IDENTIFICATION OF MISSING INDIVIDUALS FROM BOSNIA AND HERZEGOVINA USING MITOCHONDRIAL DNA ANALYSIS

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Mitochondrial DNA (mtDNA) can play a significant role in the identification of skeletal remains recovered from past military conflicts and in the identification of biological specimens collected from crime scenes. The role of mtDNA in a forensic investigation can vary depending on the circumstances in the case. In this particular case, mtDNA analysis was used to help identify missing individuals from the former Yugoslavia.

Since its foundation in 1948, Yugoslavia has been proceeding through a process of democratization and liberalization, though it retained the Communist aspects of one party rule. Beginning in the 1980's, the republics of Slovenia and Croatia had initiated further economic and democratic reforms. However, Slobodan Milosevic, head of the Serbian Communist party, and his supporters were concerned with the possibility of the spread of this reform to the rest of Yugoslavia. In 1991, Slovenia seceded from the Federal Republic of Yugoslavia. This bloodless revolt encouraged some to believe that the independence movement in Yugoslavia would not initiate a civil war. Soon after, Croatia began its secession and in 1992 Bosnia and Herzegovina (BiH) followed suit. During this revolt, Croatia had several thousand people die. Between 1992 and 1995, BiH had just under 300,000 people die. It is estimated that 30,000 individuals are missing. In fact, during a five day period in July 1995 between 7,000-10,000 Muslim men went missing when Srebrenica fell to opposing forces. It was the largest mass casualty incident in Europe since WWII.

Many of the unknown remains have been assigned an identity using traditional (non-DNA) human identification techniques. A significant number of cases will require DNA testing to help establish identity. Currently, in BiH, there are 6,000-8,000 sets of recovered remains that will require DNA testing. It is estimated that as many as 20,000 skeletal elements and 100,000 blood references may require DNA testing. The International Commission on Missing Persons (ICMP) is establishing or upgrading forensic DNA laboratories throughout the former Yugoslavia to perform this testing and collecting blood samples from the families of the missing persons. Until these laboratories are functional, the ICMP is sending presumptive identification cases out-of-country for DNA analysis.

In April-May 2000, AFDIL received 16 bone samples from the ICMP from the Srebrenica region. Maternal reference samples were also sent along with the bone samples. Mitochondrial DNA analysis was performed on all bone samples and references. Fifteen of the sixteen bone samples produced complete sequence data in Hypervariable Regions I and II. Only one sample produced inconclusive sequence data. In August, AFDIL was able to report that mtDNA profiles obtained from nine of the bones were consistent with the associated reference and that five of the bones were not consistent with the associated reference. The ICMP was able to present these findings to the families.

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