



# PHYSICIANS *for* HUMAN RIGHTS

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## **Forensic Monitoring Project Report Hrgar, Jama-Bezdan Exhumations of the Bihac Expert Team (1 September - 5 October 1997)**

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### **I. PROCESS**

#### Summary of Events:

The exhumation and identification process at the mass grave site of Hrgar, Jama-Bezdan began on Monday, 1 September and was completed on Saturday, 4 October 1997. The exhumation and autopsies were conducted by the Unsko-Sanski Canton's expert team, which consists of Crime Technicians and Inspectors from the Bihac police, Bihac pathologist Dr. Samira Mesic, and members of the local court. Dr. Tal Simmons, the Director of the Forensic Monitoring Project for Physicians for Human rights (PHR) assisted in the removal of the skeletal remains from the cave from 2-11 September. Work in the cave was halted several times due to the discovery of unexploded ordinance under the skeletal remains and garbage, and once after a policeman slipped and fell. The autopsies were carried out from 16-30 September by Dr. Mesic with the technical advice and assistance of Dr. Simmons and a PHR team of pathologists and anthropologists from the United States and Turkey. All the victims were males, between the ages of 14-65 years. The most frequently recorded cause of death was multiple gunshot wounds.

Names were associated with 45 of the individuals exhumed from the cave. The operation concluded on 5 October with a funeral service held in the center of Bihac for all the victims recovered from the cave.

## Site Description Overview:

Hrgar is a mountainous limestone region located just southeast of the village of Ripac. The mass grave of Jama-Bezdan is a natural vertical cave shaft that is still actively forming and increasing in depth. Trees and other vegetation surrounded the shaft and grew along its walls to some depth. At present the cave shaft is between 2-3 m wide and extends some 80 m in depth to a muddy bottom (Figure 1). The cave "floor" is roughly rectangular, and approximately 4 x 7 m in area, with one narrow, tall crevice and one wide, low antechamber extending from the main area (Figure 2). The walls of the cave shaft are relatively dry in the upper half, but water runs freely down one side of the shaft from this point. One wall of the cave itself is continuously running with water and water drips heavily and steadily from other points in the "ceiling." Light adequate to visual exploration does not reach the cave floor. The ambient temperature inside the cave held steady at approximately 3-4 degrees Centigrade.

The cave had been used as a garbage dump for many years which created a talus cone of deposits on the cave floor. The area directly under the opening contained the deepest deposits and was the highest point on the cave "floor." The garbage consisted largely of tires and inner tubes, shattered glass bottles, plastic containers, expired license plates and identity cards, animal carcasses, leather army belts and web gear, a variety of rusted firearms and unexploded ordinance, etc.

The more recently deposited (relative to the majority of the garbage) human remains had, when thrown into the cave, rolled downhill to the lower sides and far reaches of the cave bottom, and in a few instances into the small antechamber. Bodies were frequently "stacked" and/or "tangled" in these lower areas along the cave sides and at the base of the talus cone. Almost no articulated remains were found near the top of the deposit. It appears that, as decomposition occurred, skulls and other body parts also rolled downhill and became separated from the rest of the body. In several more clearly articulated bodies, skeletal remains in clothing found on the slope of the talus cone appeared to be "stretched out" beyond their actual height.

Nearly all the remains were completely skeletalized due to the action of water in the cave for the five years since their deposition. The fauna of the cave (nematodes of several species, rodents, etc.) contributed to the decomposition process as well. A relatively few bodies (approximately 3-5) contained significant amounts of adipocere and in some cases recognizable muscle tissue. Only one case retained a desiccated brain and another retained some organ structure (the diaphragm and intestinal mesentery were distinguishable).

## History relating to the Mass Grave:

Local authorities believe that the human remains at Jama-Bezdan are those of Muslims who were held in the Ripac concentration camp in July of 1992. On 11 July 1992, a number of concentrations camp inmates were believed to be released, but those that remained behind were never seen alive again. Numerous cartridge casings from 7.62 ammunition were recovered from the forested area immediately surrounding the opening to Jama-Bezdan. This is consistent with the victims being shot at the site prior to being thrown into the cave shaft. The cave walls show



evidence of craters caused by grenades exploding within the cave.

Local authorities (Mr. Esad Bajramovic and Judge Adem Jakupovic) related that information regarding the use of Jama-Bezdan as a mass grave had come from "registered Serb prisoners" held during the war. It was hinted that, during several other more recent meetings with Serb informants in the Republika Srpska, additional information including lists of prisoners from the Ripac concentration camp killed at the site had been provided. No such lists were available when requested, however.

#### Exploration of Hrgar:

Local authorities agree that planning for the exhumation at Jama-Bezdan began on paper in June of 1997. At this time, however, no exploration of the site had yet occurred, nor had authorities located with certainty which of three known cave shafts was the site that the Serb informants had identified as the mass grave. Nonetheless, the date for beginning the exhumation was set for 1 September.

In early August of 1997, Ermin ("Lipa") Lipovic, a Krim. Inspektor for the Bihac police and an amateur climber and caver, descended into Jama-Bezdan with a camera and video camera. He photographed and videotaped both the descent into the cave shaft and features of the cave floor. It was clear from both the photographs and the videotaped record that numerous human skeletal remains and remnants of clothing were present on the cave floor. Two additional nearby cave shafts were located in the Hrgar area and similarly explored, both by Lipa in August as well as a team of mining engineers in September of 1997. Neither site proved to contain any human remains.

#### Planning:

In late July, Amor Masovic (President of the Federation's Commission on Missing Persons) presented PHR with a list of supplies and equipment requested by the Bihac Expert Team for the Hrgar exhumation. This was the first time that PHR was advised of the existence of the site and plans to exhume it. PHR's Forensic Logistics and Needs Assessment Project Coordinator, Ms. Molly Ryan, placed an order for the disposable supplies requested, including rubber boots and gloves, Tyvek disposable suits, etc. In addition, supplies ordered for other Expert teams were marked for diversion to be delivered to Bihac: aluminum tags, trowels, body bags, etc. On 1 September, Tal and Molly delivered body bags, Tyvek suits, trowels, chopsticks, etc. to Masovic in Sarajevo for the Bihac team. Additional supplies, including autopsy kits, comparative casts for the estimation of age and sex, rubber boots and gloves, were delivered by Molly directly to Judge Jakupovic on 9 September.

Tal Simmons of PHR visited the site on 7 August 1997 with Amor Masovic, Esad Bajramovic (Bihac area representative to the Federation's Commission on Missing Persons), Hasan Pjanic (Judge, Bihac Court), Ermin Lipovic, and others. At this time, she noted numerous 7.62 shell casings around the opening to the cave and several grenade pins. Tal discussed the exhumation with these individuals and urged them to plan to begin on 15 September, or 8



September at the earliest, and not 1 September, as supplies ordered by PHR specifically for this exhumation would not arrive in BiH until the second week in September. No mention of specific plans (described below) was made by the local officials at this time. Masovic was clearly lobbying PHR for all supplies, including generators, wet suits, etc. In addition, Masovic showed Simmons the cave-shaft site of Laniste (near Kljuc) and some of the equipment used. He had exhumed 185 bodies from that site the previous year.

#### Demining:

The preparations for the exhumation and identification work at Jama-Bezdan, undertaken by the BiH Army's 5th Corps, began around the third week in August 1997 and were concluded within 15 days. At this time, the site was de-mined by members of the BiH Army's 5th Corps; according to local informants involved in the exhumation (soldiers, police, judges, etc.) this process was completed in a single day. A perimeter was established and marked in white flagging tape with the universal symbol for mines at intervals along it. The cave itself did not, at this time, undergo a demining process.

#### Preparation of the Site:

The site was transformed by the 5th Corps over the next 14 days. It is unknown whether the police criminal investigators searched the area thoroughly for evidence (shell casings and grenade pins, noted above) or whether any evidence was collected, documented, or mapped. All trees surrounding the cave shaft were cleared with a bulldozer, gravel roads were created into the area of the cave, an extensive covered wooden platform was constructed over the opening to the cave. In addition, large canvas army tents were erected to house the recovered bodies, the on-site morgue, the identified and the un-identified bodies, the electrical generators, meeting areas, and changing areas. Latrines were dug for men and women. Generators loaned from ICRC were installed and a winch mechanism was placed to operate a cable which lowered a covered metal cage into the cave. An army and police checkpoint was established at the site entrance on the main road.

With the exception of standard construction-site hard hats, safety equipment and mechanisms were not in place prior to the beginning of the exhumation, nor did they appear to be a priority consideration for getting the recovery operation underway nor for its continuance. There was no back-up to any equipment for the winch-pulley-cable system operating the metal cage lift by which members of the exhumation team descended and ascended from the cave. Only two sets of climbing harnesses with karabiners existed (the personal property of Ermin Lipovic) for personal safety back-up equipment; these were worn by Lipa and Tal. An ambulance and its crew were standing by during most days of operation, but these personnel knew little first aid and the ambulance contained inadequate supplies. It is unknown whether the ambulance and its crew were on site specifically to deal with the exhumation crew and potential accidents and injuries to them, or as support for distraught family members visiting the site.



## Recovery of Remains:

Recovery of remains from the cave by members of the Bihac expert team led by Ermin Lipovic began on 1 September. Initially, no other members of the expert team except for Lipa were willing to work within the cave due to fear (see report of post-exhumation meeting with expert team). In two days work, 1-2 September, a large quantity of garbage and four bodies were recovered from the surface of the cave floor and brought to the ground surface.

On the morning of 2 September, Tal Simmons and Molly Ryan delivered the supplies ordered for Bihac to Amor Masovic in Sarajevo, as he was planning to visit Bihac the following day with a vehicle large enough to transport them. On the evening of 2 September, Tal Simmons and Laura Bowman (Deputy Director, ICMP) visited the site at 1500 after work had been completed for the day and talked with local police and soldiers guarding the site. They also met with Judge Jakupovic from 1700-1930 that evening to discuss the delivery of supplies by Amor Masovic the following day and the progress of the exhumation. Judge Jakupovic welcomed the participation of PHR and Tal Simmons in the exhumation process. He also indicated the need for additional forensic pathologists to assist in the autopsy and identification process.

On 3 September, Tal and Lipa worked inside the cave with two other members of the expert team. Work proceeded in a relatively slow and haphazard fashion due to the presence of the media and others interested in video-recording the site (including ICTY). Bodies were numbered, but not photographed prior to their removal.

After a brief discussion between Tal and Judge Jakupovic regarding who would go down into the cave and what procedures would be followed, it was agreed that crime technicians would number bodies prior to their removal and photographed them *in situ*. On 4 September, Tal worked in the cave again with Lipa and two other members of the expert team. Tal convinced Dr. Mesic of the need for her presence within the cave to aid in the identification of skeletal elements forming whole individuals. Amor Masovic arrived on the scene with a portion of the supplies for the exhumation delivered to him by PHR on 1 September in Sarajevo.

On 5 September, the group in the cave consisted of Tal, Zlaja Sabanovic (PHR, Tuzla), Lipa, two members of the expert team, Masovic, and Muhamed Mojkić (a member of Masovic's party videotaping the proceedings). The "expert team" consists of members of the Bihac Police who attended PHR's course on exhumations conducted by Eva Klonowski and who have participated in previous exhumations in the Canton. Dr. Mesic joined the group for part of the day. Dr. Mesic apparently passed her qualifying examinations for pathology during the war and is not thought of highly by other forensic pathologists in BiH (Cihlarz and Kesetovic in Tuzla, Dobraca in Sarajevo). She is not a specialist in forensic pathology, but rather does biopsy and frozen section work in the local Bihac hospital.

Tal tried to direct everyone to the need to remove bodies from the uppermost levels of the deposits prior to trying to remove them from the sides and bottom. Masovic and Mesic continued to work from the side of the talus slope. They encountered difficulties with their strategy of removing bodies, as many bodies that were partially exposed had body parts (often encased in clothing) that lay underneath other bodies higher in the deposits. At one point, Masovic removed a paired radius and ulna from the side area that had a ligature of string around them and waved them in the air while trying to draw Tal's attention. Tal informed him that she



had noticed it two days ago and had informed Dr. Mesic and the police of its presence and importance as evidence. She also informed him, however, that due to his actions in removing it from context, it was now completely useless as evidence as it could no longer be associated with a particular body.

Recovery of remains proceeded slowly over the next three days, from 6-8 September. On 8 September, work was halted in the early afternoon subsequent to the discovery of unexploded ordinance under one of the skeletons at the base of the talus slope, furthest from the cave opening. The decision of the local authorities was to halt work until de-miners and engineers from the BiH Army's 5th Corps could check out the ordinance, and the cave floor for safety. On 9 September, Agneta Johansson (OHR, Humanitarian Affairs) arrived for a site visit and ordered PHR employees to cease working in the cave; she upheld this decision after the 5th Corps engineers had declared the cave safe for workers to return to the exhumation. From 9-10 September, Tal continued to monitor the site, which consisted of counting body bags and briefly examining their contents as they were brought to the surface. At 1300 hours on 10 September, a message from Doug Ford (Deputy Director, PHR Tuzla) arrived relaying the information that the Expert Group meeting at OHR in Sarajevo had determined that the site was unsafe and that PHR employees should return to Tuzla. Arrangements for the deployment of Tal and a PHR team of two forensic pathologists and one forensic anthropology student to assist in the Forensic Monitoring Project beginning 15 September were confirmed.

#### General Problems with Recovery of Human Remains:

Due to spatial constraints and the poor quality of the electric lighting (one fixed and one hand held reflector, supplemented by battery powered head lamps) in the cave, only a maximum of six members of the expert team at a time could work effectively in the cave; similarly, the low temperatures and wet conditions allowed for a maximum of 3-5 hours work per day by any one group of individuals. Returning to the cave after a day's absence, with or without the work of another team having taken place between visits, was very disorienting. The poor light and pervasive mud made it very difficult to relocate and define characteristics of the work area, including individual bodies, clothing, and the relationship amongst them. Work thus proceeded slowly at the beginning of each group's time in the cave.

Commingling of bodies with one another and commingling of animal with human remains was also problematic. By the third day of the exhumation, a large pile of human bones had been made on one side of the talus slope; apparently, the first workers in the cave had thought that these were animal bones, not human bones. The cave did contain a large quantity of animal bones, namely those of cow and sheep/goat, and several decomposing animal skins. All parts of these animals were represented, but terminal phalanges, caudal vertebrae, and horn cores (waste elements in food production) were most common. None of the Bihac Expert Team was able to consistently and reliably distinguish between animal and human remains.

Human bones that were isolated elements or otherwise impossible to associate with a particular body were collected in a separate body bag. Later, in the morgue, it proved possible to match a few of these elements with a body through a comparison of size and morphology. This



was only attempted when the opposite side of same element was present; i.e. the right humerus was present but the left was absent. In this case the right humerus could be used as a template with which to search the pile of un-associated left humeri for a match. It was largely impossible, however, to re-associate the majority of isolated elements with a particular body.

Recognition of human bones and their articulation proved one of the biggest problems to the identification of whole bodies at Jama-Bezdan. Skeletal remains without associated clothing were frequently "stacked" on top of one another in such a way that elements of one individual had sunk into the remains of another; when these constituted individuals of approximately the same size and age (for example, bodies H-J 58 and H-J 59), separation of individuals was extremely difficult. In addition, the process of decomposition on a slope had caused much separation of bodies. Most of the members of the expert team did not possess adequate knowledge to recognize either the anatomy or articulation of a skeleton. They were thus unable to trace out and identify whole bodies that were neither isolated from others nor laying completely prone or supine, even when these bodies were clothed. Initially, even Dr. Mesic experienced great difficulty in distinguishing the head of a humerus from that of a femur, leading to her association of two sets of legs in two pairs of pants as a single body. Other such errors were common. None of the team (except Tal), including Dr. Mesic, was able to determine whether skeletal elements were from the right or left side of the body. This resulted in the collection of bodies that contained two right arms and no left arms, etc.. As none of the expert team (except Tal) could either recognize individual elements or determine their side, bones were not "counted" or re-examined before being placed in the body bags. Thus, the excavators themselves inadvertently caused a great deal of the commingling encountered later in the morgue. Obviously, this duplication of elements in some bodies also accounted for the incomplete nature of many other bodies.

No map was constructed to indicate the position of the bodies in the cave. Mapping should be standard procedure at any crime scene investigation. A member of the Expert Team at Jama-Bezdan should have kept and updated a map on which the position of every body was plotted prior to the removal of each body. The lack of mapping certainly contributed to the commingling problems at Hrgar.

Because much of the clothing had decomposed, its association with any particular body was equivocal. Strips of cloth often unrecognizable as an item of clothing, or part thereof, lay on, around or under skeletonized remains. The garbage deposits were partially comprised of clothing un-associated with any remains, further complicating matters. All un-associated clothing, cloth, shoes, etc. were nonetheless collected in a separate bag and, after being washed, were later reviewed by family members of the missing.

The removal of garbage coupled with the trampling effect of a large number of media personnel had rendered the appearance of the cave floor unrecognizable when compared to the photographs taken in early August by Lipa. Lack of control over the media and their presence within what was a "crime scene" was extremely detrimental to the work process and resulted in both the loss of evidence and, hence, the improper maintenance of chain of custody.

While the removal of bodies from Jama-Bezdan continued until 12-13 September, after 8 September (due to the first discovery of un-exploded ordinance) it became impossible for Tal (PHR) to directly provide assistance in the identification of fully articulated bodies and their



recovery. Dr. Mesic continued to work with the expert team in the cave, but as previously mentioned, her ability to differentiate animal from human bone, recognize skeletal elements and their articulation was dubious. At least 14 of the 24 body bags brought to the surface (numbers 60-83) after that date contain partial remains (in some cases half bodies, in others cases only a few bones) or remains with duplicate elements. The presence of animal bones in these last 24 body-bags was pervasive.

#### Autopsies and Forensic Examinations at Hrgar:

The autopsies were conducted in a morgue tent at Hrgar by Dr. Mesic with the assistance of the PHR team of forensic pathologists and anthropologists. The autopsy and dental recording forms developed by PHR for its PostMortem DataBase were used in the morgue at Hrgar. Dr. Mesic recorded all the peri-mortem injuries after consultation with the PHR team. It was Dr. Mesic's responsibility to determine cause and manner of death. Following completion of the autopsy, the forms were given to Dr. Mesic who then dictated her report to the court typist in the morgue tent. Dr. Mesic was also solely responsible for the final autopsy report, making the identification, filling in a death certificate, and notifying the family.

Dr. Mesic's experience with human skeletal remains and her knowledge of the human skeleton was relatively minimal prior to the work at Hrgar. The PHR team endeavored to teach her basic human osteology (recognition and siding of all major skeletal elements), basic forensic anthropology techniques (estimation of sex, age, and stature), and the recognition of a variety of skeletal trauma categories (entrance and exit projectile wound characteristics, the difference between post-mortem and peri-mortem fractures, the appearance of healed fractures and infections, etc.). The team began by working on several cases together with Dr. Mesic as a group, and then split into two teams (Page Hudson/Tal Simmons and Onder Ozkalipci/Ann Ross) with Dr. Mesic observing and assisting each team alternately.

Dr. Mesic was very receptive to learning these techniques and to the assistance of PHR's team in the morgue. By the conclusion of all the autopsies, she had been reasonably successful in acquiring the basic osteology and forensic anthropology skills, but demonstrated considerably less understanding of skeletal trauma. In particular, she experienced difficulty in distinguishing between post-mortem trampling fractures of the ribs and vertebrae and peri-mortem injuries. She seemed very unsure of her own abilities to assess cause and manner of death; she usually deferred to the PHR team's assessment.

#### Procedure:

Body-bags were brought to the morgue and placed on the autopsy tables. Photography of the remains as the body bags were first opened on the autopsy tables was done by crime technicians of the expert team. Again, had the body bags remained un-opened until this time (see "Procedural Problems" below), perhaps this procedure would have served to verify that the remains had not been tampered with and chain of custody had been maintained. As it was, however, the purpose of this photographic exercise remained a mystery.



After being photographed, the clothing was carefully removed from the remains. At this time, any damages to the clothing indicative of peri-mortem trauma were noted. For example, in one instance a bullet fragment was found lodged between a scrap of shirt fabric and the sternum; in another, a large nail pierced a pair of pants in the region of the right lower leg. Then, aluminum tags marked with the body number were attached to each item of clothing; when the clothing was within the body-bag but did not contain bones, it was marked with the body number, and the words *sa tijelo* (with the body) were also inscribed on the tag to indicate the lesser certainty of association. On the personal effects forms, in the category *Nadjena* (Found), the degree of association is noted. The clothing was taken by workers to be washed. Soil, adipocere, tissue, etc. from the clothing and skeletal elements were examined for evidence, removed and set aside.

The bones were then washed and placed on the autopsy table in anatomical position. An inventory of skeletal elements was recorded pictorially on a skeletal diagram with missing elements or parts of elements shaded (in some instances, the examining pathologist or anthropologist placed an "x" through missing elements). The sex, age, and stature of the skeleton were estimated and recorded on the PHR post-mortem data forms. Ante-mortem fractures, infections, deformities, etc. were recorded on the PHR data forms. A space for recording evidence (projectiles, ligatures, blindfolds, etc.) is provided on the PHR data forms, yet although several ligatures and the bullet fragment mentioned above were found by the examining PHR pathologist or anthropologist, Dr. Mesic nor the PHR team working with her apparently recorded any of these on the forms. The peri-mortem injuries, cause of death, and manner of death were also recorded on PHR data forms.

Dr. Mesic worked with one of the PHR teams on the autopsy and was called to consult with the other PHR team on their autopsies. She was responsible for personally recording the peri-mortem injuries, evidence, cause of death and manner of death categories on the PHR data forms. In her absence (several days due to illness or other duties), and in accordance with Judge Jakupovic's instructions, the PHR translator or Judge Jakupovic recorded the findings dictated to them on the forms.

Crime technicians were also responsible for photographic documentation of peri-mortem injuries, although their enthusiasm for this vacillated. At times they were unavailable and no work could proceed until they were located. At other times, they hovered over the table demanding to photograph the injuries while the examination of the remains was in progress and no conclusions had been reached. The automatic cameras used by the crime technicians were apparently personal possessions. These cameras were not suitable to taking detailed photographic documentation. The crime technicians also lacked good crime photography technique: an overview of many skeletal injuries was photographed, but individual injuries were rarely photographed; the arrows and centimeter scales employed in the photographs were over-large, unwieldy, and unsuitable to the material; the crime technicians insisted on photographing injuries in every case - even when there were no documented peri-mortem injuries or unique ante-mortem skeletal conditions; when directed to unique ante-mortem skeletal conditions by the pathologist/anthropologist, they were frequently reluctant to document them; etc.

When the autopsy and photography were completed, the skeletal elements were placed inside a clean, numbered body-bag. The soil, any tissue, adipocere, etc. that had been set aside



were also placed inside the body-bag according to local custom. Due to the large volume of moist soil and tissue, this procedure caused a complication later in the morgue procedure. It was extremely difficult and time consuming to locate individual bones if a body had to be re-examined to match missing elements, to locate the axis and atlas to calculate the Minimum Number of Individuals, to re-examine elements relating to the estimation of age, etc. It was suggested to the expert team that the skeletal elements be kept separate from the soil and tissue within the final body-bag, but this request was not heeded. The body-bag was removed to another tent for storage.

Dr. Mesic dictated the findings to a court typist present in the morgue, who typed the autopsy report. The PHR team also taught several members of the expert team to use the "Standard Personal Effects" form developed for PHR's PostMortem DataBase. This form, with the accompanying code tables and color chart, is used to record all details of all clothing and personal effects, and the relationship of these items to the body. After the clothing was washed, members of the Bihac expert team recorded the clothing on these forms. Concurrent with the recording of the details of clothing on the forms, a court typist entered a description of the items in the official autopsy report. This usually occurred after Dr. Mesic had dictated the autopsy findings to the court typist, and the clothing description was appended to the final report.

#### Identifications at Hrgar:

From a scientific perspective, the process of identification of the bodies from Jama-Bezdan at Hrgar was one of the most problematic procedural issues. Identifications began when family members viewed the skeletal remains and clothing and professed to recognize either clothing items or features of a skull and mandible (see "Procedural Problems" below). These examinations by family members took place in a poorly illuminated tent and the clothing was seen in an unwashed state. Family members often recognized an item of clothing and "claimed" the body as that of their missing person without being encouraged to continue to examine the rest of the remains in the tent. It is thus unknown whether or not family members might have recognized clothing items associated with other bodies had they looked further. An additional, related problem centered around the fact that, once bodies were "identified," they were removed to another tent and held there. It is again unknown whether or not all subsequent families visiting the site had access to the "identified" bodies; thus, it is likely that each group arriving to see the remains encountered a progressively smaller number of bodies from which to "choose."

Both "identified" and unidentified bodies were autopsied by Dr. Mesic and the PHR team. In order to make an un-biased appraisal, the PHR team insisted that they remain uninformed about any of the ante-mortem information for the "identified" bodies until they had concluded the autopsy and finalized their findings. It was clear, however, that Dr. Mesic often knew the details (name, birth date, etc.) of the purported identification prior to making her examinations. The other members of the Expert Team (police, judge, etc.) were also aware of these details and printed them on the body-bags until advised not to do so.

Family members were occasionally present in the morgue tent while the autopsies of their "identified" missing person was being conducted. Tal strongly discouraged this practice and



repeatedly asked the expert team and Judge Jakupovic to request that the families remain outside.

Although both Judge Jakupovic and members of the expert team claimed to have collected ante-mortem data from family members prior to the autopsies, several questions remain unresolved: 1) when the data was collected - prior to the exhumation? in the tent when families "identified" the remains?; 2) who collected the data - police officers or other individuals? 3) in what manner the data was collected - did the police visit families? Were families asked to come into the police station for interviews? etc. 3) where the data was stored; 4) why the data was not present at the site for comparison to the postmortem findings; and, 5) why the data never appeared at the site when identifications were being confirmed. A final effort was made by Tal on 3 October 1997 to locate the data both at the site and later in the central police station; she was informed that Rafik (a member of the expert team) had the data out at Hrgar.

Esad Bajramovic collected minimal ante-mortem information (sex, age, stature, etc.) from family members who visited the site on 30 September, but with two exceptions, the information related to individuals that were thought to be among the bodies, but the families had *not* recognized any clothing.

Upon conclusion of the autopsies on 29 September 1997, Tal made arrangements to review the identifications with Dr. Mesic on a case by case basis. Efforts to do this systematically were thwarted by Dr. Mesic's erratic schedule; the review was scheduled to begin on 1 October at Hrgar, but Dr. Mesic, after a brief appearance, apparently went back to the hospital after 0900 and did not reappear. On 2 October, Dr. Mesic began to review identifications with the family members, but following several cases where Tal did not believe that the autopsy evidence was consistent with the identification, she began to work exclusively with the families.

Laurie Vollen requested that PHR (Tal) review the identification process and follow as many cases as possible from first recognition of clothing items by the family to Dr. Mesic's formally making the identification. Several such cases are presented here:

Body 12      Identified as Fikret Begic; born 1969; father's name Mustafa.

This body was identified by family members, but no clothing was associated with these remains. No unique ante-mortem skeletal or dental features were noted at autopsy. The basis for this identification is therefore unknown.

Body 18      Identified as Fikret Seferovic; born 1962; father's name Mahmut.

This body was identified by family members who recognized the associated clothing. The clothing in this case, however, was relatively decomposed and not particularly distinctive. It consisted of the waistband, seat, and upper trouser legs of a



pair of army pants and the remnants of a brown, fake leather jacket with fleece lining. Army pants and fake leather jackets of this type were relatively common clothing items with the skeletons at Hrgar. There was antemortem data provided to Dr. Mesic which stated that the individual had been 30 years of age at the time of his disappearance in 1992, and his height was approximately 178 cm. When Dr. Mesic consulted the PHR team regarding this identification, they expressed concern about the recognizability of the clothing because of their generic quality. Dr. Mesic also informed that the height of H-J 18 was considerably shorter than the height they recollected for the missing person. The family returned the next day with a revised stature estimate of 170 cm. Furthermore, they insisted that they recognized a repair to the waistband of the pants, which included the addition of a blue drawstring. The autopsy findings for Body 18 indicate a male individual aged 26-45 years and with a height of 165.5-171.5 cm. No means of more positive identification through dental or medical records was possible, although the identification is not contradicted by the autopsy findings.

Body 48      Identified as Mujo Demirovic; born 1968; father's name Alage.

This body was identified by family members on the basis of numerous items of well-preserved, recognized clothing. Ante-mortem information was provided by the family who were present in the morgue during the autopsy. This information included stature (180 cm), age (24 years in 1992), and knowledge of missing dentition (two lower right back teeth, one lower left tooth, and several teeth missing from the right upper jaw). The findings at autopsy were consistent with the family's description. Body 48 was that of a male between the ages of 20-27 years and a height of between 177-183 cm. The dentition of Body 48 showed ante-mortem extractions of the right mandibular 1st and 2nd premolars, the left mandibular 1st premolar; the maxillary dentition could not be assessed due to fragmentation of the cranium from a gunshot wound. The identification is not contradicted by the autopsy findings, although no means of more positive identification through dental or medical records was possible.

Body 73      Identified as Ismet Vojic; born 1955; father's name Izet.

This body was identified by family members on the basis of recognized clothing, however most of the clothing was not associated with the skeletal elements in a reliable manner. The only clothing that could be directly associated with the remains (i.e. bones were contained within the clothing in approximate anatomical articulation) consisted of a pair of men's grey nylon socks and a partial lower pant-leg of indeterminate material and color. Other bones were contained within the body-bag, but these were arm bones and a few vertebrae and ribs which could not be reliably associated with the feet and lower leg bones within the clothing.

Thus, in the view of the PHR team, there was no possible way to confirm the



“identification.” The only data obtained from the autopsy was an estimate of sex (male) based on the large size of the tibia, an estimate of age (>20 years) based on the complete fusion of the proximal epiphysis of the tibia which indicated an “adult,” and an estimate of stature (172-180 cm) based on the tibia. None of this data is considered to be of a nature specific enough to confirm or reject an identification.

In addition, the recognized clothing (socks and pant-leg) was considered to be extremely generic; the PHR team had seen several socks and pants of very similar type in the course of the forensic examinations of the other bodies. No repairs to either the socks or pants were noted during the examination.

The PHR team stated that there was no scientific basis to identify Body 73, and that the family be informed of this determination. When all the autopsies had been completed, however, and the bodies were placed into caskets on which were written the body number and the name of the identified individual, Body 73 was still associated with the name of Ismet Vojic on the burial casket.

A total of 45 bodies were “identified” (i.e. names were associated with them).

#### Procedural Problems at Hrgar:

The vast majority of the problems encountered at the Hrgar site resulted from poor police procedure. In short, the members of the expert team failed to maintain chain of custody on the body-bags and their contents.

Once bodies were brought to the ground surface, the body-bags containing them were opened and photographed a second time. Why this was done, except possibly to compensate for poor light conditions in the cave, was never clear and seemed an un-necessary step. The bags were again closed and then transported a few meters into the tent where all bodies were stored throughout the exhumation process. If the bags had remained closed until opened for the autopsies, chain of custody requirements would have been maintained.

Unfortunately, individuals who had been admitted to the site at its road entrance were relatively free to walk in and out of this tent, open body-bags, touch and manipulate items contained within them, and otherwise “tamper” with the evidence. This tampering occurred both when these individuals were left alone in the tent and in the presence of expert team members. During the exhumation process itself, tampering occurred in two ways: primarily it occurred with media personnel who wanted to photograph ligatures, bones, etc., and secondarily it occurred through family members searching through the lines of body-bags for recognizable clothing and personnel effects, or in some cases for a “recognizable” skull.

When this problem was discussed with Judge Jakupovic and members of the expert team, the response was to state, re. the media, that people needed to see and to know what had happened, and, re. the family members, that they had a need to search for their loved ones by examining the clothing to see if they recognized it. When Tal pointed out that the clothing was encrusted with mud and not particularly recognizable, she was assured that family members



could still be certain.

Beginning on or around 15 September, large numbers of family members began to arrive (including one full bus on 16 September) to examine the remains in the tent. While family members were supposed to be escorted by a member of the expert team when viewing the remains, in reality they were free to wander amongst the now open body-bags and sort through the remains, clothing, evidence such as ligatures, and any associated personal effects. At times, there were upwards of 30 family members in the tent, most of them un-escorted. Tal spoke with members of the expert team and Judge Jakupovic regarding this practice and advised them that the practice should cease until after all the autopsies had been completed. Judge Jakupovic and the team declined to deny the families access to the bodies. Tal then suggested that only one family at a time should be admitted to the tent in the company of a police official and the family members should not be allowed to physically touch anything. The Judge agreed to this, yet the policy was not enforced. In addition to Tal, both Doug Ford (on 16 September), Laurie Vollen (on 22 September) and officers of the IPTF Bihac Station (M.E. Floyd, RCMP and J. Cruz, NYPD) saw family members manipulating bones, clothing, personal effects and documents on the bodies.

In several cases, items that were removed from body-bags for closer examination were taken away from bodies to the tent windows for viewing with better light; these items did not always get returned to the proper bag. In one instance in the morgue, an "identified" body was examined by the PHR team. The body consisted of two un-matched socks (one of which contained foot bones), a grey-blue pant-leg (containing the tibia and fibula), and some un-associated clothing and unarticulated bones. When asked what the family had recognized about the clothing, the police indicated that it was the empty sock. It was the recollection of the police that the sock had once contained bones and that the family member had removed them to look more closely at the sock. Of course, there was no way to associate the sock with the rest of that body, nor to associate the sock with the foot bones of any other body.

Recommendation:

*Family members should not be allowed access to the remains, clothing, personal effects, or documents until after they have been appropriately recorded and logged by the forensic examiners (crime technicians and pathologists/anthropologists).*

Recommendation:

*It is equally imperative that **clothing should not be "identified" until after it has been washed and dried.** Both the process of decomposition and the dirt/mud associated with interment obscures color and other details of clothing. This renders clothing generic and indistinct - as a result, families may likely mis-identify clothing items, and hence, by extension, the individual with which they are associated.*



As a result of these practices, when bodies reached the morgue for autopsy and examination, a recovery and identification situation already made difficult by the conditions in the cave had become even more complicated due to the subsequent manipulation of the remains and other evidence. It was impossible for the pathologists/anthropologists conducting the examinations to determine whether relationships existed among the skeletal remains themselves, the remains and the clothing/personnel effects, etc.

Recommendation:

*Photographs of the body in situ should accompany the body to the morgue. The examining pathologist/anthropologist should then consult the photograph to assess the certainty of relationships (and degree of association) among the items accompanying the body.*

Because no map was constructed plotting the relative locations of the recovered bodies, commingling became a chronic and unresolvable problem during the examinations of the remains in the morgue. Because several teams of individuals were working simultaneously in different locations on the cave floor and bodies were numbered sequentially as they were removed, no one could recall the relative positions of the remains. If a map had been constructed, commingling encountered in the morgue might have been resolved by consulting it.

Recommendation:

*The positions of all bodies and other evidence should be plotted on a map of the site prior to being photographed and removed. The map should be available to the examining pathologists and anthropologist in the morgue.*

Final Meeting and Discussion with the Bihac Expert Team (2 October 1997):

On the afternoon of 2 October 1997, Tal Simmons met with members of the Bihac Expert Team (including Dr. Mesic, the crime technicians, the criminal investigators, Judge Jakupovic, and Esad Bajramovic) to discuss the problems encountered by the team during the exhumation and identification process at Hrgar. Members of the team were asked to identify the problems they felt were prevalent during these processes. Tal Simmons addressed these issues with the team and also brought several other issues to their attention. The meeting was well attended and lasted over two hours. The opinions of the team were relatively consistent and unanimously expressed.

The major issues identified and discussed by members of the team included: personal safety, fear, and lack of psychological preparation for the exhumation work. In response, Tal suggested that several recommendations be reviewed by the Bihac Expert Team prior to future exhumations:



Recommendation:

*Safety should be assessed by an independent party in the future in order to ensure that the concerns of the Expert Team are considered and properly evaluated.*

*The Expert team should recruit a local psychosocial worker to become a member of the team. This individual should be available to meet with the team prior to the exhumation to discuss their concerns and he/she should be on call during the exhumation to provide support for their participation in an emotionally difficult process.*

*PHR should provide a workshop on osteology designed to teach the recognition of skeletal elements to members of the Expert Team.*

Additional issues identified by the team included: the need to computerize antemortem and postmortem data, large equipment needs, a planning session prior to beginning the exhumation, the process of identification, the need for a media spokesperson, and the need for a set time for families to visit the exhumation/identification site.

Tal brought up the procedural problems outlined in the preceeding section of this report. The team was initially insistent that they could not control such issues as family members accessing the body bags and their contents prior to their examination in the morgue. Furthermore, they insisted that these problems had never occurred on any previous exhumation as they had procedures to handle these situations and that the only problem at Hrgar was because of the nature of the cave itself. Tal persisted in pointing out that the only difference the nature of the cave made was in the recovery of the remains and that the vast majority of the problems occurred *after* the removal of the remains from the cave. She pointedly reminded them that the issue was one of maintenance of chain of custody and basically nothing else. When asked what their procedures were to ensure maintenance of chain of custody at previous exhumations and what happened that they were not implemented at Hrgar, the team had no answer. It was very clear from the discussion that then ensued that they understood the need for controlled procedures in the future. The lack of a map was also discussed by Tal and the team understood the necessity of mapping body positions in the future.

The team requested Tal's (PHR's) assistance in future exhumations and their participation in a symposium series planned for the following year. Tal advised the Expert Team how to request supplies in the future, both from which organization (via PHR and ICMP) and how far in advance (at least 4-6 weeks to ensure timely arrival).

Tal also made arrangements to obtain copies of the autopsy forms and the final report to be written by the Bihac Expert team on the Hrgar, Jama-Bezdan site.



## Summary:

PHR's involvement at Hrgar, Jama-Bezdan represented a unique opportunity to observe and advise the local Expert Team from the beginning to the end of the exhumations, autopsy, and identification process. By being on site throughout the entire process, a clearer picture of local Expert Team practices on exhumations and subsequently on autopsies and identifications was obtained. PHR's team contributed to the process at the Hrgar site in many ways, including providing supplies, equipment, and expertise in the form of both personnel, knowledge, and technical assistance. The Bihac Expert Team felt they benefited from PHR's involvement and have requested PHR's assistance in the future. The Expert Team gained skills, technical knowledge, and procedural information that, it is hoped, they will employ in their next exhumations.



## BIHAC PROCESS

The morgue tent and workers



1. The platform over the cave + the license plates from the garbage inside.



2. Coffins arriving.





3. L---R Ann Ross, Samira Mesic, Tall Simmons, Judge Jakupovic, Elvira Tahirovic, Onder Ozkalipci examine remains.



Dr. Samira Mesic dictating her autopsy report to a court typist.





5. Tall Simmons removing clothing.





**6. Tall Simmons talking with Judge Jakupovic about procedures. ( Elvira Tahirovic translating )**



Figure 1. Cross-section view of the Hrgar, Jama-Bezdan cave site (*not to scale*). Dashed lines indicate presumed extent of the cave area.

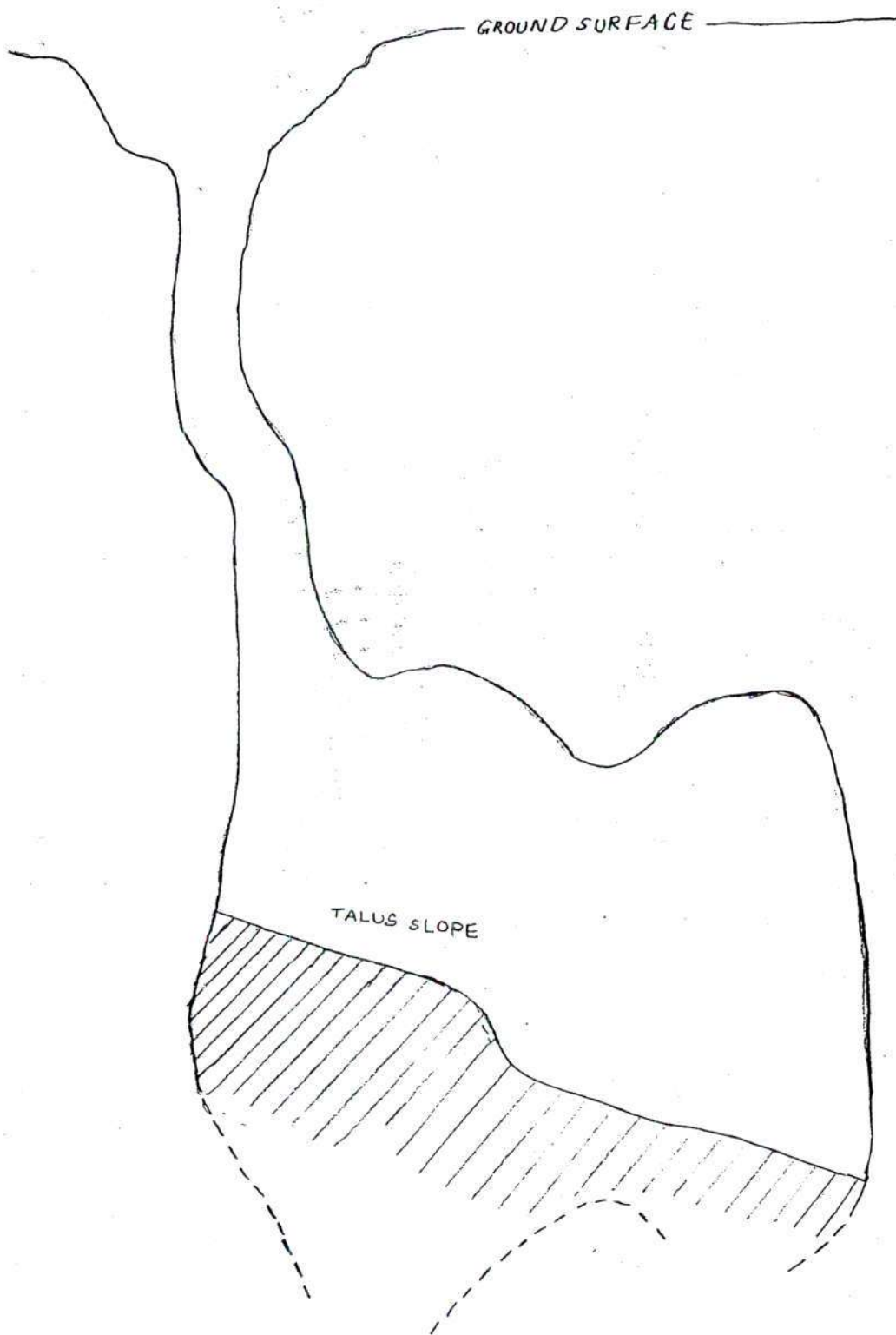
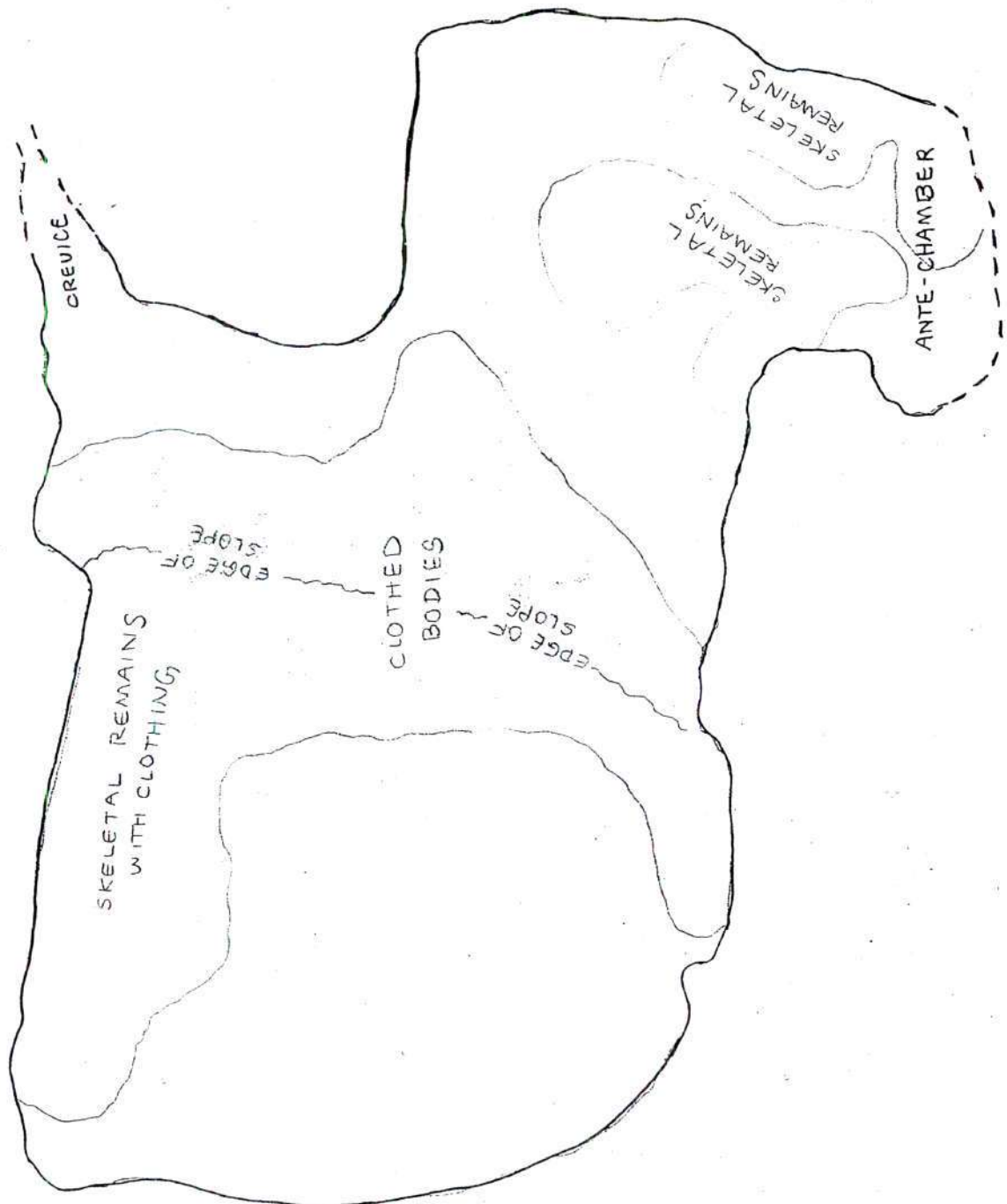
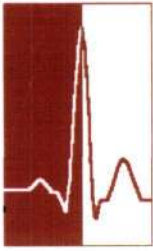




Figure 2. Area of the cave floor at the Hrgar, Jama-Bezdan site (not to scale). General locations of concentrations of bodies are noted. Dashed lines indicate presumed extent of the cave area.







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**Forensic Monitoring Project Report  
Hrgar, Jama-Bezdan Exhumations of the Bihac Expert Team  
(1 September - 5 October 1997)**

Tal Simmons, Ph.D., D-A.B.F.A.  
Director, Forensic Monitoring Project  
Physicians for Human Rights, Tuzla

Report Date: 3 November 1997

## II. FINDINGS

### Summary of Events:

The exhumation and identification process at the mass grave site of Hrgar, Jama-Bezdan began on Monday, 1 September and was completed on Saturday, 4 October 1997. The exhumation and autopsies were conducted by the Unsko-Sanski Canton's expert team, which consists of Crime Technicians and Inspectors from the Bihac police, Bihac pathologist Dr. Samira Mesic, and members of the local court. Dr. Tal Simmons, the Director of the Forensic Monitoring Project for Physicians for Human Rights (PHR) assisted in the removal of the skeletal remains from the cave from 2-11 September. Work in the cave was halted several times due to the discovery of unexploded ordinance under the skeletal remains and garbage, and once after a policeman slipped and fell. The autopsies were carried out from 16-30 September by Dr. Mesic with the technical advice and assistance of Dr. Simmons and a PHR team of pathologists and anthropologists from the United States and Turkey. The operation concluded on 5 October with a funeral service held in the center of Bihac for all the victims recovered from the cave.

The Minimum Number of Individuals recovered from Jama-Bezdan was 51. The most frequently recorded cause of death was multiple gunshot wounds, although deaths were also caused by both blunt and sharp force trauma. Several of the bodies were found with ligatures fashioned from a variety of materials tied around their wrists. Names were associated with 45 of the individuals exhumed from the cave.



### Site Description Overview:

Hrgar is a mountainous limestone region located just southeast of the village of Ripac. The mass grave of Jama-Bezdan is a natural vertical cave shaft that is still actively forming and increasing in depth. Trees and other vegetation surrounded the shaft and grew along its walls to some depth. At present the cave shaft is between 2-3m wide and extends some 80 m in depth to a muddy bottom (Figure 1). The cave "floor" is roughly rectangular, and approximately 4 x 7 m in area, with one narrow, tall crevice and one wide, low antechamber extending from the main area (Figure 2). The walls of the cave shaft are relatively dry in the upper half, but water runs freely down one side of the shaft from this point. One wall of the cave itself is continuously running with water and water drips heavily and steadily from other points in the "ceiling." Light adequate to visual exploration does not reach the cave floor. The ambient temperature inside the cave held steady at approximately 3-4 degrees Centigrade.

### The Mass Grave:

The cave had been used as a garbage dump for many years which created a talus cone of deposits on the cave floor. The area directly under the opening contained the deepest deposits and was the highest point on the cave "floor." The garbage consisted largely of tires and inner tubes, shattered glass bottles, plastic containers, expired license plates and identity cards, animal carcasses, leather army belts and web gear, a variety of rusted firearms and unexploded ordinance, etc.

The more recently deposited (relative to the majority of the garbage) human remains had, when thrown into the cave, rolled downhill to the lower sides and far reaches of the cave bottom, and in a few instances into the small antechamber. Bodies were frequently "stacked" and/or "tangled" in these lower areas along the cave sides and at the base of the talus cone. Almost no articulated remains were found near the top of the deposit. It appears that, as decomposition occurred, skulls and other body parts also rolled downhill and became separated from the rest of the body. In several more clearly articulated bodies, skeletal remains in clothing found on the slope of the talus cone appeared to be "stretched out" beyond their actual height.

Nearly all the remains were completely skeletalized due to the action of water in the cave for the presumed five years since their deposition. The fauna of the cave (nematodes of several species, rodents, etc.) contributed to the decomposition process as well. A relatively few bodies (approximately 3-5) contained significant amounts of adipocere and in some cases recognizable muscle tissue. Only one case retained a desiccated brain and another retained some organ structure (the diaphragm and intestinal mesentery were distinguishable).

### History Relating to the Mass Grave:

Local authorities believe that the human remains at Jama-Bezdan are those of Muslims who were held in the Ripac concentration camp in July of 1992. On 11 July 1992, a number of



concentrations camp inmates were believed to be released, but those that remained behind were never seen alive again. Numerous cartridge casings from 7.62 ammunition were recovered from the forested area immediately surrounding the opening to Jama-Bezdan. This is consistent with the victims being shot at the site prior to being thrown into the cave shaft. The cave walls show evidence of craters caused by grenades exploding within the cave.

Local authorities (Mr. Esad Bajramovic and Judge Adem Jakupovic) related that information regarding the use of Jama-Bezdan as a mass grave had come from "registered Serb prisoners" held during the war.

#### Exhumation:

The members of the Bihac Expert Team were responsible for the exhumation which took place from 1-1. Members of the team included inspectors and technicians from the Crime Police units and Dr. Mesic, a pathologist from the Bihac hospital. Judge Adem Jakupovic was responsible for daily operations. Amor Masovic also participated in the exhumations. PHR's Director of the Forensic Monitoring Project, Tal Simmons, provided technical advice and assistance during the exhumation process.

Due to spatial constraints and the poor quality of the electric lighting (one fixed and one hand held reflector, supplemented by battery powered head lamps) in the cave, only a maximum of five-six members of the Bihac Expert Team at a time could work effectively in the cave; similarly, the low temperatures and wet conditions allowed for a maximum of 3-5 hours work per day by any one group of individuals. Returning to the cave after a day's absence, with or without the work of another team having taken place between visits, was very disorienting. The poor light and pervasive mud made it very difficult to relocate and define characteristics of the work area, including individual bodies, clothing, and the relationship amongst them. Work thus proceeded slowly at the beginning of each group's time in the cave.

A large quantity of animal bones, namely those of cow and sheep/goat, and several decomposing animal skins were present in the cave. All parts of these animals were represented, but terminal phalanges, caudal vertebrae, and horn cores (waste elements in food production) were most common.

Human bones that were isolated elements or otherwise impossible to associate with a particular body were collected in a separate body bag. Later, in the morgue, it proved possible to match a few of these elements with a body through a comparison of size and morphology. This was only attempted when the opposite side of same element was present; i.e. the right humerus was present but the left was absent. In this case the right humerus could be used as a template with which to search the pile of un-associated left humeri for a match. It was largely impossible, however, to re-associate the majority of isolated elements with a particular body.

Skeletal remains without associated clothing were frequently "stacked" on top of one another in such a way that elements of one individual had sunk into the remains of another; when these constituted individuals of approximately the same size and age (for example, bodies H-J 58 and H-J 59), separation of individuals was extremely difficult. In addition, the process of decomposition on a slope had caused much separation of bodies.



Because much of the clothing had decomposed, its association with any particular body was equivocal. Strips of cloth often unrecognizable as an item of clothing, or part thereof, lay on, around or under skeletonized remains. The garbage deposits were partially comprised of clothing un-associated with any remains, further complicating matters. All un-associated clothing, cloth, shoes, etc. were nonetheless collected in a separate bag and, after being washed, were later reviewed by family members of the missing.

#### Summary of Autopsy Findings:

Eighty-three body bags of associated human remains were brought to the surface during the exhumation process from 1-13 September (Table 1), but many of these contained incomplete bodies. The remains, contained within a total of 83 body-bags, were examined by Dr. Mesic and the PHR team. The remains within all 83 bags were autopsied, and it was determined by PHR that the number of bodies represented by these remains was less than 83 individuals. All the remains that the exhumation team had been unable to associate with a particular body were also examined. A *minimum number* of 51 individuals was calculated by PHR based on the number of atlases (cervical vertebra 1) present in all the human skeletal material from the site. The remains probably represent greater than 51 individuals, but less than 83 individuals. A rough estimate, based on the completeness of remains as recorded in the autopsy reports, would be approximately 70 individuals.

All individuals examined were males between the ages of 16 and  $\geq 65$  years. In addition, remains and some clothing of a 3-5 year old child of indeterminate sex (H-J 51) were also recovered from the cave. A summary of the data on minimum and maximum age distribution is presented in Figure 3. Using the Trotter (1970) formulae, the average estimated stature for the population was calculated to be around  $173 \pm 3$  cm, with a range of 155 to 183 cm for the entire population.

The prevalence of ante-mortem skeletal trauma/deformity at Hrgar was 13.25%, or 11 of the 83 sets of remains examined. The most common antemortem condition in this mass grave population was healed fractures; 5 individuals exhibited one or more healed rib fractures and 2 individuals exhibited one or more vertebral compression fractures. In addition, the shoulder of H-J 64 showed a probable slipped humeral head epiphysis; the differential diagnosis is a dislocation with extensive bone remodeling. Bone infections were also relatively common. One individual (H-J 76) showed osteitis subsequent to a fracture of the distal fibula. Three individuals (H-J 20, 31, and 70) exhibited active osteomyelitis, an infection of the bone and bone marrow cavity usually resulting from an open wound or fracture; osteomyelitis may also be associated with projectile injury. One individual (H-J 2) exhibited a condition which would have caused noticeable deformity. The vertebral column of H-J 2 (a 17-20 year old male) showed a compression fracture of the 9th thoracic vertebra, but this individual also suffered from kyphosis (forward curvature of the spine) and scoliosis (side to side curvature of the spine). The right leg of H-J 2 exhibited muscle attachments at the linea aspera (vastus group muscle insertions) and at the soleal line (soleus muscle origin) that were considerably enlarged compared to those of the left leg.



Perimortem injuries at Hrgar, Jama-Bezdan consisted primarily of gunshot injuries. This finding is consistent with the presence of large quantities of 7.62 ammunition on the surface of the site surrounding the cave shaft opening. Forty-nine of the remains exhibited gunshot wounds, and of these 35 exhibited multiple gunshot wounds. There was no discernable consistent patterning to the gunshot injuries, although the head, pelvis, legs, arms and rib cage (in decreasing order of frequency) were common sites of injury. Five bodies exhibited a combination of perimortem trauma, including gunshot wounds and blunt force trauma, the latter always located on the cranium. Three cases exhibited only blunt force trauma to the cranium and one case (H-J 52) exhibited sharp force trauma to the cranium with an implement the size and shape of a screw driver.

Cause of death was recorded in 49 cases. In 30 cases, the cause of death was multiple gunshot wounds; in 12 cases, the cause of death was a gunshot wound; in 3 cases, the cause of death was blunt force trauma to the head; in 1 case, the cause of death was sharp force trauma; and, in 4 cases the cause of death was recorded as unknown. Ligatures of varied type were present in a number of cases; the exact number is unknown. All evidence was photographed by the crime technicians of the Expert Team, but these photographs were not made available to PHR. Individual autopsy reports for the 83 cases examined are appended to this report. Manner of death in all examinations was homicide.

#### Identifications:

The Bihac expert team associated names with 45 of the bodies recovered at the site (Table 2). The remainder are unidentified. All named individuals were males between the ages of 18 and 55 years at the time of their deaths in 1992.

#### Burial:

A funeral service for all remains recovered from Hrgar, Jama-Bezdan was held in the center of Bihac at noon on 5 October and the burial took place the same day. Both identified and unidentified remains were buried in wooden caskets. The identified bodies were buried with their associated clothing. The clothing associated with unidentified remains and all clothing unassociated with any remains was stored by the police for potential future identification by family members of the missing not present during the exhumation and identification process at Hrgar.





1. Ligatures



2. Ligatures



**3. Posterior view of sternum**  
Arrow indicates bullet lodged





**4. Anterior view of sternum with clothing**  
Arrow indicates bullet lodged



5. Compression fracture with kyphosis.  
Individual also suffered from scoliosis



6. Compression fracture of thoracic vertebra.





7. Well healed rib fracture example.



8. Osteomyelitis of the right femur.





9. Slipped humeral epiphysis during groth.  
Adult shown



10. Healed fracture of fibula with osteitis



Perimortem Trauma.



11. 2 bullet wounds to tibia (posterior)



12. Bullet wound to rib



13. Bullet wounds to right radius + ulna.



14. Bullet wounds to scapula + clavicle.





15. Bullet wound to upper humerus.



16. Bullet wound to left tibia ant/post.



17. Blunt force trauma to cranium (frontal)



18. View of internal occipital.  
Bullet entrance.

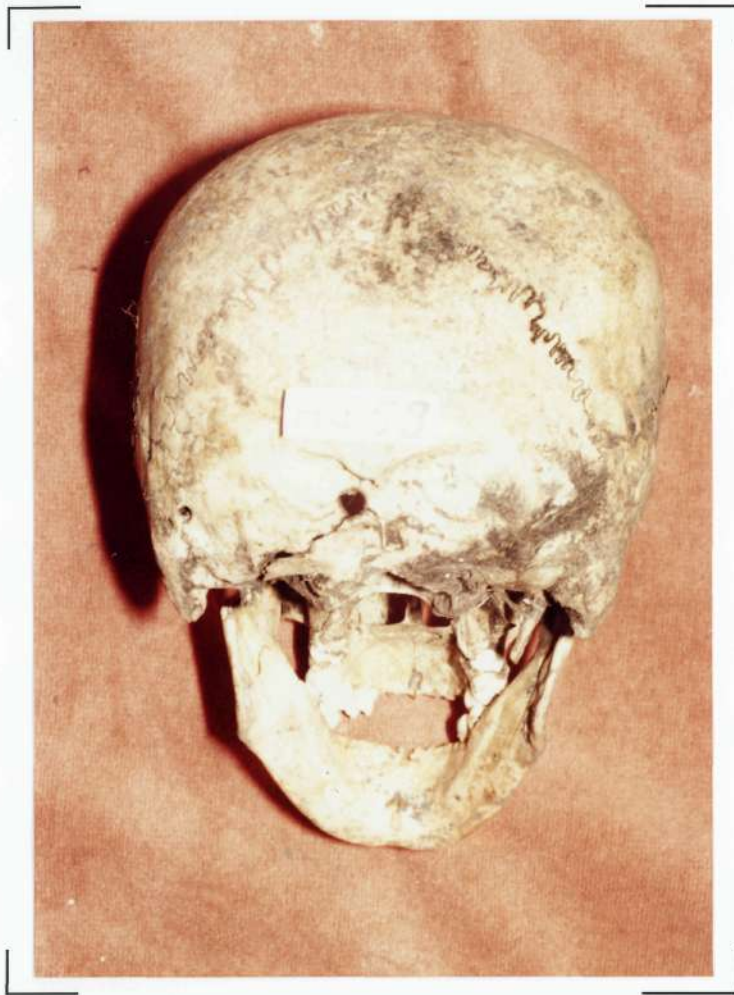




19. Bullet exit to left innominate.  
Entered laterally ----- med



20. Bullet wounds to pelvis sacrum and  
left femur



21. Bullet entrance to basi-occiput.



22. Bullet exit and left fronto sphenoidal suture.





23. Bullet entrance - central occipital.



24. Sock + boots belonging to 3-5 years old child.



**25. Blunt force trauma to right parietal +  
temporal**



Figure 1. Cross-section view of the Hrgar, Jama-Bezdan cave site (*not to scale*). Dashed lines indicate presumed extent of the cave area.

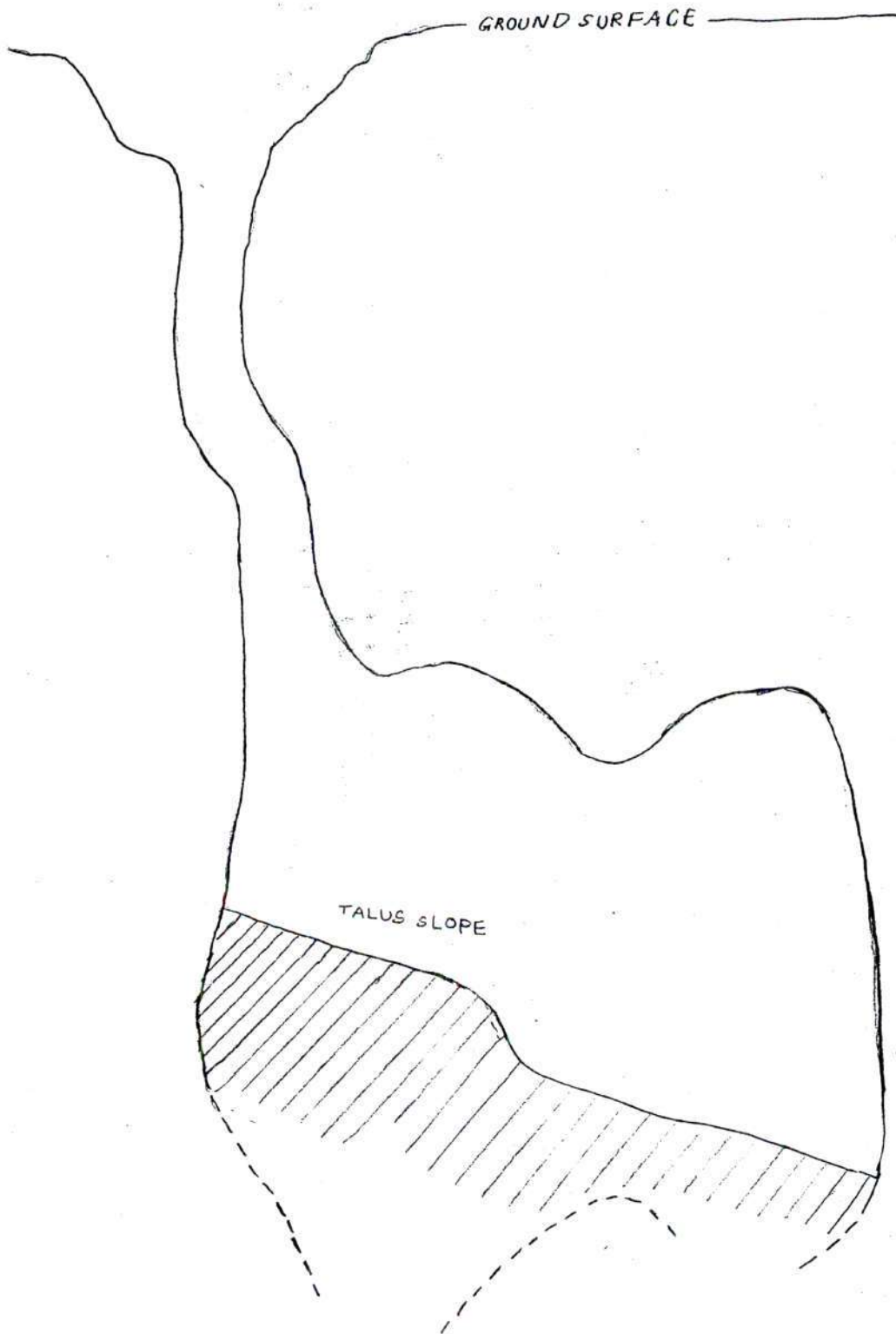


Figure 2. Area of the cave floor at the Hrgar, Jama-Bezdan site (not to scale). General locations of concentrations of bodies are noted. Dashed lines indicate presumed extent of the cave area.

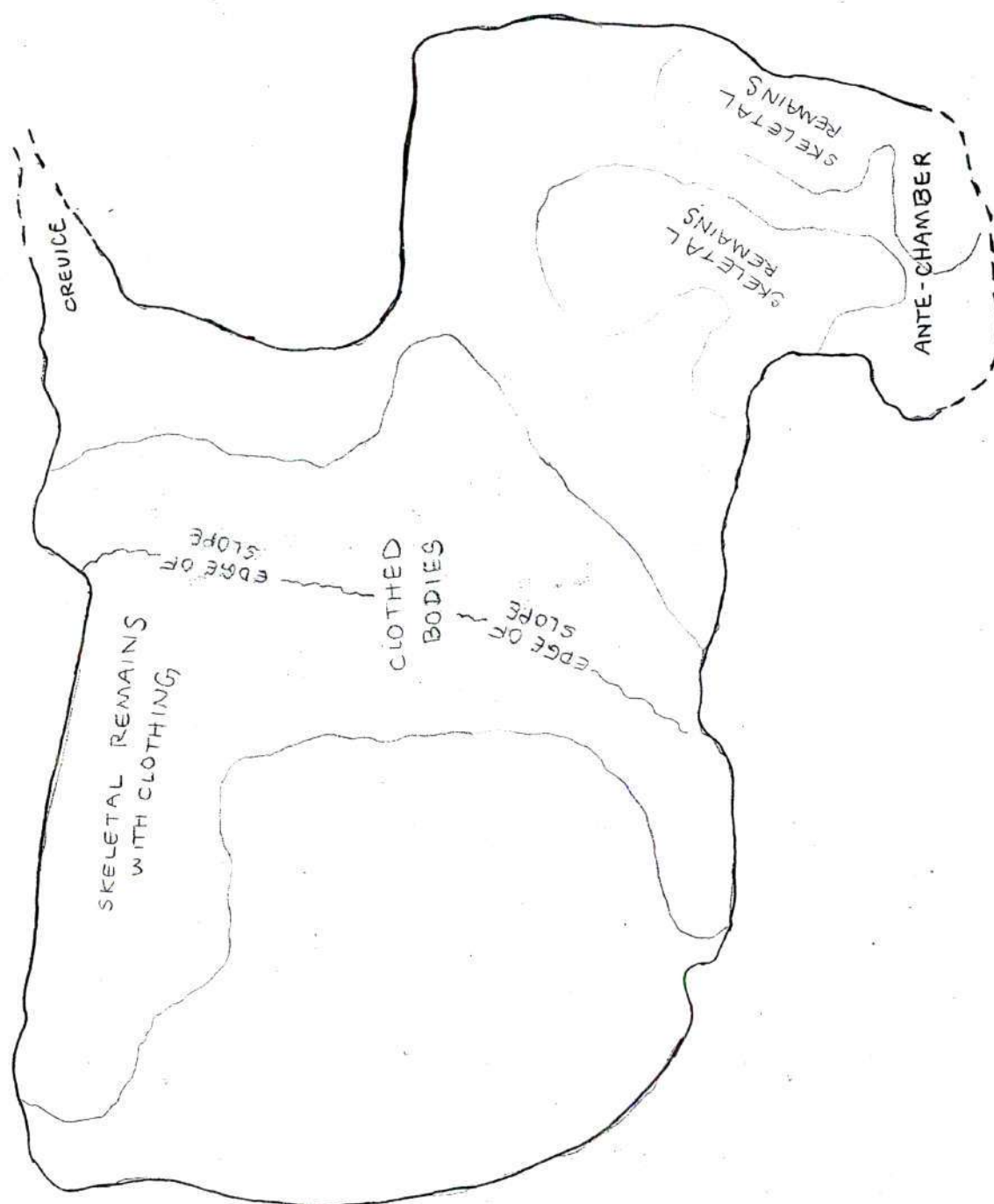




Figure 3. Age Distribution of the Hrgar, Jama-Bezdan Population

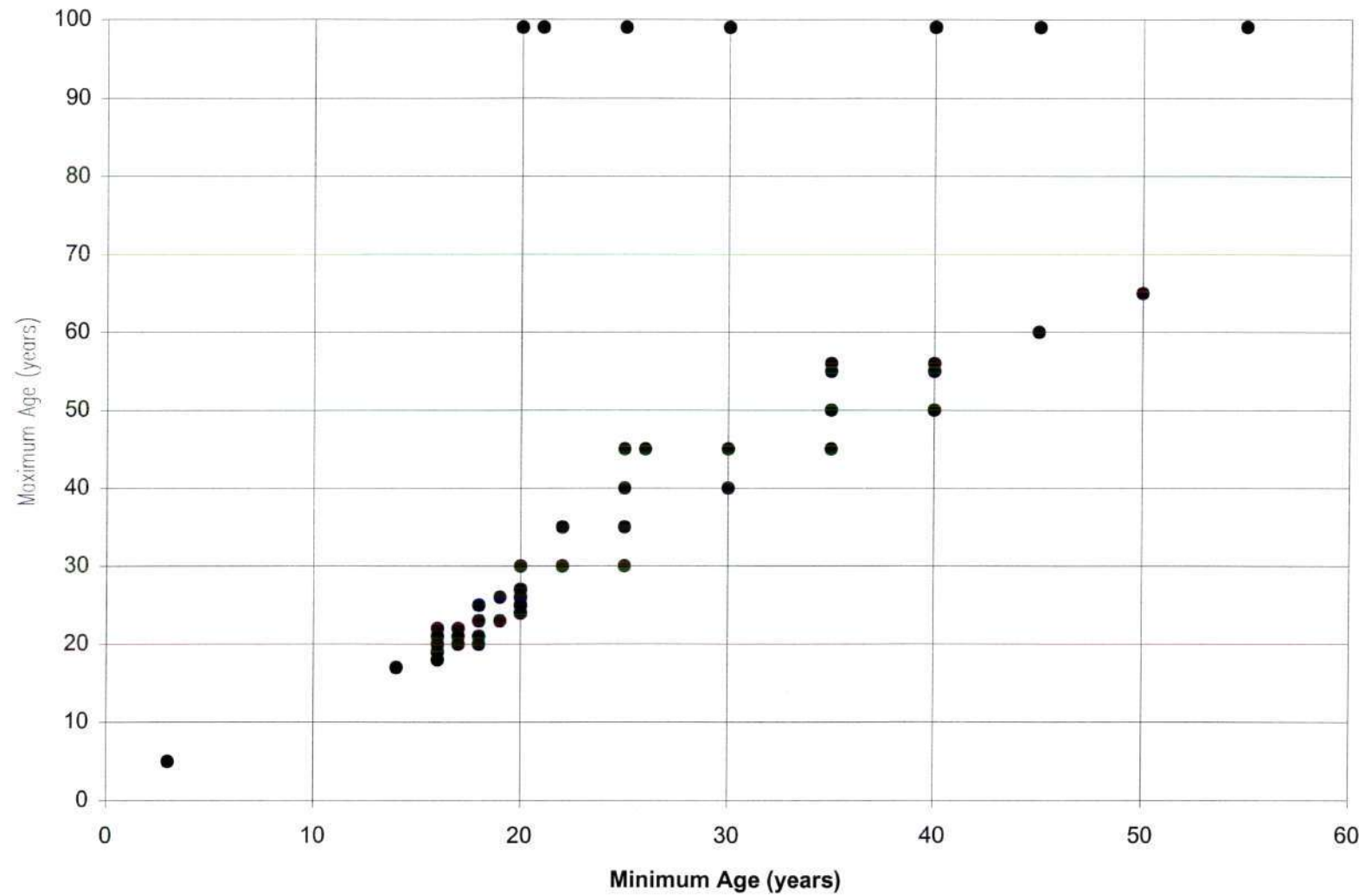


Table 1. Body-bags recovered per day at Hrgar Exhumation.

Date	Number of Body-bags Recovered at Hrgar, Jama-Bezdan
1.9.97	2
2.9.97	2
3.9.97	8
4.9.97	6
5.9.97	11
6.9.97	8
7.9.97	14
8.9.97	8
9.9.97	1
10.9.97	10
11.9.97	4
12.9.97	6
TOTAL	83



Table 2. Names Associated with Bodies  
Exhumed from Hrgar, Jama-Bezdan

Body No.	Name	Father's Name	Date of Birth
1	Mesic, Salih	Ibrahima	1947
3	Dervisevic, Muharem	Ibrahima	1942
5	Hasanagic, Zaim	Ahmet	1960
6	Dzafica, Ermin	Hasan	1974
7	Dzafica, Hasan	Ibre	1950
8	Alivuk, Emir	Mumin	1972
9	Crnkic, Fuad	fejzo	1972
10	Kasic, Avdo	Nazif	1962
12	Begic, Fikret	Mustafa	1969
13	Traljesic, Ismet	Muharem	1973
14	Delic, Hazin	Alija	1951
15	Vojic, Edhas	Edham	1958
16	Bilic, Muhamed	Husnija	1973
17	Pehlivanovic, Fadi	Avdo	1962
18	Seferovic, Fikret	Mahmut	1962
19	Pehlivanovic, Jusuf	Smail	1946
20	Ruznic, Ibrahim	Rame	1937
22	Alivuk, Asim	Mahmut	1962
25	Ramulic, Muhamed	Huse	1959
29	Kasic, Ale	Nazifa	1971
33	Dedic, Husein	Mustafe	1962
35	Eminovic, Husein	Jusufa	1968
36	Mesic, Halid	Bege	1972
37	Tutic, Smail	Smaje	1965
38	Alivuk, Ramiz	Ibrahima	1969
39	Dedic, Esad	Muhe	1961
43	Kurtgic, Sead	Smaje	1953
46	Anadolac, Enes	Mahmuta	1959
47	Tutic, Ale	Smaje	1951
48	Demirovic, Mujo	Alage	1968
49	Vojic, Asmir	Muhameda	1973
52	Siljdedic, Husein	Mahmuta	1943
54	Demirovic, Dedo	Muje	1951
55	Mesic, Itero	Bece	1958
56	Ramulic, Nihad	Huse	1967
62	Vojic, Mesud	Osme	1961
63	Kadic, Ahmet	Avde	1948
65	Seferovic, Fuad	Mujaga	1960
66	Seferovic, Smajo	Mahmut	1954
67	Kulenovic, Mahmut	Muse	1956
68	Kosovic, Rasim	Osman	1949
69	Susnjar, Zijad	Meho	1973
70	Dizdarevic, Edham	Dervis	1941
73	Vojic, Ismet	Izet	1955
80	Zajkic, Ahmir	Ibrahim	1971