside agencies. These weaknesses have the potential for contributing to delays in the identification process. GAO's review also showed that the services' absence of physical control over the remains leaving the laboratory had caused either a loss of some remains or unacceptable risks of loss.

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## Principal Findings

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### CILHI Has Made Improvements to Minimize the Chances of Misidentifying Human Remains

CILHI no longer uses controversial and scientifically unacceptable identification techniques. Instead, it uses scientific identification techniques and methodologies that are consistent with or even exceed those employed in other modern forensic science laboratories. CILHI is beginning to take advantage of other techniques to help support an identification, such as the emerging deoxyribonucleic acid (DNA) technology. CILHI used DNA analysis to corroborate an identification in one case and plans to increase the use of this technique in the future.

CILHI has also addressed concerns about inadequate staffing, facilities, and equipment. In 1987, it hired an internationally recognized forensic anthropologist as its director and with his departure in 1991, designated another qualified anthropologist in early 1992 to take his place. In addition, CILHI has added several qualified scientists and casualty data analysts to its staff. After GAO completed its review in July 1992, CILHI's laboratory director and senior anthropologist submitted their resignations. The Army is actively seeking qualified scientists to replace them. In July 1991, CILHI moved to a new facility that was specifically designed for its remains

identification procedures. It has also purchased or has access to needed scientific equipment.

GAO noted that CILHI has incorporated extensive review processes and procedures that make the misidentification of human remains extremely unlikely. For example, CILHI now requires each case to be reviewed several times by CILHI scientists before the recommended identification is made. The Army, as executive agent for all of the services, hires its own consultants to review each recommended identification and render an opinion. The next of kin also is afforded an opportunity to request an additional independent assessment of the recommended identification.

Despite CILHI's improved operations, GAO noted that the role of the Army consultants who review CILHI's recommended identifications is unclear in that the Army has not provided them standard guidelines that specify the types of information each consultant should review in analyzing individual cases. Also, the consultants' review is limited to cases associated with the Vietnam conflict; consultants do not review cases involving identifications from the Korean War or from World War II.

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### **Inadequate Controls Over Case Files and Antemortem Records**

Each missing person's case file generally contains available data on the circumstances surrounding the loss of that person and the results and supporting evidence of the scientific analysis performed. CILHI has had difficulty in maintaining adequate administrative control over these files. For example, CILHI had difficulty locating 25 case files from GAO's sample cases. GAO found that until July 1992, CILHI had not taken a complete inventory of its files.

"Antemortem" (before death) records are used to provide relevant biological information, based on the missing person's medical history, which can then be compared to the remains in making an identification. Currently, CILHI does not have essential data in many of the antemortem records of personnel listed as missing. In some cases, it has no records at all. CILHI officials told us they frequently requested additional records, but that often the responses either took too long or no information was provided. We could not fully determine the extent of the success of CILHI's efforts to acquire needed records because it did not have an adequate control system for documenting these requests and tracking the responses.

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### **Inadequate Physical Control Over Remains**

GAO identified instances in which the services' absence of physical control over remains had caused either a loss of some remains or unacceptable

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risks of loss. For example, the control over remains that have been transferred out of the laboratory for further review by consultants hired by the next of kin has not always been adequate in preventing or minimizing the possibility of losing remains. According to CILHI officials, remains have been returned to CILHI in unsealed containers or with teeth missing. Physical accountability of remains located at CILHI may also be a problem. In some cases, CILHI had difficulty locating specific remains when GAO requested to see them. CILHI officials told GAO that they had never performed a complete inventory of the remains until July 1992.

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## **Recommendations**

In this report, GAO makes recommendations to the Secretary of the Army to improve the roles and responsibilities of the Army's consultants in the review process; to apply the formal consultants' review to Korean War and World War II identifications; and to strengthen controls over the management of remains, antemortem records, and case files.

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## **Agency Comments**

The Department of Defense provided official oral comments on a draft of this report. Department officials stated that the Department (1) generally concurred with GAO's findings and recommendations and (2) plans to take the recommended actions no later than March 1993.

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**Abbreviations**

AFIP	Armed Forces Institute of Pathology
AFIRB	Armed Forces Identification Review Board
BNR	body not recovered
CAPMI	Computer Assisted Post Mortem Identification system
CILHI	Central Identification Laboratory, Hawaii
CMAOC	Casualty and Memorial Affairs Operations Center
DOD	Department of Defense
DNA	deoxyribonucleic acid
GAO	General Accounting Office
JTF-FA	Joint Task Force-Full Accounting
KIA	killed in action
MIA	missing in action
OAFME	Office of the Armed Forces Medical Examiner
POW	prisoner of war

# Introduction

During Operation Homecoming in 1973, the Vietnamese government repatriated 591 U.S. servicemen held as prisoners of war. Since then, there has been speculation that not all prisoners were repatriated and that American military personnel may still be alive in various Southeast Asian countries. According to the Department of Defense (DOD), the United States is committed to repatriating any Americans held captive, to obtaining a full accounting for Americans missing in Southeast Asia, and to retrieving all recoverable remains. President Bush affirmed his commitment to achieving these objectives when he stated, "We will do everything that a government can to recover the missing, and if we discover proof of captivity, we will take action to bring our men home."

Although DOD has thus far been unable to prove that Americans are still detained against their will in Southeast Asia, it continues to investigate "live sighting" reports. While the live sighting issue continues to be the subject of much debate, DOD continues to recover human remains from Southeast Asia and compare them with the files of unaccounted for or missing Americans on Vietnam conflict casualty lists. This report primarily discusses issues associated with the identification of remains of Americans unaccounted for from the Vietnam conflict.

According to DOD, as of September 1992, there were 2,266 Americans still unaccounted for as a result of U.S. involvement in the conflict in Southeast Asia. Table 1.1 shows a breakdown of unaccounted for Americans by country of loss, and table 1.2 shows a breakdown of unaccounted for Americans by component.

**Table 1.1: Americans Unaccounted for in Southeast Asia**

Country of loss	Number MIA <sup>a</sup>	Number KIA-BNR <sup>b</sup>	Total
North Vietnam	347	233	580
South Vietnam	450	625	1,075
Laos	333	189	522
Cambodia	37	46	83
China	4	2	6
<b>Total</b>	<b>1,171</b>	<b>1,095</b>	<b>2,266</b>

<sup>a</sup>Refers to the number of personnel missing in action (MIA) or considered prisoners of war (POW).

<sup>b</sup>Refers to the number of personnel "killed in action-body not recovered" (KIA-BNR).

Source: DOD.

**Table 1.2: Americans Unaccounted for  
by Component**

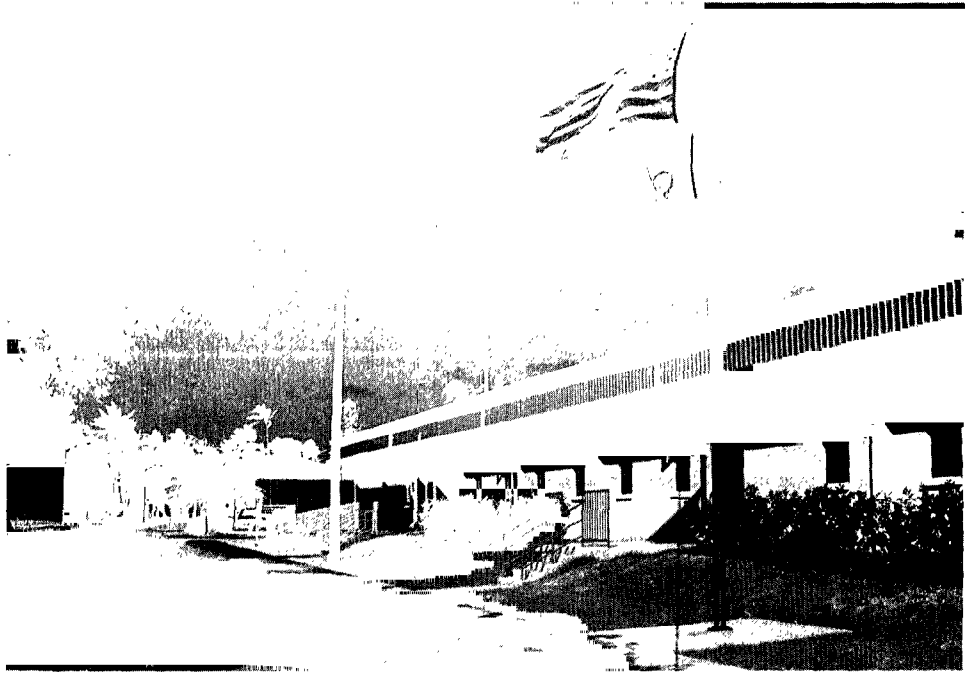
<b>Component</b>	<b>Number MIA</b>	<b>Number KIA-BNR</b>	<b>Total</b>
Army	357	317	674
Navy	120	328	448
Marine Corps	104	179	283
Air Force	553	265	818
Coast Guard	0	1	1
Civilian	37	5	42
<b>Total</b>	<b>1,171</b>	<b>1,095</b>	<b>2,266</b>

Source: DOD.

## **Role and Mission of the Central Identification Laboratory**

The Army is DOD's executive agent for the identification of U.S. personnel killed or listed as missing from past military conflicts. That responsibility resides with the Army's Central Identification Laboratory in Hawaii (CILHI)—the only organization in the military that is primarily responsible for identifying the remains of personnel missing or killed in action. The Central Identification Laboratory, as shown in figure 1.1, was originally established in March 1973 at Camp Samae San, Thailand, following the withdrawal of U.S. forces from Vietnam. The laboratory was relocated to Honolulu, Hawaii, in May 1976.

**Figure 1.1: The U.S. Army's Central Identification Laboratory, Located in Honolulu, Hawaii**



Source: U.S. Army.

CILHI is a field operating element under the Army's Casualty and Memorial Affairs Operations Center (CMAOC). CMAOC, a component of the U.S. Total Army Personnel Command, provides policy guidance and operational control over Army casualty and memorial affairs operations. Specific POW/MIA affairs functions include (1) acting as the Army's point of contact for family members, (2) responding to congressional and public inquiries, and (3) acting as liaison with other government agencies and various POW/MIA family groups. CILHI's mission is to

- conduct search and recovery operations in the Pacific for World War II, Korean War, and Vietnam War dead;
- process remains and establish identities through the use of anthropological, <sup>1</sup> odontological, <sup>2</sup> and other scientific identification techniques;

<sup>1</sup>Anthropology is the study of humans from both a biological and a cultural perspective. CILHI scientists concentrate on physical anthropology, which is the study of human biology.

<sup>2</sup>Odontology is the study of the structure, health, and growth of teeth.

- accumulate and catalog information on American and allied personnel who have been listed as missing in action or declared dead but whose bodies have not been recovered; and
- provide worldwide emergency support for the search, recovery, and identification of the remains of service members killed or missing from current operations. CILHI assisted in identifying the remains of U.S. servicemen killed in the bombing of the Marine Corps barracks in Beirut, Lebanon, in 1983 and the Arrow Air crash in Gander, Newfoundland, in 1985.

As of August 1992, CILHI had a staff of 87 military and 16 civilian personnel. The military personnel primarily concentrate their efforts on conducting search and recovery operations and collecting the medical records of missing personnel, while the civilians primarily focus their efforts on identifying remains. CILHI's operating and search and recovery costs are shown in table 1.3.

Table 1.3: CILHI's Operating and Search and Recovery Costs for Fiscal Years 1989-92

Fiscal year	Operating costs <sup>a</sup>	Open allotment <sup>b</sup>
1989	\$700,000	\$757,000
1990	747,000	1,498,000
1991	816,000	2,014,000
1992 <sup>c</sup>	1,194,000	6,299,000

<sup>a</sup>Figures include funds such as civilian pay, transportation, and general administrative expenses (figures are rounded to the nearest thousand). Military salaries are not included in this figure.

<sup>b</sup>A source of funds used primarily to support search and recovery operations.

<sup>c</sup>Projected dollar increase is due to the expense of more search and recovery efforts during fiscal year 1992.

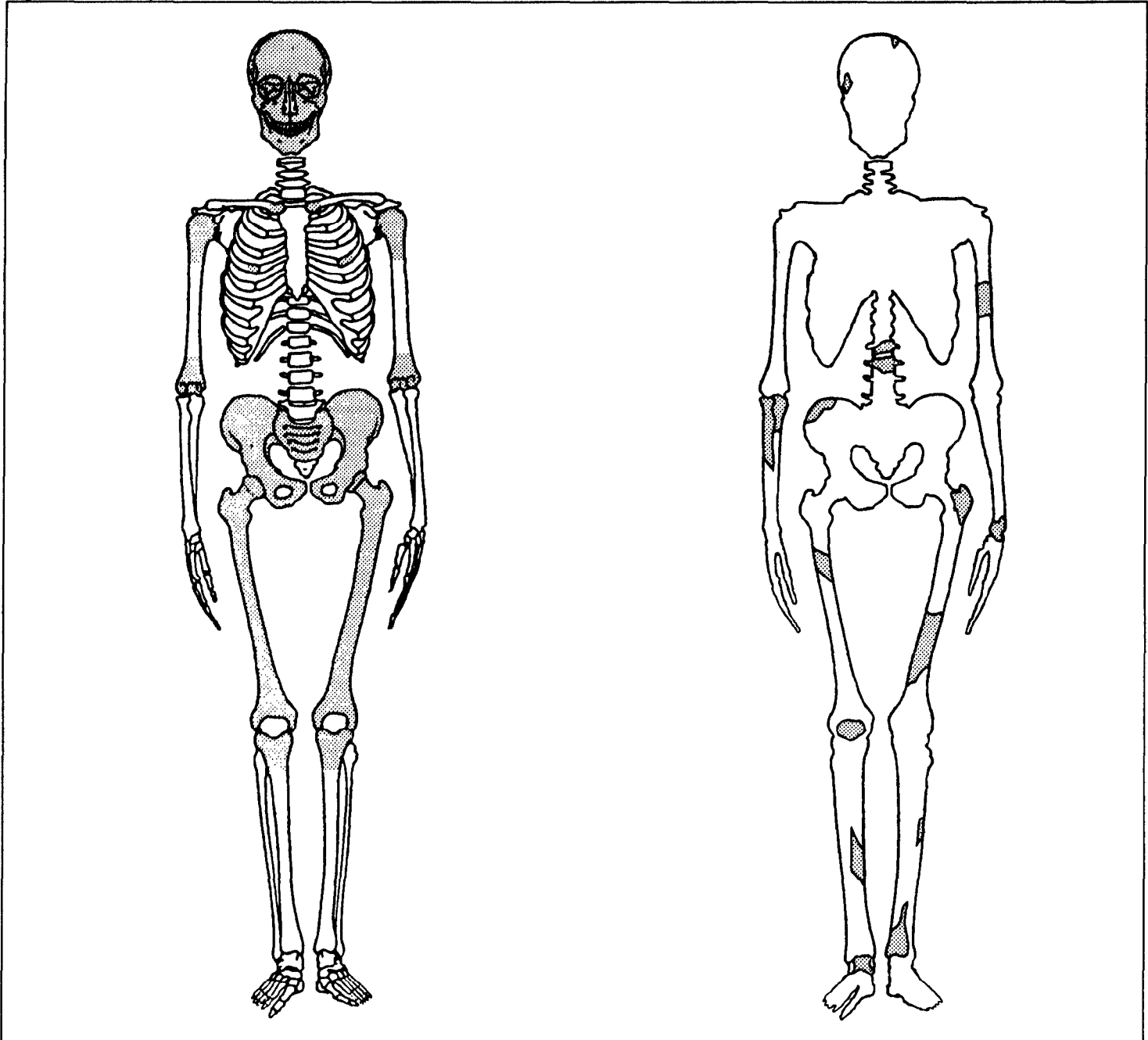
## The Army's Efforts to Identify Remains

The process of identification begins with the recovery and return of remains. After CILHI receives the remains, forensic scientists apply various identification techniques to establish identities. Also, casualty data analysts use existing intelligence information to identify casualties who could be associated with the remains. After the analyses are completed, CILHI attempts to recommend an identification. If an identification is suggested, the Army employs several forensic consultants to review the evidence. This information, along with any information supplied by the next of kin, is presented to a military review board for final resolution. A detailed explanation of the remains identification process for the Vietnam conflict is included as appendix III.

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**CILHI is faced with the difficult challenge of making identifications when sufficient remains are unavailable and/or medical, dental, and casualty information is incomplete. The remains CILHI receives are often over 25 years old and involve fragments and pieces of bone, as shown in skeleton B in figure 1.2. Identifications in such cases are difficult or even impossible.**

Figure 1.2: Comparison of Skeletal Remains



Note: The shaded areas in skeleton A are parts of the bone that are generally most useful for identification purposes, while the shaded areas in skeleton B illustrate fragments of bones that CILHI often receives.

Since 1973, CILHI and its predecessor laboratory have identified the remains of 537 U.S. citizens—381 from the Vietnam conflict, 115 from World War II and the Korean War, and 41 from other events. In addition, some remains received at the laboratory have been identified as other than U.S. personnel. As of September 1992, CILHI records indicated that CILHI had 1,451 cases from Southeast Asia at the laboratory. Table 1.4 summarizes these cases by specific categories.

**Table 1.4: Number of Cases From Southeast Asia Located at CILHI (as of September 1992)**

Category	Number
Hold or working cases <sup>a</sup>	317
Approved CIL-portions <sup>b</sup>	633
Approved as Asian Mongoloids	312
Pending—awaiting final disposition as CIL-portions or Asian Mongoloids	189
<b>Total</b>	<b>1,451</b>

<sup>a</sup>"Hold cases" are cases in which the scientists have completed their analyses of the remains, but additional remains or information is needed before a recommended identification can be made. Some potential for identification exists. "Working cases" are cases that are in the process of being worked on by the scientists and for which some disposition of the remains will be forthcoming.

<sup>b</sup>"CIL-portions" are remains that are insufficient for the purpose of identification. CILHI scientists, with the concurrence of the Armed Forces Identification Review Board (AFIRB), designate remains as CIL-portions when (1) no valid name of a missing individual can be associated with the remains and (2) no scientific estimations can be derived from the remains, such as age, height, and sex. After the remains have been identified as CIL-portions, the case is officially closed, and CILHI retains custody of these remains in the laboratory.

Source: U.S. Army.

## Other Organizations Play Essential Roles in the Identification Process

Although CILHI is the only organization in the U.S. military that is responsible for processing remains from past conflicts and establishing identities using scientific techniques, other government agencies play essential roles in accounting for missing Americans by providing policy guidance, collecting and processing intelligence, and otherwise supporting remains identification. These organizations support the U.S. government's involvement in resolving issues surrounding unaccounted-for Americans.

## Policy Guidance

Efforts to resolve the issue of missing Americans have varied, depending upon the priority placed on the issue by the U.S. government, the international political situation at the time, and Southeast Asian governments' interest in responding to these developments. Currently, the U.S. government is making this issue a "national priority." The following



organizations play an important role in developing U.S. policy towards accounting for missing Americans:

- The U.S. Department of State. The State Department establishes and maintains relations with the Southeast Asian governments. In addition, the State Department chairs the POW/MIA Interagency Group—a government-sponsored group that deals strictly with POW/MIA issues involving Southeast Asia. Finally, the State Department holds policy-level discussions with the countries in Indochina.
- Office of the Deputy Assistant Secretary of Defense for POW/MIA Affairs. This office serves as the principal support for the Under Secretary of Defense for Policy for all POW/MIA matters, with primary responsibility for developing and coordinating policy on such matters and representing DOD on POW/MIA affairs in the interagency process.

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## Data Collection and Processing

The U.S. government's emphasis on resolving the issue of missing Americans has resulted in the need for information on individuals who have been classified as missing or killed in action and whose bodies have not been recovered. The U.S. intelligence community gives high priority to gathering and analyzing data that could provide clues to locating Americans missing in Southeast Asia. Some of the agencies involved in the investigative process include the following:

- Defense Intelligence Agency. This agency has the primary responsibility for evaluating sighting reports of living Americans and collecting data regarding the circumstances of loss of missing personnel.
- Joint Task Force-Full Accounting (JTF-FA). The mission of JTF-FA is to expand and accelerate casualty resolution operations in Southeast Asia with priority directed toward conducting investigative activities to determine whether missing Americans are still alive in Indochina.

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## Identification Support

CILHI relies on a variety of outside agencies to provide information and expertise to assist it in the identification process. Some of these agencies include the following:

- The U.S. Department of State. The State Department provides an essential service to CILHI with respect to the identification process. It is responsible for collecting background information, including “antemortem” (before death) medical and dental records, on all civilian personnel unaccounted for in past wars.

- **Military services.** All branches of the military services are responsible for maintaining accountability over all assigned personnel, and maintain lists of those who deserted during past conflicts. Each service is responsible for maintaining contact with the next of kin during the identification process. It is the responsibility of the respective service to obtain personal background information, which should include antemortem medical and dental records. After remains are identified, they are turned over to the appropriate service, which has the responsibility for returning the remains to the family for their final disposition.
- **Armed Forces Identification Review Board.** The mission of the Board is to review and approve/disapprove the recommended identification of remains made by CILHI of U.S. personnel whose deaths occurred during the Vietnam conflict and whose remains have been recovered or repatriated from Southeast Asia.
- **Armed Forces Institute of Pathology.** The Institute provides consultation services to CILHI using recent developments in deoxyribonucleic acid (DNA) technology, which permit identifications to be made based on skeletonized remains.

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## Objectives, Scope, and Methodology

At the request of the Chairman and Vice Chairman of the Senate Select Committee on POW/MIA Affairs, we reviewed CILHI's operations for identifying human remains recovered from past military conflicts. Of particular interest to the Committee, which began its work in August 1991 and is expected to conclude in January 1993, was the accurate identification of recovered remains and the full accounting of missing personnel. Our objectives were to determine whether (1) improvements in CILHI's operations were sufficient to minimize the possibility of making erroneous identifications and (2) controls in CILHI's day-to-day management allowed it to effectively oversee the remains identification process. In addition we looked into other matters of interest to the Committee and included this information in appendix II.

As agreed with the Committee, we focused our evaluation on identification operations for remains resulting from the Vietnam conflict. Although CILHI also identifies remains recovered from other conflicts, such as the Korean War and World War II, the vast majority of remains that have been identified are those of personnel who served in Southeast Asian countries during the Vietnam conflict. Further, our evaluation focused on identification operations in effect since 1987 because of major operational changes that occurred in the 1987 time frame. We did, however, examine

**pre-1987 operations to a lesser extent to provide a contrast to current operations.**

**We visited the following organizations and interviewed the following persons during our review:**

- **Office of the Deputy Assistant Secretary of Defense for POW/MIA Affairs, Washington, D.C.;**
- **various organizations in the Department of Defense, including the Casualty and Memorial Affairs Operations Center, Alexandria, Virginia; the Armed Forces Institute of Pathology, Washington, D.C.; the Defense Intelligence Agency, Arlington, Virginia; the U.S. Army Central Identification Laboratory, Honolulu, Hawaii; and the Joint Task Force-Full Accounting, Honolulu, Hawaii;**
- **the Smithsonian Institution, Washington, D.C.;**
- **the Federal Bureau of Investigation, Washington, D.C.;**
- **the American Legion, Washington, D.C.;**
- **the U.S. State Department, Washington, D.C.;**
- **Dr. Ellis Kerley, former CILHI Scientific Director, Honolulu, Hawaii;**
- **Dr. Sam Dunlap, former CILHI anthropologist, Reston, Virginia;**
- **Dr. William Bass, Head, Anthropology Department, University of Tennessee, Knoxville, Tennessee;**
- **Dr. William Maples, Curator-in-Charge, C.A. Pound Human Identification Laboratory, Gainesville, Florida; and**
- **Dr. Michael Charney, Forensic Anthropologist, Colorado State University, Fort Collins, Colorado.**

To gain an understanding of remains identification issues and previous work in the subject area, we researched and analyzed past legislative hearings and reports regarding the recovery and identification of remains from the Vietnam conflict. Further, we hired five independent board-certified consultants with extensive forensic experience to assist us in the technical aspects of our work. We asked our consultants to answer a series of questions that dealt with specific aspects of CILHI's operations. In addition, we encouraged our consultants to comment on other issues that they thought needed attention. As a result, some of the consultants' comments are beyond the scope of our review and therefore we have not substantiated their conclusions. However, we believe their opinions provide a basis for deliberation by others. We have incorporated pertinent sections of their evaluations in this report where appropriate. Appendix I contains our consultants' report in its entirety and provides further detail on the scope and methodology for the work they performed.

To achieve our first objective, we focused on several factors important to the successful operation of an identification laboratory. These factors include the proper use of scientifically accepted identification techniques; the quality of resources (facilities, equipment, and staff); and the appropriate review of proposed identifications.

Most of our operational assessment work was focused on the operations of CILHI—the laboratory designated to conduct the identifications of remains recovered from previous military conflicts. We also visited three federally operated and three privately operated laboratories that specialize in human remains identifications to compare and contrast their facilities and equipment with those of CILHI. During our visits to these identification facilities, we interviewed forensic experts and obtained their views on the variety and scientific nature of various techniques that may be applicable to CILHI's identification process.

We also interviewed CILHI scientific staff regarding their identification procedures and practices and examined completed and pending remains case files to ascertain the appropriateness of the identification practices in use. We also interviewed other external forensic scientists and Army consultants to obtain their perspective on CILHI's operations.

To achieve our second objective, we reviewed a statistically valid random sample of 150 cases of the total 416 pending, hold, and working cases as of March 1992 at CILHI to determine the nature and extent of any control problems that might have contributed to delays in the identification process. We examined 113 antemortem medical and dental records of unaccounted for military and civilian personnel (including deserters) to (1) gain a sense of their sufficiency and (2) ascertain what efforts had been made to improve the medical files of these personnel.

We examined CILHI's internal processes for physically controlling the remains and administratively managing the case files. Because identification review processes are an integral part of the entire process, we examined CILHI's compliance with established procedures and evaluated the adequacy of the review process to minimize the possibility of misidentifying remains.

We reviewed JTF-FA and CILHI actions that had been taken to obtain better information from the Southeast Asian governments regarding the recovery or repatriation of remains. We also interviewed Defense Intelligence Agency and State Department officials to determine their roles in

providing information to CILHI on unaccounted for personnel's medical records and the circumstances surrounding their disappearance.

We performed our review from December 1991 through July 1992. As we were finalizing our report in late August 1992, it came to our attention that CILHI's laboratory director and senior anthropologist had announced their intentions to resign in September and October 1992, respectively. In so doing, these individuals expressed concern over several managerial and administrative issues at CILHI that they believed were unresolved and needed attention. As a result, the Select Committee on POW/MIA Affairs asked us to delay issuing this report until we had examined the circumstances surrounding these resignations. We subsequently interviewed both individuals to obtain a clearer understanding of their reasons for leaving CILHI. We were particularly interested in determining whether any of their concerns involved problems that had a detrimental effect on the scientific nature of the identification process. We also discussed these resignations with CILHI, JTF-FA, and CMAOC officials to obtain their views. Our analysis of this issue is included in appendix II.

We performed our review in accordance with generally accepted government auditing standards. Further, we requested and received official oral comments from DOD officials. Their views are included in subsequent chapters where appropriate.

# Operational Improvements Have Minimized the Chances of Misidentifying Human Remains

In the mid-1980's, CILHI's operations came under sharp criticism for questionable practices in the identification and review of human remains. During 1986 and 1987 congressional hearings before the House Committee on Armed Services and the Senate Committee on Veterans' Affairs, for example, CILHI was criticized for (1) using identification techniques that were unacceptable to the scientific community; (2) employing unqualified staff; (3) relying on inadequate facilities, equipment, and reference materials; and (4) lacking an adequate review process. These criticisms did much to damage CILHI's credibility with the Congress, the scientific community, and the families of those personnel who were unaccounted for.

Our review showed that since the hearings, CILHI has taken several actions to minimize the possibility of error in identifying remains. In our opinion, CILHI now uses scientifically accepted identification techniques, employs staff qualified to perform the identifications, has upgraded its facilities and equipment sufficiently, and has incorporated an extensive review process that minimizes the possibility of misidentification.

Although CILHI has improved its operations, there are other opportunities for CILHI to pursue to make its operation even better. These involve contacting other forensic experts for assistance when appropriate, and correcting several deficiencies in the review process.

## Past Problems in Identifying the Remains of Missing Military Personnel

Some of the problems CILHI had been experiencing were evident to three forensic consultants who were hired by the Army to inspect CILHI's operations and facilities in 1985. Their report criticized CILHI for using identification techniques that were scientifically unacceptable and for having inadequate staff, facilities, and review procedures.

According to these consultants, techniques CILHI was using to determine the age and stature of remains could not be used with a high degree of reliability. In addition, these consultants believed that CILHI incorrectly used a scientific technique known as "morphological approximation"<sup>3</sup> to estimate bone fragment lengths and determine stature.

<sup>3</sup>"Morphological approximation," in an anthropological context, is a technique used for determining the length or shape of a fragment of bone by comparing the structure and form of that fragment to those of a sample of bones that is representative of the human population. CILHI's laboratory director told us that a past laboratory supervisor had inappropriately applied this technique by using the bone fragment estimates in a stature formula. Thus, the calculated stature estimates were not scientifically acceptable for making identifications. We saw no evidence that CILHI now uses morphological approximation in an inappropriate manner.

The consultants also noted that CILHI was not being managed by a nationally or internationally known forensic anthropologist who possessed the educational background to be considered a forensic expert and who could provide the credibility the laboratory needed. In addition, they pointed out that CILHI needed more experienced anthropologists and odontologists and other support staff for its identification mission.

Further, the Army's consultants were very critical of CILHI's facility and identification equipment. They stated that the facilities were often inadequate or, at best, barely adequate. The laboratory building, for example, was too small for processing the number of remains entering the laboratory and additional equipment was needed. They pointed out that radiographic (X-ray) equipment was minimal and that there were no facilities for processing radiographs (X-ray films) in the laboratory. In addition, the consultants believed that CILHI's use of a stretcher for lifting and carrying remains rather than a gurney or rollable body table was inappropriate.

The review process at that time was limited to an internal review by the laboratory supervisor. The laboratory supervisor submitted the recommended identification to CILHI's commander, who then submitted it to a final approving board. The consultants noted that this board was composed of three senior embalmers and one senior military officer who were not trained to interpret the findings of forensic scientists. Appendix IV contains a listing of the recommendations the consultants made in 1985 to improve CILHI's operations, the Army's responses, and the conditions at CILHI, as of July 1992, in response to these recommendations.

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## **CILHI Uses Valid Scientific Techniques**

CILHI currently uses scientific identification techniques and methodologies that are consistent with or even exceed those employed in other modern forensic science laboratories. Some of the state-of-the-art techniques CILHI's anthropologists use are as follows:

- **Photosuperimposition:** The comparison of a skull to a photograph of a face, using an overlay technique, to determine whether the skull contains the unique physical facial characteristics of the missing person.
- **Radiographic imaging:** The comparison of "postmortem" (after death) features to "antemortem" (before death) records using X-rays of the skeletal material.

CILHI's odontologists are also using the most advanced, currently available techniques to make identifications on the basis of teeth. Some of those techniques are as follows:

- **Image enhancement:** This technique involves the use of a computer filter of an X-ray film to identify and enhance specific images of the tooth. The computer is able to record measurements of a tooth from the X-ray film.
- **Scanning electron microscopy:** This technique involves the use of an instrument to detect the presence of dental restorative materials, surface defects, tooth and bone pathology, and patterns of normal variation.

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### Use of DNA Technology Could Result in More Identifications

The primary means of identifying remains at CILHI is comparing skeletal and dental remains to antemortem records. However, even with these comparisons, CILHI is constantly faced with the challenge of making identifications under difficult circumstances. Many times, remains are insufficient and medical and casualty information is unavailable or incomplete. To assist in the identification process, CILHI has begun to use DNA technology to support additional identifications.

CILHI does not have the in-house expertise to perform DNA analysis on the remains located at the laboratory. However, under a consulting agreement signed in January 1992, the Armed Forces Institute of Pathology<sup>4</sup> will perform DNA analysis for CILHI. This agreement covers, but is not limited to, DNA work on 75 cases through September 1993. At the time of our review, only preliminary DNA results were available on several cases.

Analyzing DNA from bones or teeth is different from analyzing DNA on blood, hair, saliva, and other types of bodily fluids and tissues. From bones and teeth, DNA scientists try to extract "mitochondrial DNA."<sup>5</sup> The capability to analyze mitochondrial DNA derived from bone is limited to only a few DNA laboratories in the world.

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<sup>4</sup>The Institute has a DNA division, which became operational in March 1991. It is specifically designed to perform DNA-type testing for DOD. In 1991 for example, the U.S. Marine Corps requested the Institute's assistance in confirming an identification made by CILHI scientists. This was the first time the Institute's DNA resources were used to provide evidence in support of a CILHI-made identification.

<sup>5</sup>DNA forensic testing is based upon the fact that each individual has a unique genetic blueprint known as "DNA." The technology is based upon a statistical probability that another individual does not have an identical DNA match. For CILHI's identification purposes, "mitochondrial DNA" samples from human bone tissue are compared to DNA samples from living maternal relatives (for example, a mother, grandmother, or maternal uncle). If there is a DNA match between the remains and the tissue of a living maternal relative, along with other corroborating evidence, this information can be used to support an identification.



Army officials are optimistic that as mitochondrial DNA techniques mature, additional evidence might result in more identifications. Although an identification based upon this technique is not yet fully scientifically accepted, we have been told that DNA technology will “revolutionize” the process for making positive identifications. To make use of this new technique, when it is fully developed, the Army must continue to collect and store DNA samples from living maternal relatives. DOD and Army officials we talked with agreed that the DNA sample collection process needs to be a high priority.

The Army began its initial widespread DNA collection during the July 1992 National League of Families of American Prisoners and Missing in Southeast Asia conference where it collected DNA samples from 90 families. The Army is continuing its efforts to obtain additional DNA samples from the families and plans to have a collection program operational by mid-1993.

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### **Additional Expertise Is Available**

Federal Bureau of Investigation officials told us they could provide some of their services to CILHI, particularly those dealing with photosuperimposition, forensic dentistry, and chemical analysis. These services might assist CILHI in obtaining additional information concerning remains. Also, other specialized services such as fiber and hair analysis and latent fingerprinting can be performed by the Bureau if CILHI has a rare case that requires this service. CILHI officials told us they had used the latent fingerprinting service for a World War II case but had not used any of the other services.

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### **CILHI's Scientific Staff Are Qualified to Perform the Identification Mission**

In February 1987, CILHI appointed an internationally renowned, board-certified forensic anthropologist as its Scientific Director. During his tenure until 1991, this individual helped the laboratory gain credibility in the scientific community. After his departure, the Army promoted one of its senior anthropologists as the new laboratory director. Although the new director is not a board-certified member of the American Board of Forensic Anthropology,<sup>6</sup> she is well qualified to manage the laboratory. She has a doctorate degree in anthropology and is well respected among her peers for her forensic capabilities.

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<sup>6</sup>Board certification is a voluntary process. The absence of this certification does not indicate incompetence or inferior qualifications in the forensic specialty.

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Operational Improvements Have Minimized  
the Chances of Misidentifying Human  
Remains**

As of July 1992, the scientific staff at CILHI consisted of seven anthropologists and two odontologists. Six of the seven anthropologists were involved in remains identification. On the basis of our review of the scientific staff's educational background and case work, we determined that overall, they were qualified to perform skeletal and dental identifications. Table 2.1 provides a summary of the scientific staff's qualifications.

**Table 2.1: CILHI's Scientific Staff's Qualifications (as of July 1992)**

Laboratory position	Forensic specialty	Employment start date at CILHI	Education/certification
Laboratory Director	Physical anthropologist	December 1989	Doctorate/board eligible in the American Academy of Forensic Anthropology
Senior Anthropologist	Physical anthropologist	December 1985	Doctorate/board certified in the American Academy of Forensic Anthropology
Anthropologist	Physical anthropologist	January 1986	Doctorate/certified professional archaeologist
Anthropologist	Physical anthropologist	July 1992	Doctorate
Anthropologist	Physical anthropologist	June 1992	Doctoral candidate
Anthropologist	Physical anthropologist	March 1992	Doctoral candidate
Senior Odontologist	Dentist	July 1990	Doctor of dental surgery/board certified in general dentistry
Odontologist	Dentist	April 1989	Doctor of dental surgery/board certified in the American Academy of Forensic Odontology
Archaeologist	Physical anthropologist /archaeologist	July 1992 temporary position	Doctorate

In late August 1992, after the completion of our review, it came to our attention that CILHI's laboratory director and senior anthropologist were resigning in September and October 1992, respectively. Further, we learned that the contract for the only board-certified odontologist had not been renewed. As of early October 1992, a new laboratory director and senior anthropologist had not been hired.

Our initial analysis of CILHI's staff included the work done by the departing scientists. Because a majority of the identification work is now being performed by recently hired staff, (CILHI hired three anthropologists from March to July 1992 to assist in the identification process), we did not have the opportunity to independently assess the technical aspects of their

work. However, the resigning laboratory director and senior anthropologist told us that the scientific staff were qualified and capable of carrying out the identification mission. Further discussion of this issue is included in appendix II.

The Army is encouraging all of CILHI's scientific staff to become board certified. CILHI is also encouraging and supporting its staff's professional development. According to the laboratory director, CILHI has budgeted resources to allow its scientific staff to attend two training seminars each year and to receive other training as needed. In her view, this policy compares favorably with that of other private laboratories and universities, which usually support their employee's attendance at only one professional meeting each year. In addition to attending scientific meetings and training courses, CILHI scientists present papers at scientific meetings, publish papers in scientific journals, and participate in professional societies. Further, CILHI has reintroduced the "Visiting Scientist Program," which operated only in 1987. This program allows other technical identification experts to become familiar with CILHI's operations and train CILHI scientists in specialized areas.

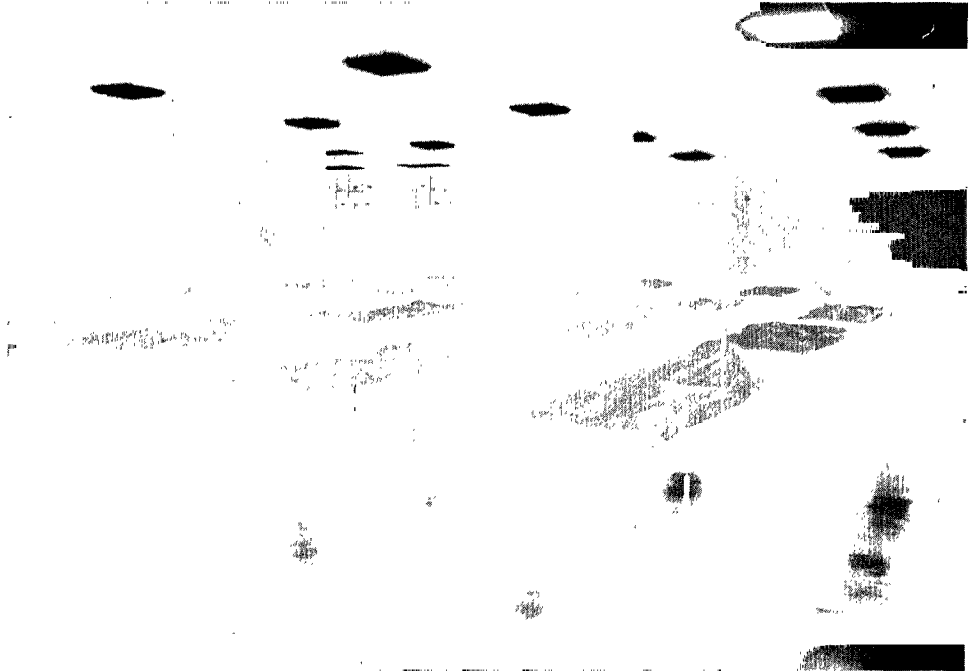
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## **CILHI Has Adequate Facilities and Equipment**

In July 1991, CILHI moved to a new building specially designed for the identification process. This new building offered greater work space for the science laboratory (as shown in fig. 2.1), a records room, and upgraded equipment. In our opinion, the scientific laboratory is sufficient to handle CILHI's current case load. However, if CILHI's work load in the identification of remains increases, additional space may be required.

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Remains**

**Figure 2.1: CILHI's Work Space for  
Identifying Remains**



Source: U.S. Army.

We found that the laboratory either had in place or had access to the modern scientific equipment needed to identify remains. Further, all dental examination equipment was adequate for meeting the needs of the laboratory. We also noted that the laboratory's resources were enhanced by ready access to external resources, including (1) staff and equipment at Tripler Army Medical Center, the Armed Forces Institute of Pathology, the Smithsonian Institution, and the University of Hawaii and (2) professional consultants.

Another enhancement to CILHI's equipment was the introduction of the Computer Assisted Post Mortem Identification (CAPMI) system, which lists certain characteristics of the teeth of the unaccounted for personnel. CAPMI became operational at CILHI in 1987. It allows CILHI to make a computer search of all the antemortem dental records to see whether any compare favorably to a set of dental remains. CILHI officials stated that all available dental records at CILHI of the 2,266 unaccounted for personnel are on the CAPMI system. They also stated that as additional dental records become

available, they are entered into the system. The available dental information on personnel who deserted from the service while in Southeast Asia has also been entered into CAPMI.

Despite CILHI's improvements, we noted a few minor areas in which equipment enhancements might aid the scientists in their work at the laboratory:

- The skeletal comparative collection was in need of repair and, in some cases, replacement.
- There was limited writing space at individual examination tables, and no portable writing table units with attached ring magnifying and contrast lights.
- Library reference materials at CILHI were neither current nor complete. However, CILHI was taking corrective action to acquire the needed materials.

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## **The Army Has an Extensive Review Process, but Further Improvements Can Be Made**

The Army's addition of numerous review levels has significantly improved the review process since 1987 and makes the misidentification of human remains extremely unlikely. In our opinion, the system of checks and balances in CILHI's review process currently exceeds that of civilian forensic laboratories. Currently, the review process includes several staff reviews at CILHI. In support of a recommended identification, CILHI's scientific staff conduct internal reviews of each case for discrepancies. Then, CMAOC contracts the services of three board-certified forensic scientists, normally two anthropologists and one odontologist, to review CILHI's findings and recommendations. These Army consultants review the case files and have the option of examining the remains for which the identification is recommended. These external reviews provide a good check to ensure that CILHI's scientists have not overlooked anything. Next, the evidence supporting an identification is presented to the missing person's next of kin, who has the option of seeking another opinion on the recommended identification. A more detailed explanation of this process is included in appendix III.

Our review of the 158 approved Vietnam conflict cases identified since January 1987 showed that the Army's consultants had found no misidentifications. Out of these 158 cases, we identified 17 cases in which the next of kin had requested a second opinion on their family members' identification. None of these second opinions determined that CILHI had made a misidentification.

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We identified some areas in which the review process showed deficiencies. Specifically, we found that

- the role of the Army's consultants in the identification review process is unclear;
- the Army does not apply the review process uniformly to cases involving personnel missing from all military conflicts; and
- case files available for consultants' review do not always contain pertinent documentation.

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**Role of the Army's  
Consultants Is Not Clear**

The use of Army-hired forensic consultants in the review process provides a valuable check on the identifications being recommended by CILHI. The current on-board consultants helped create and refine the review process. However, because there are no written guidelines or expectations concerning forensic consultants, when they retire or are replaced, their knowledge of the Army's expectations and operations will leave with them. New consultants will lack appropriate guidance to ensure that the system continues to operate smoothly. For example, one recent arrival to the consultant team was initially confused about what the Army required once a case had been assigned to him for review. Another said that written expectations would have been helpful when he started to review identification cases. Army officials agreed that they need to prepare expectations for their consultants.

Also, we noted a few instances in which the Army's consultants had rendered a written evaluation outside their areas of expertise. For example, one of the Army's odontologist consultants commented on a recommended identification on the basis of evidence other than teeth. These comments could be misconstrued or misleading to the families because of the perceived credibility of the scientist.

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**The Army Does Not Apply  
the Review Process to All  
Identifications**

As mentioned previously, the Army has adopted a full review process for the remains recovered from the Vietnam conflict. However, while CILHI is also responsible for identifying remains recovered from World War II and the Korean War, the Army's review process for these remains omits a formal review by Army consultants. The Army consultants' input on these cases is limited to informal comments made during their semi-annual visit to the laboratory.

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**Case Files for Consultants’  
Review Do Not Always  
Contain Pertinent  
Documentation**

Complete case files normally include all available observations, measurements (or “osteometrics”), radiographs, and photographs related to the specific identification. In our sample of 35 approved case files, there were 9 files in which all pertinent information necessary for an independent review of a CILHI identification was not included. For example, in one case that dealt with the muscular development of the remains, we noted that the appropriate measurements and photographs of the portion of the remains in question had not been included in the approved case file to allow an outside reviewer to judge the accuracy of the conclusions reached. In another case, longbone measurements were not available to determine the stature of the remains. These measurements were present in the case file at CILHI but were not present in the file for the consultants’ review. The Army’s consultants, as well as any consultants hired by the next of kin, need a complete case file in order to provide an objective opinion.

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**Conclusions**

Our review of the identification process currently employed by CILHI indicates that CILHI is committed to maintaining high standards of professional performance, as manifested by its appropriate identification methods and techniques, its qualified staff, its new facilities and equipment, and its extensive review process. Currently, CILHI’s improved identification processes and procedures minimize the chances of misidentifications. Nevertheless, CILHI could make further improvements in its operations and procedures.

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**Recommendations**

We recommend that the Secretary of the Army direct the Assistant Secretary for Manpower and Reserve Affairs to include the formal consultants’ review in the identification of remains from both the Korean War and World War II.

We recommend that the Secretary of the Army direct the Director of the Casualty and Memorial Affairs Operations Center to prepare written expectations to clarify the roles and responsibilities of the Army’s consultants. These expectations should include, but not be limited to, standard guidelines or procedures that specify (1) the types of information each consultant should review in analyzing individual cases and (2) whether the consultants should offer professional opinions only in those aspects of the identification process within their specific disciplines.

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We also recommend that the Secretary of the Army direct the Commander of CILHI to take the following actions:

- Encourage the laboratory director to take advantage of other forensic expertise in the scientific community, when warranted. Such expertise may include services offered by the Federal Bureau of Investigation.
- Include in the files given to external consultants for review all pertinent documentation that led to a recommended identification.

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## Agency Comments

DOD officials agreed with our recommendations and stated that they will (1) support external reviews of World War II and Korean War identifications, (2) ensure that all pertinent documentation is made available to the Army's consultants, and (3) continue to encourage CILHI's scientific staff to take advantage of all applicable technical support and identification techniques. CMAOC has already begun to draft procedures to clarify the roles of its consultants.



# Better Controls Would Improve the Management of the Identification Process

Effective internal controls are an important and necessary element of an efficient remains identification operation. Adequate controls are necessary to minimize the possibility of the loss of or damage to remains. Likewise, the proper control of case files and medical and dental records is important for managers and scientists to effectively accomplish the remains identification mission. Lost, misplaced, or incomplete files and records can hamper identification efforts and make it difficult or even impossible to identify remains or properly review identification decisions.

Our review showed that in some cases, the internal controls necessary to manage an efficient identification operation did not exist or were not followed. We found instances, for example, in which (1) procedures for documenting the remains entering the laboratory were not consistently applied, (2) case files and remains could not be readily located, (3) case files were missing key data needed to make or review identification decisions, (4) personnel were unable to easily track the status of cases, and (5) personnel were not adequately documenting their requests and follow-up actions for additional antemortem medical or dental records for missing personnel. Although we found no evidence that any of these weaknesses had led to erroneous identifications, they have contributed to delays in the identification process. Our review also showed that the services' lack of physical control over the remains had caused either a loss of some remains or had resulted in unacceptable risks of loss. We also found that CILHI destroyed some small fragmented remains on several occasions.

## Inadequate Physical Control Over Remains

The physical control of received remains is essential to minimize the possibility of losing or damaging them. CILHI officials have (1) not consistently controlled the receipt of remains entering the laboratory and (2) not devised a storage system that allows users to readily locate remains. Further, all of the services have not approved and implemented procedures to adequately control remains transferred out of the laboratory to consultants hired by the next of kin. Finally, the Army has not developed a written policy forbidding the destruction of remains recovered from the Vietnam conflict.

## Inconsistent Documentation of the Receipt of Remains

Remains arriving in the laboratory can range from complete or nearly complete skeletons to a few small and delicate bone fragments. Depending on the source, they are received in a variety of containers, including coffins, boxes, plastic bags, and envelopes. CILHI's receiving procedures

require that remains be given a processing number, be recorded in a log book, and be photographed while still in and immediately after being removed from the receiving container. The responsible anthropologist and/or odontologist is then required to prepare a written description and preliminary analysis of the remains, which, along with the photographs, become part of the case file documentation.

CILHI scientists were not consistently following the established procedures for documenting the receipt of received remains. Our review of 12 case files showed that half of them were missing photographs of the remains. Although it is CILHI's policy that all remains be photographed upon receipt, the laboratory director told us that this policy was not consistently carried out prior to 1989. Photographs were only consistently taken for remains officially repatriated from Southeast Asia. The director believes, however, that this policy is currently being followed for all remains received, regardless of their source. Even so, while we were at CILHI in March 1992, we observed an instance in which the remains had been removed from an incoming container before the required photographs had been taken.

Although we are unaware of any loss of remains that resulted from these incidents, the absence of photographs represents a loss of control because, at a later date, officials may be unable to tell whether they have all skeletal fragments.

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### Ineffective Controls Create Difficulty in Locating Stored Remains

CILHI is responsible for ensuring that received remains are adequately stored and protected from damage or tampering. While the CILHI facility is secure and affords adequate protection from unauthorized personnel, the current storage system and related procedures have caused scientists to have difficulty in readily locating remains. As a result, scientists must sometimes delay their examinations in order to search for remains.

During our review, we tested CILHI's capability to readily locate remains in storage. During our initial test, we asked CILHI officials to locate the remains of five cases that we specified. Although they had no difficulty locating two of the cases, they did have difficulty finding the remaining three cases because they were not in the containers in which they had originally been stored. It took several days to account for one case. Subsequently, we asked CILHI officials to locate the remains of an additional 12 cases. The laboratory director had to search multiple containers to locate the remains but was able to find them the same day.

Under CILHI's storage system, remains are typically placed in sealed plastic bags, given processing numbers, and then stored in boxes, as shown in figure 3.1. Some boxes may contain as many as 50 bags of remains per box.

**Figure 3.1: CILHI's Storage Area for Skeletal Remains**



Source: U.S. Army.

The specific location of remains depend on three factors—the anthropologist who has been assigned the case, the processing number, and the case disposition. Case disposition categories include “hold or working cases,” pre-1986 cases, “CIL-portions,” Asian Mongoloids, and refugee cases. As remains are examined and their status changes, the scientists, each of whom has the responsibility for properly storing and transferring remains for their assigned cases, move them from one box to another.

The complexities of this storage system demand that adequate controls be established and followed if remains are to be easily located. However, CILHI has not established adequate controls. For example, with few exceptions, no inventory listings were attached to the storage boxes showing what remains were in the containers. Further, although CILHI does maintain a log that indicates the current status or disposition of the remains, it does not indicate the storage location. Under these conditions, only the scientist who transferred the remains from one box to another knows where the remains are located.

CILHI officials acknowledged problems with the storage system and from June to July 1992, completed a 100-percent inventory of the remains. CILHI officials told us they had never performed a complete inventory of the remains until this time. Until CILHI establishes an effective storage control system and supplements this with periodic inventories, it cannot be assured that all remains are accounted for and can be readily located.

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### **Procedures for Controlling Remains Outside the Laboratory Are Being Revised**

To prevent loss or damage, it is also important to maintain control over remains while they are outside the laboratory and no longer under CILHI's immediate control. CILHI officials told us that on several occasions, controls had not been effective in safeguarding remains when they were outside CILHI's control. In particular, the problems that have arisen occurred in cases when the remains had been transferred to a consultant hired by the next of kin for further examination. CILHI officials told us of instances in which remains had been returned to the laboratory either in an unsealed container or with some teeth missing.

Under the Army's identification review procedures, the next of kin is permitted to have remains examined by a consultant of his or her own choosing after CILHI has made a recommended identification. When this occurs, CILHI initially transports the remains to Travis Air Force Base, California. According to CMAOC officials, military service personnel then escort the remains to the designated consultant but may or may not stay with them until the examination is complete. After the examination is completed, the remains are to be placed in a sealed container and returned with a military escort to Travis Air Force Base for shipment back to CILHI.

CMAOC officials believe that the control problems rest with the military services who have the responsibility for the care and handling of the remains with the next of kin's consultants. According to CMAOC officials, there are no DOD-wide accepted written procedures for these situations,

and each service exercises discretion over how it handles the remains. CILHI officials further stated that military escorts do not routinely inventory the remains when they receive them from consultants.

In an effort to rectify the situation, CILHI officials prepared standard operating procedures to be used by all military services in the control over remains. As of July 1992, all military services except the Air Force had signed a memorandum of understanding to support these procedures, which stipulate how control should be maintained when the remains are not under the direct control of CILHI. Until a strict control procedure is adopted and properly implemented by each service, the Army cannot ensure that remains will always be returned to CILHI intact.

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## **Destruction of Remains**

It is CILHI's current practice to retain all unidentifiable remains received in the laboratory, regardless of the size, number, or quality of the skeletal fragments and their likelihood of ever being identified. This has not always been the case. On several occasions in past years, CILHI has destroyed remains that, according to CILHI officials, were small, fragmented, and of such poor quality that identification was virtually impossible.

CILHI is currently storing remains for over 600 cases that have been identified as "CIL-portions." The primary source of these remains is Southeast Asian refugees, many of whom have the perception that the U.S. government will provide money or migration assistance in exchange for the remains of missing personnel or information. As a result, CILHI receives many remains that have proven to be of little value in establishing the identities of Americans listed as missing in action from the Vietnam conflict.

Our examination of CILHI's records showed that the remains from 9 cases were destroyed in 1975; the remains from 2 cases were destroyed in 1976; and the remains from 25 cases were destroyed in March 1985. Most of the remains had been recovered from Vietnam. The 1975 and 1976 cases were destroyed when the laboratory was located in Thailand, and the 1985 cases were destroyed by CILHI officials. CILHI cremated the remains at the direction of a specially created Board of Officers under the auspices of the Army's Military Personnel Center. According to CILHI's commander, Army Regulation 638-40, "Care and Disposition of Remains," does allow for the disposal of these types of remains under certain circumstances. Our review of the regulation, however, showed it to be unclear with respect to any destruction of possible remains from military conflicts. A CMAOC

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official told us that following the destruction incident in 1985, a member of the POW/MIA Interagency Group <sup>7</sup> orally directed CILHI to discontinue the destruction of Southeast Asian CIL-portions.

According to CILHI officials, CILHI has complied with this direction, and our examination of the files disclosed no evidence of the destruction of other remains. However, no written policy exists that would preclude the possibility of remains being destroyed in the future. In view of the possible advent of future identification technologies and the possibility that remains that are now considered unidentifiable could be identified in the future, we believe a formal policy forbidding the destruction of remains needs to be issued.

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## Inadequate Controls Over the Management of Case Files

The proper control and management of the case files associated with received remains are important elements of an efficient identification operation. Proper case management allows users to readily locate files, examine all available documentation on the case, and track the status of cases as they progress through the identification process. Our review showed that CILHI had some problems in each of these areas.

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## Locating Files Is Sometimes Difficult

CILHI has not developed an effective case file tracking system that ensures that all scientists have quick access to case files in the event that (1) specific questions arise over a case or (2) more remains or information is received for a specific case and needs to be included in the file. As a result, case files are sometimes difficult to find.

During our review of 150 sample case files at the laboratory, we found that CILHI officials could not easily locate all of the files. In some cases, working files were mixed with files for cases that had been completed. CILHI officials initially had difficulty finding 25 of the 150 files we sampled. In 14 of the 25 cases, the files were found in the offices of scientists who were on search and recovery missions in Southeast Asia. In the remaining 11 cases, we learned that, although documentation such as anthropological reports existed on each of the cases and was lying on various personnel's desks, no file folders had been created for the cases.

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<sup>7</sup>The POW/MIA Interagency Group develops, monitors, and evaluates U.S. policy regarding POW/MIA issues. It includes representatives from DOD, the Joint Chiefs of Staff, the White House National Security Council Staff, the Defense Intelligence Agency, the Department of State, and the National League of Families of American Prisoners and Missing in Southeast Asia.

Although CILHI officials eventually accounted for all 150 files, their efforts indicate an ineffective file-locator system. CILHI officials are implementing new policies and procedures to improve their control over case files. The new policies and procedures include tracking the possession of individual files, physically storing the different categories of files in different areas, and ensuring that files are created for all cases.

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### **Determining the Contents of Case Files Is Difficult**

CILHI has no formal procedures to control the contents of its case files. Controlling file contents is important because CILHI officials need to know whether specific information or documentation of analyses has been completed and whether and by whom this information has been removed from the file.

CILHI does not inventory the contents of its files until a disposition (for example, a recommended identification) is being recommended for the remains. For working cases, we found that some scientists occasionally remove the contents of a file while they are working on a case. Other scientists, including the laboratory director, who pick up that file have no way of knowing what work might have been completed on that case or what important information might be missing from the file. Without controlling the files' contents, CILHI officials cannot determine, for example, whether photographs and anthropological or odontological descriptions of the remains have been added to or removed from the file. The photographs and descriptions are important to documenting and maintaining control over the remains.

CILHI officials have acknowledged this problem and are devising new procedures to correct it. The new procedures essentially include maintaining a master inventory list for each file on which scientists can record the contents.

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### **Tracking Cases' Progress Is Sometimes Difficult**

CILHI's management has no systematic method of tracking the progress scientists have made in identifying remains. Tracking the progress of cases facilitates the coordination of work, helps to ensure that work has progressed on all cases, and enables personnel to respond to external inquiries regarding cases.

CILHI has two sources of information for tracking cases. The first is a log book in which the laboratory administrator <sup>8</sup> records pertinent information

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<sup>8</sup>The laboratory administrator is an assistant to the laboratory director.

on a set of remains when it arrives at CILHI and when a final disposition is approved. The progress of work completed on a case is not recorded in this log. The second source of information, which is maintained by the laboratory director, is an informal data base that tracks the progress of the cases. Although this data base contains every case, it is not systematically updated and contains some errors.

We found that CILHI officials had no formal method of ensuring that remains, which may sometimes be set aside to do higher priority work, were eventually worked on at a later date. For instance, officially repatriated remains receive a higher priority than remains received by other means because they are more likely to result in identifications. According to CILHI's laboratory administrator, CILHI scientists have been able to make only one identification from remains supplied by unofficial refugee sources since 1987. All other identifications have been from remains officially repatriated from Southeast Asian countries or from U.S. military search and recovery efforts.

For the 150 cases we sampled, we found that work had not continued on 11 cases since the initial assessments were completed after the remains arrived at CILHI (one case had not been worked on for several years). The laboratory director told us that each of those 11 cases consisted of small bone fragments from which no significant determinations could be made and that no further work could be completed. However, the files remained open and, in some instances, contained nothing more than the preliminary analysis of the remains.

In addition, we found that CILHI anthropologists and odontologists working on the same cases fail, at times, to coordinate their efforts. Under CILHI's current system, anthropologists and odontologists analyze remains independently to maximize objectivity. They then compare findings to determine whether all possible work has been completed. The responsibility for coordinating the efforts has been left to the individual scientists. We noted that because the anthropologists and odontologists usually complete their respective analyses at different points in time, they do not always compare results before beginning work on other cases. An effective tracking system would help to ensure that cases are progressing satisfactorily.

CILHI officials are implementing new guidelines and procedures for processing remains at CILHI. Under these procedures, the laboratory director becomes the focal point for all scientific analyses and thus is

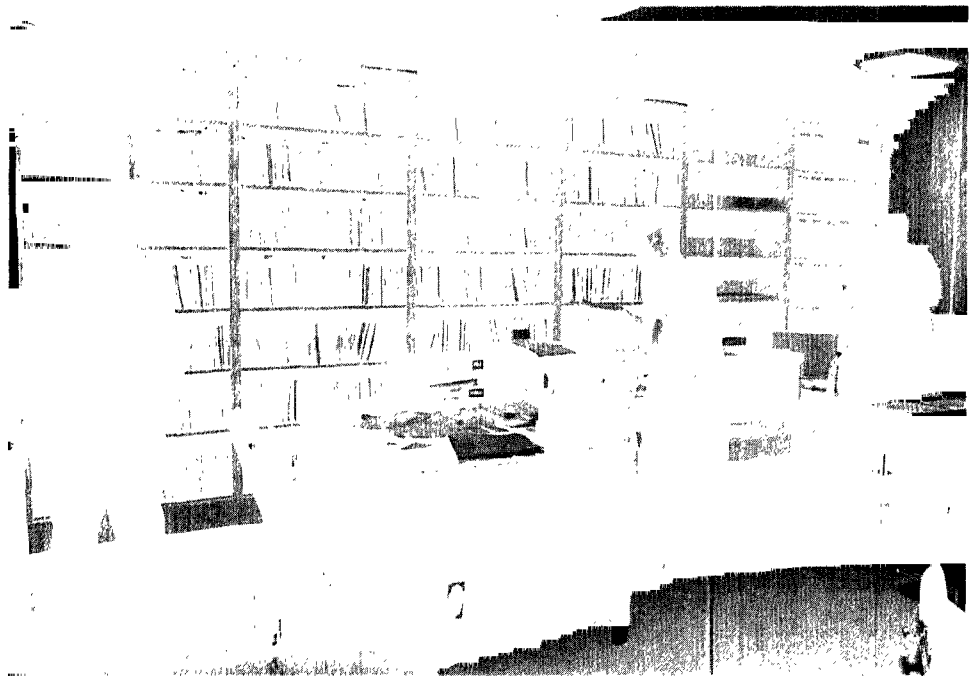


responsible for ensuring that the scientists coordinate their work. CILHI's laboratory director is also implementing a system to track work progress on the remains on a weekly basis. The system involves the creation of a new computerized data base to be maintained by the laboratory director. The data base will be updated by the scientists as work progresses on their cases.

### **System Needed to Better Document Efforts to Obtain Antemortem Records**

The antemortem medical and dental records of missing personnel play an important role in the remains identification process. Regardless of the quality or completeness of received remains, sufficient records must be available for scientists to make a recommended identification. If these records do not contain the information necessary for comparison with the remains, the opportunity for an identification may be lost.

**Figure 3.2: CILHI Analysts Filing  
Medical and Dental Records of Missing  
Personnel**



Source: U.S. Army.

Our review of 113 antemortem records on file at CILHI showed that in many cases, the records did not have all of the essential information typically needed to make an identification. CILHI officials told us that they requested additional records from the military services and the State Department but that often the responses either took too long or no information was provided. We could not fully determine the extent of the success of CILHI's efforts to acquire needed records because CILHI did not have an adequate control system for documenting these requests and tracking the responses.

Although the insufficiency of remains is the primary cause of CILHI's inability to identify all received remains in the laboratory, the insufficiency of antemortem records is a contributing cause. We reviewed 150 of 416 unresolved<sup>9</sup> cases in the laboratory and found that CILHI had determined that 11 cases, or about 7 percent of our sample, could not be identified due to insufficient antemortem medical or dental records. Although CILHI officials told us that more records in these cases would not necessarily result in recommended identifications, more records would, as a minimum, be helpful in narrowing the field of possible candidates.

We also examined selected military medical and dental records at CILHI of missing American military and civilian personnel from Southeast Asia and found that many did not contain information that the laboratory director cited as important to maximizing the potential for identifying remains. The laboratory director indicated that an ideal record should contain dental charts, dental X-rays, photographs, medical history, and information about the incident of loss. Table 3.1 shows the completeness of this type of information in the files of missing American military personnel (including deserters) and civilians. As shown in the table, the records for military personnel were generally more complete than those of deserters or civilians.

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<sup>9</sup>As of March 1992, the unresolved cases included 283 cases in which examination work was in progress or being held pending the receipt of additional information and 133 cases that had been tentatively determined to be CIL-Portions or Asian Mongoloids.

**Table 3.1: Completeness of Missing Americans' Antemortem Records for Selected Military and Civilian Personnel in Southeast Asia**

Numbers in percentages					
Category	Dental charts	Dental X-rays	Photograph	Medical history	Casualty data
Military	84	56	64	80	84
Military deserter	43	14	19	67	<sup>a</sup>
Civilian	26	12	88	14	48

Note: Entries are based on a review of 50 military personnel records, 21 military deserter records, and 42 civilian personnel records.

<sup>a</sup>Not applicable.

To improve the contents of its antemortem records, CILHI must rely on other organizations to supply the needed data. Each of the military services, for example, is responsible for providing this data, if requested, for its missing personnel. The State Department is responsible for providing similar information for missing civilians. CILHI's casualty data analysts are responsible for requesting additional records from these agencies.

Although CILHI officials told us that they request additional antemortem record data when they need it and make follow-up requests as necessary, we were unable to determine from their documentation how effective they were in performing these tasks or how responsive the agencies were to CILHI's requests. Our review of the antemortem records showed that CILHI had documented a request for additional information on only 1 of the 21 missing military deserters. Further, CILHI had documented its requests for information on only 12 of 42 missing U.S. civilians. For example, while one civilian file contained only the individual's name and date of birth, there was no indication that a request had been made for additional information.

## Conclusions

CILHI's managerial controls, especially its physical control over remains and its management of case files, need improvement. Although these problems have not affected CILHI's ability to meet its mission or caused any erroneous identifications, they have created some inefficiencies in the identification process. CILHI needs to strengthen its procedures to ensure that it makes proper identifications in a timely manner.

## Recommendations

We recommend that the Secretary of the Army direct the Assistant Secretary for Manpower and Reserve Affairs to

- strengthen procedures over the control of remains to ensure that all remains returning to CILHI after independent examinations have been completed are documented and accounted for; and
- clarify Army Regulation 638-40 by specifically forbidding the destruction of remains recovered from the Vietnam conflict.

We recommend that the Secretary of the Army direct the Commander of CILHI to

- direct laboratory personnel to follow established procedures for the receipt and documentation of remains when they enter the laboratory;
- direct the laboratory director to establish procedures that enable laboratory personnel to (1) readily locate all case files and remains, (2) determine the contents of case files, and (3) track the progress of all cases; and
- establish a system that requires laboratory personnel to (1) fully document requests for antemortem medical and dental records and the extent of the responses received and (2) follow up on all nonresponses to requests in a timely manner.

## Agency Comments

DOD officials agreed with our recommendations. They told us that they plan to approve service-wide procedures for the control of remains by December 31, 1992. DOD officials also said that they will clarify Army Regulation 638-40 and plan to issue a DOD Directive forbidding the destruction of remains by March 1993. Further, the Army has begun several corrective actions to address other recommendations. For example, CILHI is in the process of obtaining a new computer data base system to improve its case file tracking abilities and has developed a system to fully document and track all requests for antemortem medical and dental records. Finally, officials told us that the laboratory director will ensure that all laboratory staff adhere to established procedures for controlling remains and case files.



# Assessment of CILHI's Operations and Facilities: Consultants' Report to GAO

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## Introduction

GAO tasked five consultants to provide a technical assessment of CILHI's operations and facilities to determine whether they were adequate for CILHI to perform its mission of identifying human remains from past conflicts. The consultants responded to a list of questions GAO provided. GAO also encouraged the consultants to note observations not elicited by the questions. As a result, some of the consultants' comments are beyond the scope of our review and therefore we have not substantiated their conclusions. However, we believe their opinions provide a basis for deliberation by others. The findings presented in the report represent these experts' unanimous opinion, unless otherwise noted.

GAO selected these consultants because they (1) had extensive work experience directly related to the human remains identification process, (2) had earned a doctorate in their respective professions, (3) were members of the American Academy of Forensic Sciences, (4) were board-certified in their area of expertise, and (5) had not performed any recent Army-affiliated work on identifying remains.

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## Procedure

On March 3, 1992, the consultants arrived in Washington, D.C., and GAO personnel briefed them on the scope of their assignment. From March 3 through March 6, they reviewed 35 approved identification case files at the Casualty and Memorial Affairs Operations Center in Alexandria, Virginia. The consultants assessed the adequacy of CILHI's documentation and identification techniques.

From March 9 through 13, 1992, the consultants inspected the operations and facilities at CILHI in Honolulu, Hawaii. They interviewed the laboratory's commander, scientific and administrative staff, and former employees; reviewed approximately 100 pending files, including antemortem records, for adequate documentation and acceptable identification techniques; and inspected the equipment and facilities to determine whether they were adequate to support human remains analysis. For approximately 15 cases, they performed an in-depth review that included an examination of the remains and a remeasurement of skeletal elements to assess the accuracy of CILHI's measurements.

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## Consultants' Report

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### Consultants

Dr. Brian D. Blackbourne, Forensic Pathologist, San Diego County Medical Examiner, San Diego, California.

Dr. Diane L. France, Forensic Anthropologist, Director, Laboratory for Human Identification, Colorado State University, Fort Collins, Colorado.

Dr. Rodger Heglar, Forensic Anthropologist, Consultant, La Jolla, California.

Dr. James L. Luke, Forensic Pathologist, Behavioral Science Investigative Support Unit, Federal Bureau of Investigation Academy, Quantico, Virginia.

Dr. John D. McDowell, Forensic Odontologist, Assistant Professor, University of Colorado School of Dentistry, Denver, Colorado.

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### Introduction

CILHI's mission is to identify the remains of U.S. service personnel killed in World War II, the Korean War, and the Vietnam conflict. This mission is of the highest national priority. Consequently, CILHI and its scientific staff must be held to standards at least equaling, and should be striving to standards surpassing those of any other identification laboratory in the world. Public scrutiny of this laboratory is intense, both because of the importance of its mission and because of past criticism of its operations. Therefore, our comments are intended to suggest ways not only to raise CILHI's standards above their already high levels but to decrease the possibility of future problems with the identification process.

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### Questions

A. Is CILHI using generally accepted techniques to make identifications?

(1) How do CILHI's scientific identification techniques compare with those used by reputable public or private forensic institutions?

CILHI's application of anthropological and odontological methods are consistent with those employed in other reputable modern forensic science laboratories. For example, CILHI scientists utilize the Suchey-Brooks methods to determine age in the pubic symphysis,

Iskan-Loth method to determine age of the sternal rib, Trotter-Gleser methods to reconstruct stature using intact longbones, and Steele's method to reconstruct stature using sections of incomplete skeletal remains. These are among accepted, generally utilized anthropological methods of identification. The scientists at CILHI use the most advanced odontology techniques currently available. The laboratory also uses image enhancement and digitization techniques.

We are aware that CILHI has been criticized for continuing to use a technique known as morphological approximation to identify remains. This technique was used prior to 1985 by a former CILHI laboratory supervisor to determine the length or shape of a bone by comparing the morphology of a bone fragment to a complete bone which contained a segment of similar size or shape to the unknown fragment. In some instances, this calculated length was then used in regression formulae to estimate the stature of the individual. This is not an acceptable scientific technique as so defined, as the fragment is being compared to only one or two bones of similar size and shape, and not to a statistically significant sample. This sample cannot be said to necessarily represent the population as a whole, and so may give results outside the range of normal human variation.

We saw no evidence, however, that CILHI currently uses morphological approximation in an inappropriate manner. Rather, CILHI uses morphological approximation in its acceptable form, where that fragment or single individual is compared to a statistically significant sample. In this way, anthropologists calculate stature, for instance, from regression formulae derived from sections of bone from hundreds of individuals of known stature. This is an acceptable scientific technique, because enough individuals were used to derive the stature formulae that the normal variation inherent in the population is represented in those sections.

(2) Is CILHI using the most modern scientific techniques available?

CILHI continues to use the most modern scientific methods available, such as the Computer Assisted PostMortem Identification system (CAPMI), production and analysis of radiographic images, and the use of standard anthropometric and anthropomorphic techniques. In addition, the laboratory is participating with the Armed Forces Institute of Pathology (AFIP) to determine the feasibility of using skeletonized and dental source material for DNA identification purposes. CILHI can contract with outside forensic specialists who provide the laboratory with photosuperimposition



studies on an as-needed basis. Scanning electron microscopy (SEM) is available to CILHI and is used to detect the presence of possible dental restorative materials, examine surface defects and alterations of teeth and bone, determine tooth and bone pathology, and observe patterns of normal variation. Radiographic consultation is available at Tripler Army Medical Center for ante- and postmortem comparisons of skeletonized and dental material for identification purposes. Oral/maxillo-facial radiologists are also available to CILHI.

Our review indicates that CILHI is committed to maintaining high standards of professional performance, as manifested by its use of modern facilities, equipment, and analytical methods. Recognizing that CILHI can only continue its commitment to excellence with appropriate funding, we recommend that requests for funding be fully supported.

(3) Have the scientists exhausted all possible means of identification? If not, what other methods should be used?

CILHI performs more in-depth analysis to establish identifications than most other forensic laboratories in the world. However, in addition to the fragmentary nature of most of the remains, we noted that the shortage of antemortem records is the principal obstacle in establishing identifications.

Antemortem records are essential to make a remains identification. Antemortem records may be inadequate, inaccurate, or may not even be available. Civilian and military antemortem records, if not collected immediately by the services and stored at CILHI, could be lost or destroyed as time passes. The services and CILHI should make a concerted effort to obtain antemortem records from past conflicts, and in the future, the collection of records should begin immediately after a service member is reported as being a prisoner of war, missing in action, or killed in action with body not recovered.

To collect military records, CILHI currently must send messages through normal military channels. Acquisition of civilian medical and dental records is currently routed through the Department of State. CILHI officials informed us that responses from both of these channels are inadequate. Records often become available only after multiple requests have been forwarded. Long delays to transmit the records are not uncommon, and occasionally, CILHI does not receive a response to its request.

Therefore, we recommend that military and civilian records acquisition be given a higher priority status. Investigators from the military services, and responsible to CILHI, should be utilized to acquire these missing records. We believe this process will assist CILHI in obtaining medical and dental records from civilian sources (next-of-kin and other family members, personal physicians, dentists, hospital records, etc.) as well as from military records repositories.

In addition, we were informed that the scientific staff was having difficulties in obtaining antemortem records located in the laboratory in a timely manner. Medical, dental, and other case information stored at CILHI must be made readily available to the CILHI scientific staff as needed during regular working hours.

**B. Describe and comment on CILHI's review procedures for remains identification.**

Properly implemented, the internal and external review process is sufficient to make misidentifications of human remains extremely unlikely. The system of checks and balances in the CILHI review process currently exceeds that of civilian forensic laboratories. Currently, CILHI's laboratory director assigns each new case to a CILHI staff scientist for initial analysis. If the analysis does not result in a recommended identification, the scientist recommends that the case be given pending status. If the laboratory director concurs with this determination, the case is formally given pending status, and is curated until further information or additional remains are received.

If, however, the initial analysis results in a recommended identification, the laboratory director assigns a scientist to conduct a peer review.<sup>10</sup> If the peer reviewer agrees with the initial analysis of the case, he or she submits the case for a supervisory review.<sup>11</sup> After the supervisory review, the laboratory director submits the case for a staff review.<sup>12</sup> If the staff concurs with the identification, a case file containing documentation

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<sup>10</sup>A peer review is the review of a case by another scientist within CILHI who was not previously involved with the case. A peer reviewer analyzes the remains independently of the initial scientist, and then compares his or her findings to the initial report.

<sup>11</sup>Supervisory review consists of a review of a case by the laboratory director or senior anthropologist. This supervisor reviews the case for completeness and soundness of the findings. The supervisor also resolves any differences between the assigned scientist and the peer reviewer. This review might not include any additional study of the remains.

<sup>12</sup>The staff review consists of a round table discussion by all of CILHI's scientists, CILHI's commander, and any outside scientists involved in the case.

necessary for an independent review is compiled by CILHI and forwarded to outside consultants for review. The outside consultants are scientists, who were hired by the Army, but are not regular CILHI staff. The Army asks these scientists to review the case files and either agree or disagree with the recommended identification. If the consultants agree with the identification the case is forwarded to the services who in turn present the findings to the next-of-kin. The next-of-kin have the option of either hiring their own independent scientist to review the identification or of accepting the identification and allowing the case file to be forwarded to the Armed Forces Identification Review Board (AFIRB). The AFIRB panel reviews the case file and either approves or disapproves the recommended identification. Upon the final approval of the identification, the remains are presented to the families for burial.

**(1) Is CILHI's review process properly implemented?**

Currently, CILHI's review process for recommended identifications is sufficient to make misidentifications extremely unlikely. However, we recommend that the peer review procedures also be applied to pending cases and recommended CIL-Portions. Currently, when a scientist makes a decision that remains cannot be identified, the case is archived pending the receipt of additional remains or information. A second opinion is not provided in these cases. While one scientist may judge a case to be unresolvable with current information, another scientist with different areas of expertise may know of techniques which may resolve the case. The identification process for pending cases and CIL-Portions would benefit from examination and/or periodic reevaluation by CILHI scientists who were not initially assigned to the case.

In addition, we recommend that the laboratory director make available peer review reports for the entire staff at or prior to the time of staff conferencing. Every member of the scientific staff should be required to initial a statement of agreement or disagreement with the identification conclusion before it is sent for outside review. This ensures that scientists with different levels and areas of expertise have reviewed the case, and concur with the conclusions.

**Outside Consultants' Review of Cases Is Not a True "External" Review**

The consultants, hired by the Army, provide two functions: (1) to review recommended identifications case files and (2) provide a semi-annual review of the operations of CILHI's laboratory.

The expectations of the consultants in reviewing the files are unclear. We could not determine whether the consultants are asked to (1) establish the reasonableness of the identification based on information in the case file, or merely (2) establish the reasonableness of the techniques used to establish the identification. We recommend that the Army establish written guidelines defining the role of the hired consultants.

The semi-annual visits by the senior forensic anthropologists and odontologist are valuable both for the peer review process and the professional growth of the CILHI scientists, and should be continued. If an additional, independent review of the completed case files of identification-recommended remains is desired, it should be performed by individuals other than the CILHI consultants. We recommend that the external consultants be chosen by the Department of Defense from a list of senior, board certified, respected scientists in their respective fields of specialization, but not necessarily excluding those individuals already acting as CILHI consultants. The assessment would then be a legitimate external review. Scientists chosen to perform either role should initially visit the lab and become familiar with its operation.

#### Outside Reviewers Sometimes Render Opinions Outside Their Areas of Expertise

In our review of the approved cases, we noted five cases in which either the anthropologist or odontologist rendered an opinion outside his/her certified area of expertise. It is axiomatic that forensic scientists should not render judgements leading to specific identification in areas outside their fields of expertise. We recognize that considerable overlap exists between the fields of forensic anthropology and forensic odontology, and that through knowledge, training and experience, expertise in a related field is attainable. Unless that expertise is demonstrated, we encourage CILHI scientists and reviewers to discuss all aspects of a case while it is being reviewed, but we recommend that they only offer written professional opinions within their field of expertise when it leads directly to a recommended identification.

#### (2) Are the case files adequately documented so that outside forensic experts can objectively review CILHI's recommended identifications?

Assuming that the case files reviewed at CMAOC are the same files offered to the Army's consultants for review, the case files were not adequately documented to establish the reasonableness of a recommended identification. In our review of the case files, we noted nine case files in which information necessary for an independent review of a CILHI identification was not included in the CMAOC files. For example, one case

states "Based on the left innominate morphology and overall muscular development, these are the remains of a male." If an outside reviewer is to judge the accuracy of this statement, either measurements or, preferably, photographs should be included to show the portion of the body discussed. In another case, long bone measurements were not available for the determination of stature. These measurements were present in the case file at CILHI, but not present in the file at CMAOC.

We recommend that the case files include the provision of all available observations, measurements (osteometrics), radiographs, and both color and black and white photographs appropriate to the specific identification. Specifically, we noted that although CILHI had excellent photographic capability, some photographs in the CMAOC case files as well as in the case files at CILHI are of less-than-diagnostic quality. Bearing in mind that the actual case specimen will not always be available for comparison, photographic case documentation must be produced (and copied for review) with sufficient detail and contrast and at the proper magnification for independent analysis to be achieved by an external consultant. To achieve optimal photographic representation for proper case documentation, we recommend that specimen orientation and subject magnification be directed in each instance by the CILHI scientist responsible for the case.

After an accurate and complete record is produced, an external consultant should be able to provide an objective opinion based on the relevant evidence contained in the case file. In the current situation, the Army consultants are invited to view the remains during CILHI site visits, so the case file is not the only resource used to confirm the identification. When a second opinion is sought (by the families, for instance), however, sufficient documentation may not be present in the case file for adequate assessment of the identification in question.

C. Are the qualifications and size of CILHI's scientific staff sufficient to meet the laboratory's identification mission?

Both the laboratory director and the scientific staff are qualified to perform skeletal and dental identifications. The laboratory director is qualified to manage the laboratory. We recommend that, upon her departure or retirement from the laboratory, CILHI hire a board-certified, civilian, forensic scientist for the position. This individual should have the academic credentials, administrative experience, and interpersonal skills necessary to demonstrate professional leadership at CILHI and to promote

an academic and collegial environment. A laboratory director should also foster mutual respect and cooperation between the scientific division and the military support staff. Additionally, the laboratory director should evaluate and offer suggestions relating to case work, stimulate professional growth of the scientific staff, direct its involvement with the research relevant to the mission of the laboratory, and foster cooperation with academic institutions throughout the country.

We noted that in numerous instances both the laboratory director or the senior anthropologist were deployed to the field at the same time. As a result, the identification process was not completed in a timely manner. We recommend that either the laboratory director or the senior anthropologist should physically be in the laboratory to supervise the ongoing identification process, and to be able to respond to administrative and other tasks (for example, family inquiries) on a timely basis.

In addition, we recommend that each member of the scientific staff be board certified as a condition of permanent employment.

#### Physical Anthropologists May Be Understaffed in the Future

The size of the anthropological and odontological staff is adequate to meet current caseload needs. However, this status could change with the anticipated acceleration of search and recovery excavations in Southeast Asia and elsewhere. If search and recovery efforts increase, CILHI will not have enough staff to concurrently employ physical anthropologists in the laboratory to continue the identification process and staff search and recovery efforts. In order to accomplish both tasks, CILHI will need to hire additional scientists. We recommend that an experienced physical anthropologist and archaeologist, each at least a doctoral candidate, be assigned to each excavation mission. CILHI could hire the additional scientists on an as-needed basis.

#### D. Are CILHI's facility, equipment, and library adequate to perform the laboratory's mission?

CILHI recently moved to a new facility specifically designed for its identification purposes. The laboratory space is minimally adequate for the scientists to perform the identification process. CILHI's scientific instruments (calipers, microscopes, and standard reference models for age determination) and dental examination equipment are adequate for current needs. However, the skeletal comparative collection is in need of repair and, in some cases, replacement. The laboratory's resources are enhanced by its ready access to external support, including staff and

equipment at Tripler Army Medical Center, the AFIP, the Smithsonian Institution, the University of Hawaii, and additional professional consultants.

Library resources at CILHI are outdated and incomplete. However, remedial and supplemental acquisitions are being sought. In addition to the standard library resources, we recommend subscription to a computer-based literature search system (for instance, Medline and Paper Chase) and access to electronic mail.

The fume hood and sink are minimally adequate for the present scope of duties at the laboratory. However, if recent civilian or military casualties are to be accepted by CILHI for identification, we recommend that CILHI install a larger fume hood, deep sink, and heating elements consistent with those found in other scientific laboratories with similar responsibilities. Finally, CILHI needs to enforce radiographic safety techniques.

Additional laboratory equipment could include portable writing table units with attached ring-magnifying and contrast lights. Also, CILHI could place borders on the tables and secure sheets to the table to decrease the possibility of creating artifactual damage to the specimens on the examination tables during the identification process.

E. What can CILHI do to improve its overall operations?

Records Need to Be  
Consolidated

CILHI initially separates all case file records into the following categories: circumstances of death, forensic anthropology, and forensic odontology. During the preliminary analysis, CILHI scientists receive only that information related to their area of expertise so that they remain unbiased by other information during the identification process. We recommend that, once all analysis is completed, CILHI merge these three categories into a single case file. In addition, this file should be permanently curated and contain all opinions, peer reviews, reports, observations, measurements, photographs, radiographs, and other supporting documents concerning those remains. No original supporting documents should be stored outside of the official file (we noted cases where the radiographs were stored in locations outside the official file). Release of materials from the files should be recorded in a log retained in the official file. Scientists may retain copies of materials from the files for research and instructional purposes, but all original materials should remain in the official files.

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**Radiographs Need to Be  
Maintained**

During our visit, we were informed that the current dental radiograph repository will be terminated concurrent with the establishment of a DNA specimen repository. Although DNA offers a potential advancement in identification, medical/dental records and medical/dental radiographs will remain a valuable resource for identification purposes into the foreseeable future. We strongly recommend that radiographs made for any purpose be archivally maintained for all military personnel.

**Updated Standard Operating  
Procedures Need to Be  
Developed**

Updated standard operating policies for both forensic anthropology and forensic odontology should be developed by the scientific staff and their respective consultants to provide uniformity of scientific protocol within the laboratory. The laboratory director should ensure implementation of these policies to maintain internal quality control.

**F. What miscellaneous observations, not covered in the preceding  
questions, can be made about the operations at CILHI?**

**Chain of Custody Is Not Always  
Maintained**

During our review, we noted several cases in which the chain of custody was not adequately maintained when the remains were sent to consultants, hired by the next-of-kin, for a second opinion. In these instances, third parties have raised concerns about the competency and integrity of CILHI's scientific staff. We believe that CILHI lacks appropriate procedures to ensure the maintenance of a chain of custody and to protect itself against these allegations. We strongly recommend that appropriate chain of custody protocols be implemented consistent with other medicolegal investigative agencies.

In this regard, we question the wisdom of CILHI's relinquishing the custody of remains or specimens for the purpose of obtaining an external opinion. We recommend, instead, that CILHI invite the expert providing the opinion to visit CILHI or another appropriately secured military facility for the purposes of examining the remains. If there are reasons that the remains must be transported to some other site, CILHI should deploy a military escort to stay with the remains for the duration of the examination.

**Retention of Unidentified  
Remains**

CILHI is limited both by the antemortem and postmortem material that is available for comparison. For example, in some cases a single fragment of tooth or bone is submitted, often from an undocumented source. Identification in these cases is extremely unlikely. Nevertheless, unidentified remains are being retained in the event that additional materials are recovered from the same source or that advanced identification techniques become available to make identification possible.



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We believe that these remains should continue to be properly curated and retained.

**Sometimes Unqualified  
Personnel Comment on  
Identification Cases**

Individuals who have not been trained in the forensic sciences, be they military or civilian, should refrain from commenting on a first-person basis and without proper attribution on the scientific aspects of any CILHI case. During our review, we noted five instances in which a person without the appropriate expertise in the laboratory or in the field commented on a case.

**CILHI's Scientific Staff Should  
Be Disassociated From the  
Military Chain of Command**

CILHI is a forensic scientific investigative agency whose primary responsibility is to identify human remains. Impartiality and the ability to make objective, scientific identifications without even the appearance of outside interference are essential prerequisites in an agency of this type. In those cases where coordinating the interpretation of forensic scientific findings with the circumstances of death or maintenance of chain of custody are relevant considerations, the agency's case handling responsibilities and their medicolegal ramifications are akin to those of a medical examiner's office. To ensure impartiality and objectivity, we strongly recommend that operational responsibilities at CILHI be separated into a scientific and a military component. All scientific personnel (in the laboratory and in the field) should be civilians, who report directly to the laboratory director.

**Forensic Pathology  
Involvement**

It is the opinion of some of GAO's consultants that because CILHI is a forensic scientific investigative agency, albeit with specialized scope and purpose, and because forensic pathologists are, by training and experience, responsible for synthesizing data from other scientific disciplines for identification purposes, forensic pathology involvement should formally be made an integral component of the identification process at CILHI, both in terms of active pre-identification case consultation as well as in the form of post-identification external case review. Forensic pathology involvement with the CILHI caseload would include interpreting postmortem findings pertaining to the identification process and in other matters where trauma pathology or issues of medicolegal significance may be relevant. To ensure CILHI continues its practice of forensic pathology consultation in its pre-identification cases, CILHI needs to include this requirement in its written operating procedures.

**Laboratory Director Needs  
More Authority**

We are concerned with the apparent lack of authority possessed by the laboratory director at CILHI, who is accountable for the completion of the professional responsibilities of the agency. The laboratory director should

be responsible for recruitment of scientific staff, academic involvement (education, training, and research) of scientific staff, timely acquisition of supplies and equipment, and enactment of improved identification procedures.

We have considered a number of options for increasing the authority of the laboratory director. These include:

1. Give the laboratory director equal status with the military commander of CILHI, and assign the laboratory director the final authority to make operational decisions about the scientific aspects of the laboratory.
2. Allow the laboratory director to report directly to the Assistant Secretary of Defense for Health Affairs on all scientific issues. This would administratively situate CILHI outside of the CMAOC system, a recommendation we would support, regardless of the ultimate configuration of the agency.
3. Transfer operational and administrative responsibility for CILHI to the Office of the Armed Forces Medical Examiner (OAFME) at the AFIP, while leaving CILHI at its present location and rotating the scientific staff through OAFME for in-service and other academic pursuits.
4. Abolishing CILHI and moving the entire CILHI operation to OAFME.
5. Placing CILHI under the control of the Department of Anthropology at the Smithsonian Institution. This is perhaps the least feasible of the options.

We believe it is beyond the scope both of our mandate and our expertise to make a specific recommendation in regard to the options listed here. However, while it is relevant to make an inquiry into the scientific proficiency of the CILHI operation, it is, in our judgment, equally important to resolve the broader parameters of long term agency oversight, stability and accountability.

# Other Areas of Interest to the Committee

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The Senate Select Committee on POW/MIA Affairs asked us to compile information in other areas. Some of these areas relate to matters previously aired in congressional hearings, and others deal with current events that could affect the identification process. Since our intention was simply to summarize this information for the Committee, we did not perform any in-depth analyses.

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## Accuracy of Identifications Prior to 1987

While CILHI has improved its identification operations since 1987 and has subsequently reduced the chances of making erroneous identifications, questions remain as to whether any erroneous identifications were made prior to these improvements. Many of the questions stem from the laboratory's recommended identifications of remains recovered from the crash of an AC-130 aircraft in Pakse, Laos, in 1972.

After remains had been recovered from the crash site in 1985, CILHI positively identified 13 crewmen on the basis of up to 50,000 commingled bone fragments. The Pakse controversy centered on the use of identification techniques not accepted in the scientific community. Some scientists who reviewed this case charged that in using scientifically unacceptable techniques, the Army had reached unwarranted conclusions about physical stature, sex, and age from the commingled bone fragments of these persons. The scientists determined that identifications for 11 of the crew were impossible to make scientifically. The Army later admitted that it had erred by making individual identifications rather than designating the remains for a group burial.

According to CMAOC records, 223 of the 381 individual Southeast Asian cases identified by the Army since 1973 occurred prior to 1987. During a December 1985 inspection of CILHI's operations, three consultants hired by the Army examined approximately 50 random cases from the 1982-85 time frame in addition to those known cases about which questions had been raised. With the exception of the Pakse aircraft crash incident, the consultants concluded that the identifications were valid.

In an October 1986 follow-up inspection at CILHI, these same consultants reviewed 75 approved cases and those in process at the laboratory at that time and were unable to detect any misidentifications. The consultants added that most of the cases were good, strong, or positive identifications based on dental X-ray comparisons, dental chart comparisons, and anthropological analyses.

We did not perform an in-depth evaluation of pre-1987 cases in our review because we believed it would be impractical to do so and any analysis would add little, if any, insight to what had already been disclosed. Further, Army staff who worked on these cases are no longer employed by the laboratory and were not available to provide necessary details. We did, however, discuss pre-1987 identifications with Army officials and reviewed selected case files on which questions had been raised.

CILHI officials acknowledged that several of their pre-1987 recommended identifications have been the subject of controversy, and they have had second opinions rendered by other forensic scientists. They added that there were two cases from the Pakse incident for which the Armed Services Graves Registration Office had withdrawn identifications after initially approving them. Even in these cases, however, it is very possible that the remains were actually those of the individuals originally identified. The rescissions were made because the identifications could not be supported by sufficient scientific evidence.

Army officials told us of the following two cases that were misidentified prior to the establishment of CILHI in 1976:

- In one case, a soldier who had been declared dead by the mortuary in DaNang, Vietnam, returned as a released POW during Operation Homecoming in 1973.
- In a second case, a set of remains was identified as an Army casualty by the Central Identification Laboratory in Thailand in May 1973 and was subsequently buried later that month. In 1989, CILHI received another set of remains that was identified by dentition as the same individual buried in 1973. Realizing that the laboratory personnel in Thailand had made an erroneous identification, the Army rescinded the 1973 identification and disinterred the remains. The next of kin accepted and buried the correctly identified remains, and the original set has been placed in pending status at CILHI as an unidentified case.

Our examination of the following selected pre-1987 CILHI cases, which have been subject to second opinions by scientists representing the next of kin, shows the different types of controversy that have arisen from the cases:

- The remains of one military person were identified by CILHI, accepted by the next of kin, and buried. The next of kin later learned that the remains did not contain any of the teeth on which the initial identification was supposedly made. The family asked that the remains be disinterred for

further examination by a forensic anthropologist, who stated that a positive identification could not be made without the presence of teeth. Subsequent to this examination, the initial recommended identification made by CILHI was substantiated through the use of DNA testing. As of July 1992, the remains were at a funeral home designated by the next of kin.

- An aircraft crashed while on a combat mission, resulting in multiple deaths. The next of kin of one of the casualties questioned CILHI's recommended identification because it was based on a single tooth. The next of kin hired a consultant to provide a second opinion, and he agreed that the tooth was from the person identified by CILHI. The remains have been interred by the next of kin.
- In another case, the next of kin believed that their relative had not died when his aircraft was shot down. They contended that he had been seen in Southeast Asia and had a picture as proof. However, the photograph has since proven to be of another person. Nonetheless, the remains have been exhumed and reanalyzed several times since their initial processing at a U.S. Army mortuary in Vietnam. One examination, performed by an anthropologist selected by the next of kin, showed that the remains were consistent with the information in the medical records but not with information provided by the family. As a result, he claimed it was not a positive identification. Although the initial identification had been made by a U.S. Army mortuary, CILHI examined the remains and stated that the findings used to make the identification were consistent with the information in the casualty's medical records and the circumstances surrounding the incident. CILHI believes the decision for a recommended identification was valid.
- The next of kin doubted CILHI's recommended identification of the remains of a crew member involved in an aircraft crash. The next of kin hired a consultant to examine the remains, and he said the remains were insufficient to make a positive identification of the individual. Upon reevaluation of this case, the Armed Services Graves Registration Office agreed and rescinded the identification. As of July 1992, the remains were still in the care of the service.
- The next of kin of a deceased crew member hired an anthropologist to reexamine remains that had been transferred from the military to the family. The anthropologist told the family that a positive identification could not be made on the remains. DOD stated that CILHI's identification of the remains was based on a consideration of all available information. Further, DOD said that the evidence presented by the independent anthropologist did not warrant a change in status. The remains have since been accepted by the family.

## Efforts to Identify Remains Repatriated in April 1989

In April 1989, the Vietnamese government repatriated one set of remains that, unlike other remains entering the laboratory, exhibited a foul odor and had some tissue adhered to the bone. Although the remains were virtually a complete skeleton, including dentures, CILHI scientists, as well as several other forensic experts, have been unable to identify them. Because the remains were so complete and appeared to be those of a more recent death, the case has drawn considerable interest. The Senate Select Committee on POW/MIA Affairs held hearings on this case in November 1991.

CILHI officials told us that they have exhausted all available scientific techniques in their attempt to identify the remains. CILHI scientists have been able to determine that the remains are those of a male approximately 50 years old, 71.5 inches tall, and of Negroid and/or Indian ancestry. The Vietnamese have told CILHI officials that the remains are those of an individual who had been in a Vietnamese hospital and died in 1975. Without additional information, however, the CILHI scientists are not optimistic that an identification will be made. They indicated that the remains and the set of dentures accompanying them do not match any of the MIAs they have on record. The following summarizes CILHI's efforts to identify these remains:

- Six independent anthropologists have examined the remains and have not been able to add any information.
- CILHI representatives have asked the Vietnamese government four to six times to provide additional information on the case, with no success.
- The Armed Forces Institute of Pathology has been successful in extracting mitochondrial DNA from the remains. However, because a name is not associated with these remains, CILHI cannot identify a maternal relative from whom to collect DNA for identification purposes.
- CILHI has sent the dentures to three different laboratories for analyses of the materials used in the preparation of the dentures. As of July 1992, two laboratories could not provide any additional information, and one laboratory had not yet finished its analysis.
- An orthopedic surgeon examined the remains and determined that the cause of death most likely was damage or injury to the spinal cord.

## Warehousing of Remains

According to Defense Intelligence Agency officials we interviewed, there is some indication that the Vietnamese are currently storing hundreds of American remains. They believed that the Vietnamese government has deliberately warehoused the remains of missing Americans and has

periodically repatriated them to the United States to its political advantage. Until recently, the Vietnamese government has repeatedly denied these allegations.

While the possible storage of remains is a subject of debate, CILHI officials we contacted have seen signs of the long-term storage of some of the remains they have received in the laboratory. As of March 1992, of 108 cases in the laboratory that had been repatriated by the Vietnamese government, CILHI scientists had identified 28 that showed evidence of having been kept in storage. According to these scientists, many of the remains have been sprayed with preservatives in a probable effort to protect them while in storage. CILHI scientists also noted other instances in which remains had been sanded in an effort to remove chemical residue. In 1992, Vietnamese government officials admitted to CILHI that they had stored remains. CILHI officials said that private citizens might have stored them and turned them over to the government.

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## Determination of the Dates of Death

According to CILHI scientists, no valid scientific, analytical method exists for estimating, with any great precision, the dates of death for remains received in the laboratory. In many cases, CILHI can estimate the age range of an individual at the time of death through its anthropological analysis. However, CILHI scientists told us that their examinations of received remains have not revealed any cases in which they believed the individual died after 1975.

We examined CILHI's summarized listing of missing personnel from Southeast Asia and found no evidence of incident reports after 1975. CILHI has information gathered from external sources such as the Defense Intelligence Agency on possible dates of death for missing personnel from the Vietnam conflict. CILHI's casualty data analysts maintain information on each U.S. service member who is listed as killed or missing in action but whose body has not been recovered. This information includes the date and place where an incident, such as a plane crash, occurred and when and where the individual was last sighted. In addition, the Vietnamese government or individual will often provide, along with the remains, an estimated date when the individual is alleged to have died; however, the credibility of this information is subject to debate.

The following is a brief summary of two publicized cases in which the alleged dates of death of CILHI-identified remains have been questioned by the next of kin and/or consultants representing the next of kin. We

obtained the data by interviewing CMAOC officials and researching the case files in question.

Nature of the controversy: The decedent's family believes that the decedent's date of death was later than that found in CILHI's records. The family, by obtaining a second opinion from a private forensic anthropologist, alleges there was no evidence in the remains of trauma caused by such a crash. CILHI, however, believes that the individual died in 1972. Its subsequent analysis of the remains produced no evidence to suggest a different date of death than that already established.

Nature of the controversy: The decedent's family believes that the date of death was later than that shown by CILHI's records. As supporting evidence, sand was found in the skull of the remains. The family alleges that it was sand from a beach, indicating that the decedent had lived through the crash and was a POW for some time following the incident. CILHI's subsequent analysis produced no evidence to suggest a different date than that already established. Upon examination of the remains, CILHI scientists indicated that the sand could have come from various sources, such as a packing crate, and have no reason to believe that the individual survived the crash.

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## Additional Efforts to Account for Missing Personnel

The Army, in conjunction with the JTF-FA, is attempting to not only recover more remains through search and recovery missions in Southeast Asia but also to obtain additional information on remains that are in a pending status at CILHI. These efforts contribute to JTF-FA's mission to obtain the fullest possible accounting of personnel missing in Southeast Asia.

CILHI, in addition to participating in U.S. search and recovery missions in Southeast Asia, participates with the JTF-FA in technical conferences with Southeast Asian governments. From 1981 to 1991, U.S. officials met with Vietnam officials on approximately 20 occasions seeking to resolve POW/MIA issues. During this period, CILHI and the JTF-FA (or its predecessor agency—the Joint Casualty Resolution Center) participated in 32 technical meetings between the two governments for the purposes of (1) obtaining additional information on remains previously repatriated and (2) resolving “discrepancy cases.”<sup>13</sup> However, CILHI officials told us that the Vietnamese government's responses to U.S. inquiries have been slow, inadequate, and largely unsuccessful. In this regard, CILHI and JTF-FA officials have

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<sup>13</sup>“Discrepancy cases” are cases in which the circumstances of loss suggest the individual survived and was likely captured, yet the Vietnamese have repatriated neither the person nor the remains.



expressed concern that as time passes, it is becoming increasingly more difficult to resolve cases because of the deterioration and loss of remains and evidence needed to assist in the identification process.

CILHI officials are optimistic that with the increased resources and importance now being given to the resolution of POW/MIA issues, the Vietnamese, the Laotians, and the Cambodians will be allowing greater access to places, records, and people who can provide the needed information. For example, the Laotian and Vietnamese governments' easing of access restrictions into their countries has resulted in an increase in the number of JTF-FA's and CILHI's investigative and search and recovery missions in 1992. In addition, for the first time, the Cambodian government is allowing U.S. search and recovery teams into the country.

CILHI also has attempted to get more information on remains by hosting meetings with Vietnamese, Laotian, and Cambodian delegations. For example, in April 1992, a delegation of Vietnamese officials and scientists visited CILHI to discuss the resolution of 101 repatriated cases. CILHI officials told us that the Vietnamese officials had agreed to actively search for additional information on about one-third of these cases for which the prognosis for identification was good. CILHI and Vietnamese representatives plan to meet later in the year to discuss the results.

In hopes of obtaining additional background information on the remains of U.S. missing personnel, CILHI officials recently interviewed a mortician who worked for the North Vietnamese government. Defense Intelligence Agency officials told us this individual claimed that prior to 1978, he had personally worked for the North Vietnamese government on hundreds of bodies of U.S. service members. Because of the preparatory work he performed, this individual believed he could distinguish his work from the work of other morticians, thus providing a time frame as to when remains were processed in Vietnam.<sup>14</sup> This person also claimed that he had seen remains of U.S. service personnel warehoused in North Vietnam. Unfortunately, his meeting with CILHI officials did not provide any information considered useful for identification purposes.

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## Tenure of CILHI's Commander

Over time, critics of CILHI have questioned the lengthy tenure of the current CILHI commander and have alleged that he has exerted undue pressure in

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<sup>14</sup>Vietnamese burial practices consist of the immediate interment of a body and its disinterment after 2 or 3 years. A mortician then removes remaining tissue and may apply chemical preservatives before turning the remains over to the family for final burial.

influencing or altering identification decisions. The current commander, an Army lieutenant colonel, has been at CILHI since July 1982.

The Army has consistently supported the CILHI commander in his present position. In 1987, for example, the Army's Vice Chief of Staff directed that he be extended in his present position and that further extensions be reviewed on an annual basis. The commander's tour has subsequently been renewed on several occasions. According to the Commanding General of the U.S. Total Army Personnel Command, the commander has been retained because of his unique skills, knowledge, ability, and experience. According to a CMAOC official we interviewed, the commander's continued presence in the process of attempting to obtain full accounting for MIAs is critical because of (1) the rapport he has developed with Southeast Asian government officials in technical meetings and (2) his interactions with families of MIA personnel and his familiarity with individual cases.

We found no evidence to suggest that the current commander's presence has had a negative impact on remains identification operations. CILHI scientists we interviewed were supportive of the commander, and our review of identification documentation showed no signs of alterations by the commander. Further, critics we interviewed were unable to produce specific examples of the commander's alleged pressuring of CILHI scientists to unjustifiably alter their judgments or revise their work on identification cases.

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## Recent Resignations of Key Scientific Staff

CILHI's laboratory director resigned effective September 18, 1992, and the senior anthropologist is planning to resign in late October 1992. The laboratory director cited several managerial and administrative problems at CILHI as reasons for her resignation. The senior anthropologist is resigning to further her career but acknowledges the existence of the problems cited by the laboratory director.

On the basis of interviews with these two individuals; with CILHI's commander, executive officer, and acting laboratory director; and with the commander of the JTF-FA, we believe that some of the problems cited can be attributed to miscommunications or misunderstandings between the resigning anthropologists and CILHI and JTF-FA officials on the nature and extent of what the problems are and what is needed to resolve them. For example, the laboratory director perceived the use of weekly status reports, or "scorecards," as requested by the JTF-FA commander as pressure

to produce identifications. On the other hand, the JTF-FA commander indicated that he saw these reports as management indicators of the progress being made to achieve more accountability of missing personnel. CILHI officials acknowledged that several of the problems cited needed attention and said that action had already been taken or was planned to correct them.

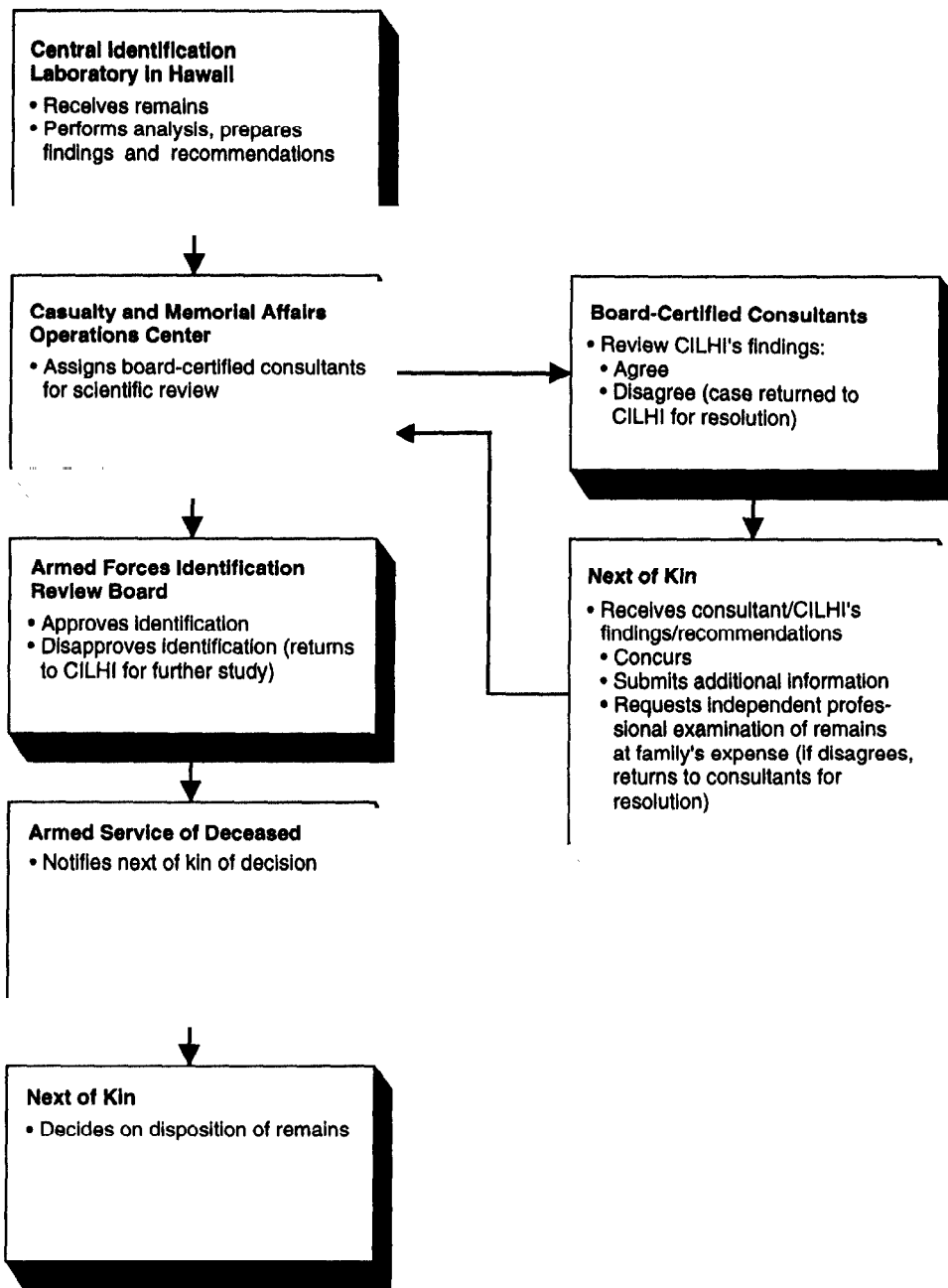
Although these staffing changes could have an impact on the timeliness of identifications until CILHI hires replacements for its senior scientist positions, it is important to note that both resigning individuals told us that the existing checks and balances in the system, most notably the external review process, will prevent erroneous identifications from being made and that the integrity of the scientific identification process will not diminish with their departure.

In the interim, CILHI's senior odontologist was appointed as acting laboratory director until the Army hires a replacement. The Army is actively seeking qualified scientists to replace the resigning ones. It is hoping to hire a board-certified anthropologist for the laboratory director position. As of early October 1992, a new laboratory director had not been hired.

These resignations provided the impetus for an evaluation of CILHI by the Army's Office of the Inspector General that began in September. The Inspector General's Office is examining CILHI's organization and resources and its relationships with other organizations, such as JTF-FA, to ensure that CILHI can achieve its current and future mission. It expects to issue its report around November 1992.

# The Army's Procedures for Identifying Human Remains From the Vietnam Conflict

**Figure III.1: Identification Process for Remains of Unaccounted for Americans From Vietnam Conflict**



The identification process, as shown in figure III.1, begins with the recovery or return of remains. CILHI receives remains through three sources: (1) foreign governments, which recover and officially repatriate remains to U.S. custody; (2) U.S.-sponsored search and recovery missions; and (3) unofficial friendly sources or refugees.

After CILHI receives the remains, an anthropologist and odontologist independently attempt to identify them using standard, recognized forensic techniques and procedures. First, the scientists try to separate commingled remains. Next, the anthropologist and odontologist examine the remains and document all dental and biological/medical data onto a series of charts, forms, and special narratives. The scientists attempt to determine the age, race, sex, muscularity, height, dental features, and indications of injuries the person might have sustained in the conflict or abnormalities that might have existed while the person was alive.

The quality of the remains must be adequate to compare them to existing records. Before an identification can be made, the comparison must be unique enough to exclude all other possibilities. For example, the skull, face, and hip area bones are very important for determining age, sex, race, and body build. Scientists also look for unique qualities that may identify the remains as belonging to a specific individual. For instance, if the remains show a healed bone fracture, the scientists can check the antemortem medical records of a prospective individual to see whether his or her past records reflect the same injury. Teeth are usually regarded as the best type of remains for identification because they have a number of unique characteristics such as their placement in the mouth and the number and size of restorations. From January 1987 to March 1992, CILHI recommended the identification of 156 of 158 Vietnam conflict cases on the basis of the characteristics of the persons' teeth.

If teeth are received with the remains, the odontologist examines them and documents all restorations and unusual characteristics. These findings are entered into the CAPMI system—a computer program that has in its data base the antemortem dental records of most unaccounted for personnel including those from the Vietnam conflict. The CAPMI system compares the characteristics of the recovered dental remains with the data base and generates a list of the most likely candidates for a match. The odontologist then compares the antemortem dental records of the individuals listed by the CAPMI system with the actual remains and the postmortem X-rays to try to establish an identity.

Using available technology and their own professional experience, the scientists estimate the physical characteristics of the person associated with the remains. Next, the scientists compare this estimate to a set of missing individuals with similar traits in an attempt to get a possible match. CILHI's casualty data analysts collect and maintain records in the form of personnel, medical, and dental files on U.S. service members and civilians who are unaccounted for from past conflicts.

If the scientists are unable to recommend an identification due to insufficient remains or information, the case is held until additional remains or information can be obtained, or the remains are designated as a "CIL-portion" and stored indefinitely.

If a favorable comparison is made, the laboratory director will assign another scientist to review the case for errors in judgment, analysis, or anatomical placement of bones. After the review has been completed, the laboratory director or senior anthropologist compares the peer reviewer's results to the original findings, resolving any discrepancies between the two reports. At the internal staff review meetings, each of CILHI's scientists has the opportunity to express his or her professional opinion on the case. If the identification is agreed upon, CILHI forwards the case file, including its recommendation and supporting documentation, to CMAOC.

CMAOC contracts the services of three board-certified forensic scientists, normally two anthropologists and one odontologist, to review CILHI's findings and recommendations. These Army consultants review the case files and have the option of examining the remains for which the identification is recommended. Each consultant prepares a written evaluation and includes it in the case file. If any of the consultants disagree with the recommendation, the case file is returned to CILHI for further resolution. Once all areas of concern are addressed, CILHI resubmits the case file to the Army consultants. If all the consultants agree with the recommendation, the case file is forwarded to the deceased person's military service.

Upon receiving the case file, the deceased person's military service has a representative notify the next of kin of CILHI's recommended identification of the remains and the Army consultants' evaluations. The next of kin have three options: (1) to concur with the findings, in which case the recommended identification and accompanying case file are submitted to AFIRB for review and action; (2) to submit, within 30 days of receipt of notification, additional written information to be included in the case file;

or (3) to request an independent professional examination of the remains at their personal expense. If the family's independent consultant disagrees with CILHI's findings and recommendation, the case file is returned to the Army's consultants for resolution.

At the conclusion of one of the three options, AFIRB has 7 days to either approve or disapprove the recommended identification based on a majority vote. The board consists of a primary or alternate voting member from the Army, the Navy (or Marine Corps), and the Air Force (at the O-6 officer level or a civilian in the grade of GM-15 or higher), with only one member from each of the three services allowed to vote. Approval of an identification is based upon all relevant facts and circumstances, including anthropological evidence, intelligence reports, witness statements, and any other information relevant to the loss of a service member and the recovery of remains. The lack of conclusive anthropological evidence does not preclude CILHI from recommending or AFIRB from approving a recommended identification in a case in which the evidence, taken in its entirety, supports an identification. If AFIRB disapproves the recommended case, the information is returned to CILHI for further study.

After AFIRB has approved an identification, the case is forwarded to the appropriate service which is responsible for returning the remains to the family and for their final disposition.

A request by the next of kin for reconsideration of an AFIRB-approved identification is granted only on the basis of newly discovered evidence not previously considered by AFIRB. Such requests are forwarded with the case file to the respective service for an evaluation of the new evidence.

# 1985 Army Consultants' Recommendations on CILHI Operations and Army's Response

<b>Recommendation</b>	<b>Army response</b>	<b>Current condition (as of July 1992)</b>
Positive identification should only be applied to cases with direct fingerprints or serological or radiographic comparison between X-rays.	Concur	Continued concurrence with recommendation.
Unidentified commingled, fragmented remains should be presented as such and recommended for mass burial.	Concur	Continued concurrence with recommendation.
A nationally or internationally known forensic anthropologist should be hired to direct the laboratory.	Concur	A nationally known anthropologist is the current director.
The laboratory supervisor should be retained as senior anthropologist.	Concur	The laboratory supervisor died in 1988.
A competent dentist, with training in forensic odontology, should be hired for the laboratory.	Concur	Two forensic odontologists are on the staff.
The addition of one or two identification specialists would increase the pace at which remains could be processed.	Concur	Six full-time anthropologists are on the staff.
A photographer and radiographic technician should be added to the staff.	Concur	Two photographers are on staff, and Tripler Army Hospital provides radiographic support.
It would be helpful to have a full-time antemortem records investigator on the staff.	Concur	Seven full-time casualty data analysts are on the staff.
The Armed Services Graves Registration Office's review board would benefit from the addition of two forensic anthropologists, two forensic odontologists, a lawyer, and forensic pathologists.	Concur	Two forensic anthropologists and one forensic odontologist review every recommended case file and provide guidance to the review board (now AFIRB).
All scientists should be encouraged and financially supported to attend appropriate scientific meetings on the mainland.	Concur	All scientific staff are financially supported to attend two scientific meetings of their choice per year.
With regard to the Pakse incident, CILHI acceptably identified the remains of two cases, and there is no reason to doubt the other identifications. Families of the deceased should be apprised of the situation and asked their wishes in resolving it. Any remains the families do not accept should be given a mass burial.	Concur	Of the 13 individuals involved in the Pakse incident, 11 identifications have been approved, and 10 have been accepted by the families. Two of the identifications have been rescinded.

(continued)



**Appendix IV  
1985 Army Consultants' Recommendations  
on CILHI Operations and Army's Response**

<b>Recommendation</b>	<b>Army response</b>	<b>Current condition (as of July 1992)</b>
A new building should be constructed to include a larger space for the science laboratory, adequate space for the records room, separate X-ray room with X-ray machine and "dry copy" processing capability, and a good photographic darkroom.	Concur	In July 1991, CILHI moved into a new facility specially designed for the identification process.
A professional reference library needs to be created.	Concur	The library has not been kept current and needs improvement.
A modern dental X-ray unit, such as a Faxitron, should be purchased.	Concur	CILHI has both a modern dental X-ray unit and a Faxitron.
Each scientist should have a computer, a printer, a 35mm single lens reflex camera, strobe lighting, and a stereo microscope.	Concur	CILHI is in the process of purchasing computers for each scientist. Other listed equipment is available to CILHI scientists.
The laboratory should have one stereo dissecting microscope on a rolling stand.	Concur	The laboratory has the microscope, but it is not on a rolling stand.
There should be a bank of X-ray viewboxes on wheels and at least one X-ray viewbox on each anthropologist's desk.	Concur, but not needed for each desk.	CILHI has equipment but not one on each scientist's desk.
Field stretchers should be replaced by hospital gurneys or body tables.	Concur	The new facility has body tables.
The laboratory should contain higher, flatter sinks to facilitate the washing of skeletal remains.	Concur	The new facility has a higher, flatter sink.
Additional forms should be present in each case file to (1) document how stature was estimated (with actual measurements) and (2) index what is located in each file, including whether original X-rays on teeth, fractures, and chest were examined.	Concur	Documentation is now included in the files on how stature is estimated. Currently, the content of the files is indexed only when a final disposition has been made on a case.
CILHI should have an X-ray duplicator.	Concur	CILHI has an X-ray duplicator.
An anthropologist should accompany the search and recovery team.	Concur	Currently, an anthropologist accompanies each search and recovery mission team.
To avoid misunderstanding, a separate narrative summary that mentions only the material associated with a body should accompany each case.	Concur	CILHI's narrative summaries contain this information.

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# Major Contributors to This Report

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**National Security and  
International Affairs  
Division,  
Washington, D.C.**

Henry L. Hinton, Associate Director  
Kenneth R. Knouse, Jr., Assistant Director  
James R. Reifsnyder, Evaluator-in-Charge  
Laura L. Talbott, Senior Evaluator  
George H. Shelton, Senior Evaluator  
Keith N. Burnham, Evaluator

---

**Far East Office**

Peter Konjevich, Regional Assignment Manager  
Marvin E. Hanson, Site Senior  
Robert E. Sanchez, Evaluator

---

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