

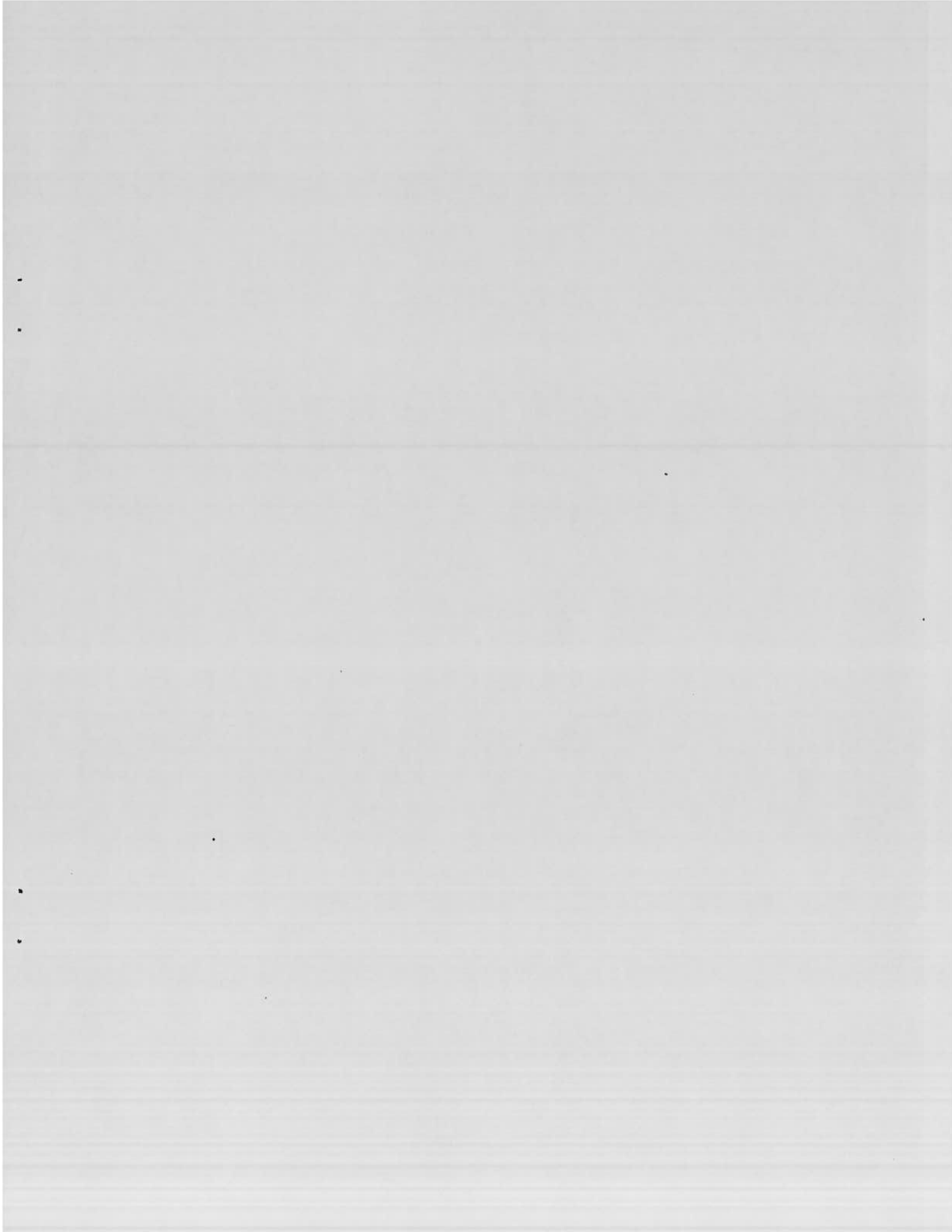
GRADE 11

TOPICS IN SCIENCE

FORENSICS UNIT



DO NOT WRITE IN BOOK



Check off when you have completed the assignment!

FORENSICS UNIT

1. Watch an episode of CSI
 - a. Write a summary of the show. Include the setting, plot, characteristics and conflict. It should be approximately 250 words. You should include details about how the crime scene was solved using forensics.
 - b. Pick out 5 words that you did not know and define them using the Forensic Science – Dictionary written by Suzanne Bell in the library. If you cannot find the words in there, use the Internet as an alternative source.

2. Read the articles provided and answer the following questions. Each response should be approximately be written in a paragraph approximately 50 words long.
 - a. Who was Jeffrey Dahmer?
 - b. What did he do?
 - c. How did they find him?
 - d. How was forensics used?
 - e. What is a Genocide?
 - f. What is a massacre?

3. Get the book DNA on Trial from the library.
 - a. Read Chapter 1
 - b. Write summary notes on the chapter. Use the concept frame provided to summarize the idea.
 - c. Create a 5-question quiz on the chapter.

4. Gel Electrophoresis –
 - a. Write a 1 page typed, double spaced summary on what gel electrophoresis is and how it helps in crime scenes. Make sure to include where you got your information.
 - b. Go to the following site and work through a virtual Gel Electrophoresis: <http://gslc.genetics.utah.edu/units/biotech/gel/>

5. Find a website that has an activity that you could do with relation to forensics.
 - a. Find the website.
 - b. Do the activity.
 - c. Give the name of the website to your teacher.
 - d. Rate the activity by answering the following questions:
 - i. What did you like about it?
 - ii. What did you not like about it?
 - iii. What was the point of the activity?

6. Create an assignment for you to do with relation to Forensics. It could be a paper, reading a book, creating a comic or movie, making a PowerPoint. You get to choose the assignment. It needs to include how it will be marked and the things that it required. You be the teacher!

Jeffrey Dahmer

During the summer of 1991, 39-year-old Jeffrey Dahmer was arrested at his home in Milwaukee, Wisconsin. His one-bedroom apartment was then searched for human remains.



No one would have suspected anything, had it not been for a handcuffed man found running from Dahmer's apartment building. He informed police officers that he had barely escaped death at the hands of a man who was living at the Oxford Apartment Complex. As a result, the police officers agreed to investigate the apartment.

Over the previous 13 years, Dahmer had carried out a series of murders upon men whom he had

picked up, and in some cases offered money in return for photography sessions. Once in his apartment, he would drug and strangle them. Then he performed sexual acts upon the corpses, after which they were mutilated.

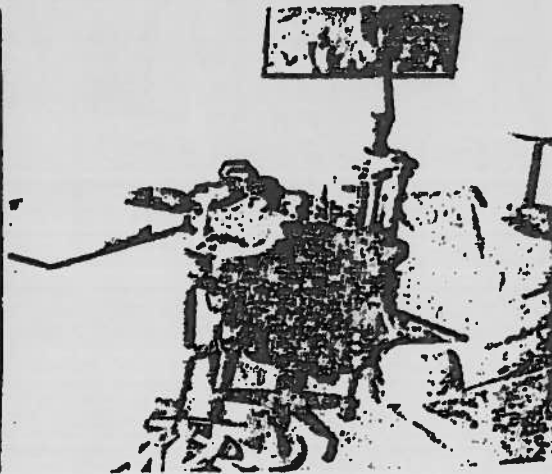
During some of the killings, Dahmer had carried out a form of lobotomy on the victim, by drilling a hole in the head and injecting muriatic acid into the brain, causing almost instantaneous death. He would photograph the

above Jeffrey Dahmer before Milwaukee County Circuit Court, 1991.

below left View of Oxford Apartments where Dahmer lived.

below inside Dahmer's apartment.

opposite Forensic personnel removing evidence from Dahmer's apartment.



process of killing, to view it again later for his own pleasure.

Although upon initial inspection Dahmer's apartment looked clean and tidy, an overpowering smell filled the air. What was discovered inside the apartment was truly shocking. He possessed pictures of the victims, some in erotic poses, which continued through the killing process and culminated in their eventual dismemberment. One complete skeleton was discovered in his bedroom, and concealed in his closet were soft human body parts in a state of decomposition. A decomposing head and other body parts were discovered in his refrigerator. Contained in the freezer were additional heads and body parts, while other body parts were discovered in a barrel. In his statements, Dahmer claimed that he engaged in cannibalism.

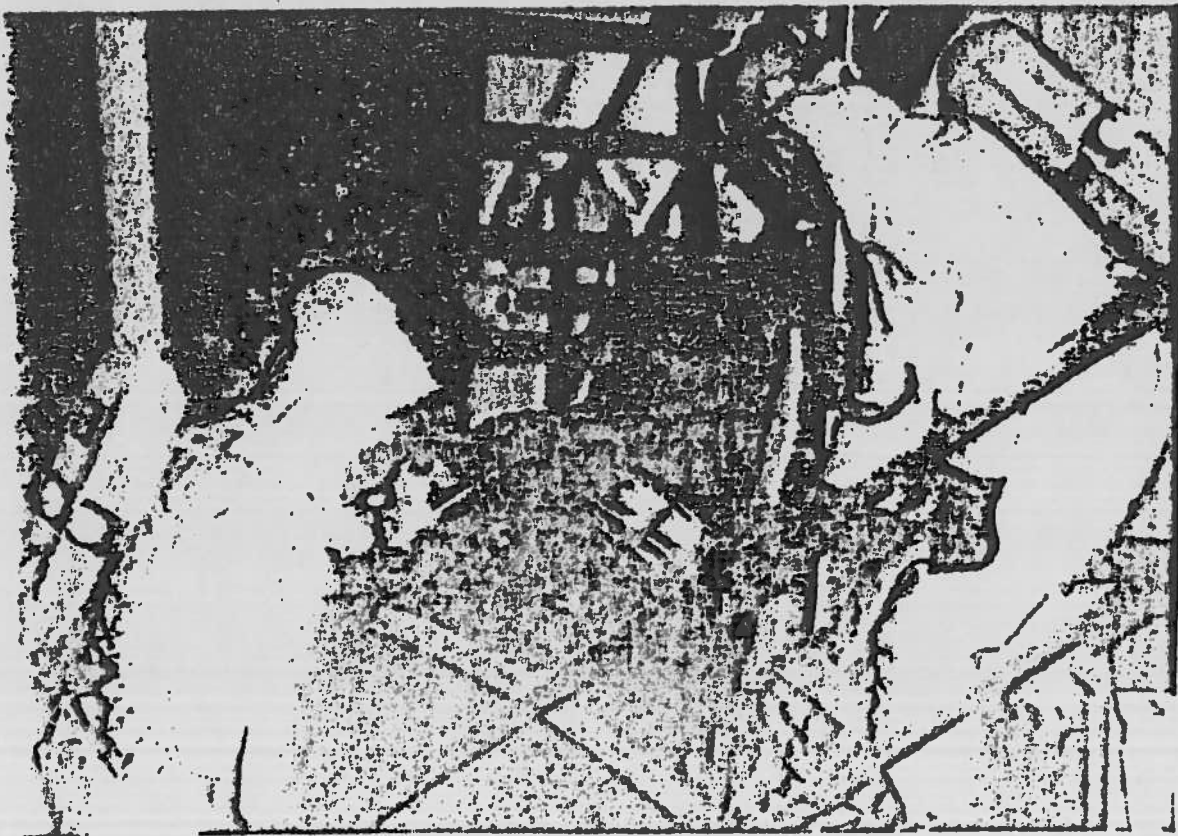
Dr. Bennett, from the University of Wisconsin, was asked by the Milwaukee County Medical Examiner's Office to carry out a forensic analysis of the seven skulls found, including that of the complete skeleton. Some were decomposing with flesh still adhering to them, while others had been cleaned completely, having been boiled to remove the flesh, then prepared afterward. Dahmer's eventual objective had been to create a shrine incorporating the skulls of his victims.

The anthropological analysis indicated that some of the skulls exhibited a small hole in the upper forehead region, where muriatic acid had been introduced. Additionally, the investigation confirmed that all the skulls were male, and of white, Oriental and black affinities. Information gathered by the police during their

investigation was matched with the anthropological analysis in an attempt to identify the victims.

Each skull was also analyzed by a forensic odontologist, Dr. Johnson, who recorded the dental work that each individual had received. With an indication of the possible identities of the individuals, he proceeded to compare his analysis with their dental records and, as a result, he was able to make positive identifications.

Dahmer was convicted and sent to Columbia Correctional Institute in Portage, Wisconsin, to serve a combined prison sentence of 957 years. During the fall of 1994, three years after beginning his jail term, he was attacked by a fellow inmate while carrying out janitorial work. Dahmer's head was crushed during the assault, and he died as a result of the injuries he sustained.



Jeffrey Dahmer

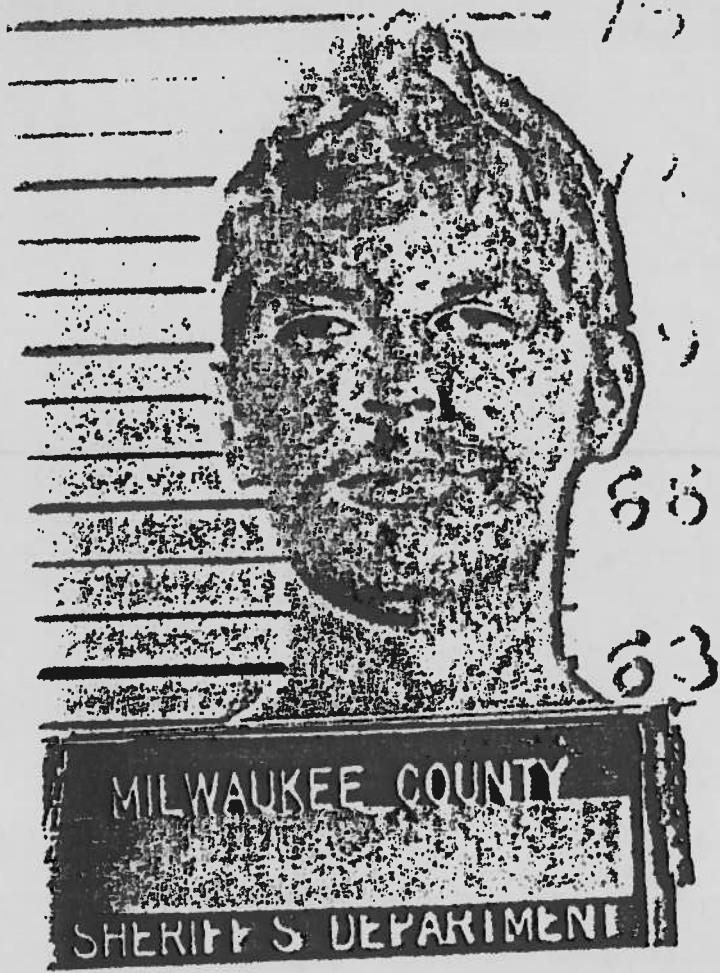
Jeffrey Dahmer led an introverted, but tense, teenage life, which was tinged with alcohol abuse. Eventually, he became a serial killer and cannibal, embarking upon a rampage of death and brutality that lasted for 13 years.

His first crime was committed in 1978 at his parents' home, in the semirural area of Bath, Ohio. The victim was Steven Hicks, an 18-year-old male hitchhiker whom Dahmer had picked up. Dahmer had invited Hicks to his parents' house, since both were away at the time.

After he had had sex with Hicks, Dahmer did not want him to leave so he decided to kill Hicks by striking him on the head with a barbell, after which he strangled him to death. Then Dahmer proceeded to dismember the corpse with a bowie knife. He then placed the body parts in plastic bags and buried them in a wooded area behind his parents' house.

Some time later, Dahmer decided to dig up the plastic bags. He crushed the remains with a sledgehammer and scattered them in the same wooded area. This crime was not discovered until his final arrest in 1991 (see Case study No. 8), by which time he had murdered a total of 17 men.

Following the discovery of Dahmer's activities and his subsequent arrest, the police obtained a statement from him. Dahmer told them about his crimes, including his first murder in 1978. Prompted by the information provided, the area in Bath was carefully searched, and a variety of artifacts, as well as

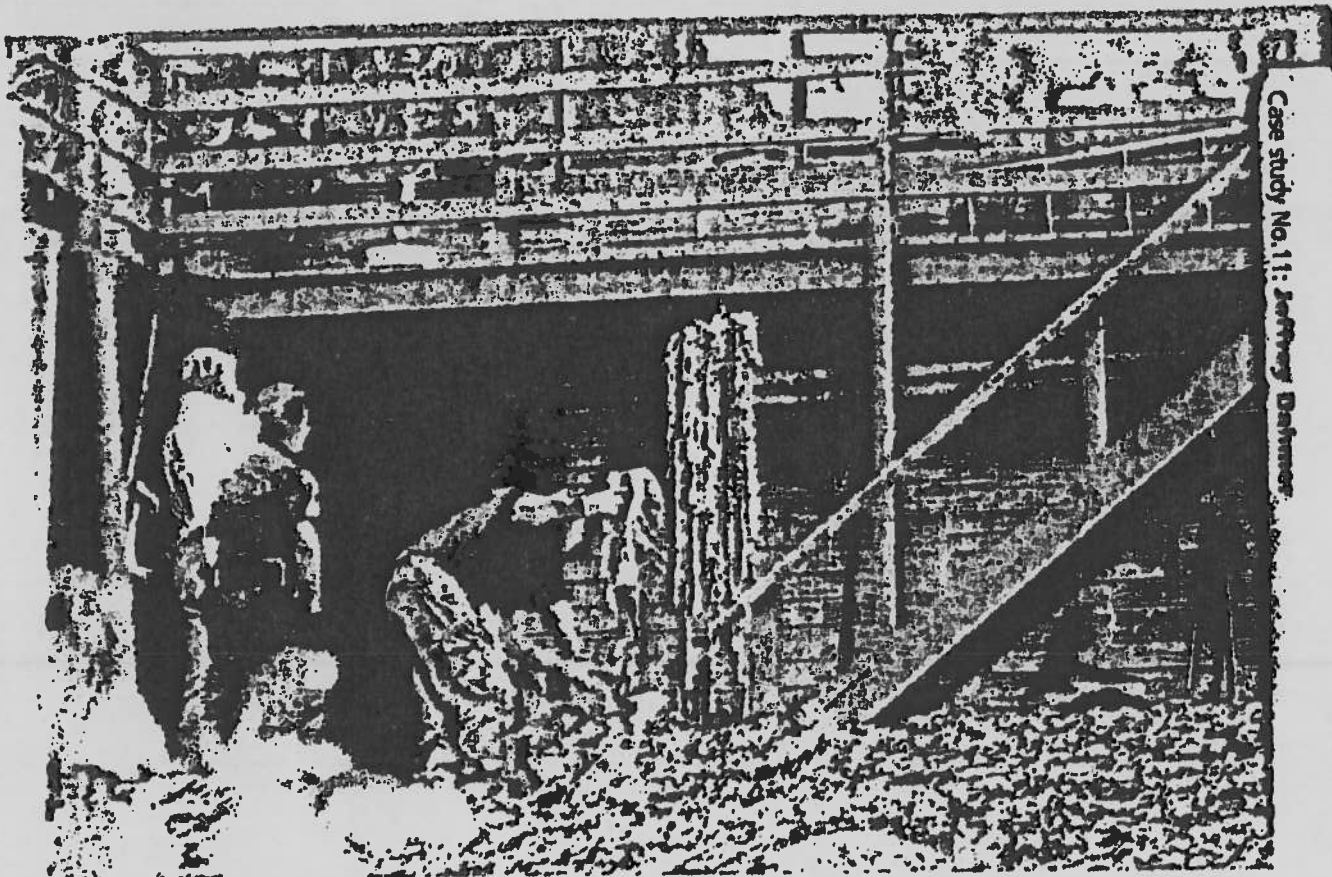


animal bones and fragmented human bones, were discovered. The authorities decided to call in physical anthropologists from the Smithsonian Institution in Washington, D.C., to assist in their investigation.

The material was transported to Washington, where scientists proceeded to analyze it. One of the first steps was to separate the human bones from the nonhuman remains discovered in the same area. The latter were of domestic animals, such as chickens and cows, and wild fauna native to the region.

Eventually, it became possible to analyze the pieces of human bone, which numbered over 250 and which were, in many cases, in an extremely fragmented condition. The first step was to determine whether they had originated from more than one body. The investigators found that no body part was duplicated, indicating that they came from one individual only.

The human bone fragments exhibited cut marks and severe fragmentation, in addition to damage that had been caused by exposure to the elements over



many years. The conclusions reached by the scientists closely matched Dahmer's recollections.

Individual characteristics of the recovered victim matched those of Hicks in age, sex, and height. Additionally, radiographs taken of the victim at some time prior to his

death proved of great assistance, enabling a comparison to be made with those taken after his death. Even though the remains that were analyzed were in an extremely fragmented condition, a positive identification of the victim was possible.

opposite Jeffrey Dahmer after his arrest in 1982.

above Policemen searching for clues at Dahmer's boyhood home in Bath, Ohio, where bloodstained clothing belonging to Steven Hicks was discovered.

below left An official uses a metal detector to search for remains. An assortment of both human and animal bones were recovered.



Genocide

Essentially, the population of Rwanda, a small country in Central Africa, is composed of three ethnic groups: the Hutus, the Tutsis, and the Twa. During Belgian colonial rule, the Tutsis enjoyed a life of privilege, and obtained good jobs and education.

This situation changed during the early 1960s, when the country gained its independence, and the Hutus gained a better position. In 1973, they came to political power for the first time. In 1994, when the Hutu president was killed in an aviation disaster, Hutu extremists accused the Tutsis of being responsible, and the "cleansing" of *Inyenzi* "cockroaches," as the Hutus called the Tutsis, began in earnest. The genocide was carried out for the most part using pangas, machete-like tools widely employed in agriculture. Pangas were used to mutilate, kill, or injure people and stop them from escaping—a victim who attempted to get away would be struck in the ankle area with a panga, severing the Achilles tendon. This would make it impossible for the person to run or walk. Some individuals exhibited defense wounds in the form of cuts to the fingers, which had been received as the victim attempted to shield his or her face. No one was spared, and throughout the country entire families were killed. The fields and streets of Kigali, the capital, were littered with bodies and stained with pools of blood.

Some individuals hid in small spaces in houses, such as between the roof and the ceiling. They would stay there for days on end, with no food or water. Many managed to survive, but others were discovered and were killed. Even when they sought refuge in Catholic churches, they were often trapped inside and murdered.

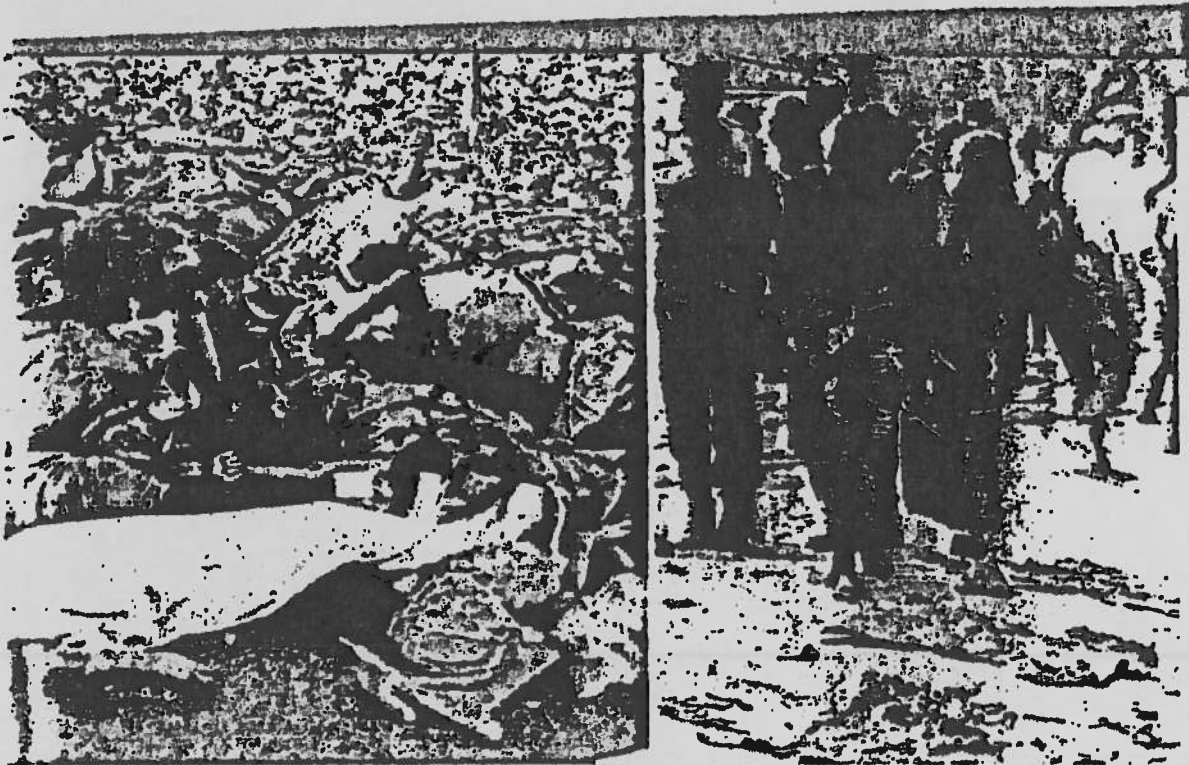
This was the most intense genocide of the 20th century, since it is estimated that around 800,000 people died in a matter of 100 days. The victims were quickly buried in mass graves to prevent diseases from spreading and because this was the most sensible way of disposing of so many bodies. Moreover, since entire families had perished, there was often no one to claim the bodies.

One of the many communities devastated by the genocide was Kibuye, a small settlement on Lake Kivu, in the western part of the country. In 1994, hundreds were killed in the Catholic church and among the forested hills of the area. A few individuals survived the massacre by stealing out at night to search for food and water, then hiding during the day, under the dead bodies that lay in the church.

Eventually, the bodies at Kibuye's church were buried in a

mass grave nearby. Between the end of 1995 and the beginning of 1996, the grave was excavated and the bodies exhumed. The surrounding hills were also searched for bodies. This operation was carried out under the auspices of UNAMIR (United Nations Assistance Mission to Rwanda), with the assistance of Physicians for Human Rights, based in Boston, Massachusetts. Before anything



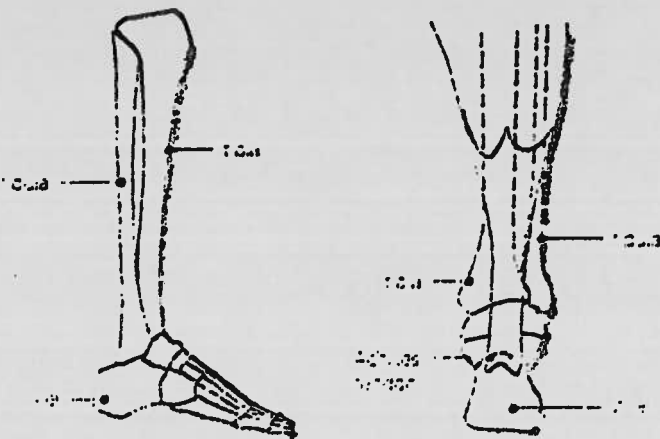


could be done, the area had to be searched for mines, while the individuals involved in the field work were protected by United Nations military personnel.

Many skeletonized bodies of escapees were retrieved among the hills. The mass grave was exhumed using specialized archeological techniques and the bodies of nearly 500 men, women, and children were recovered.

Each body was autopsied by a forensic pathologist, after which the biological profile (age, sex, stature, and any other notable characteristics) was assessed by the anthropologist. Because entire families had been killed, DNA testing was not carried out. Moreover, positive identification with the aid of dental and medical records was not possible, because such records did not exist. Instead,

the clothing retrieved from the bodies and other personal effects found with them were displayed in the hope that someone would identify them. However, few of the items were recognized. Yet the work done in Rwanda made the world aware of the brutality that had taken place during those 100 days, while the people who had been killed eventually received a dignified burial.



opposite A man holds a panga, an agricultural tool used widely in Rwanda.

top left Victims of the genocide lie decomposing in the streets of Kigali.

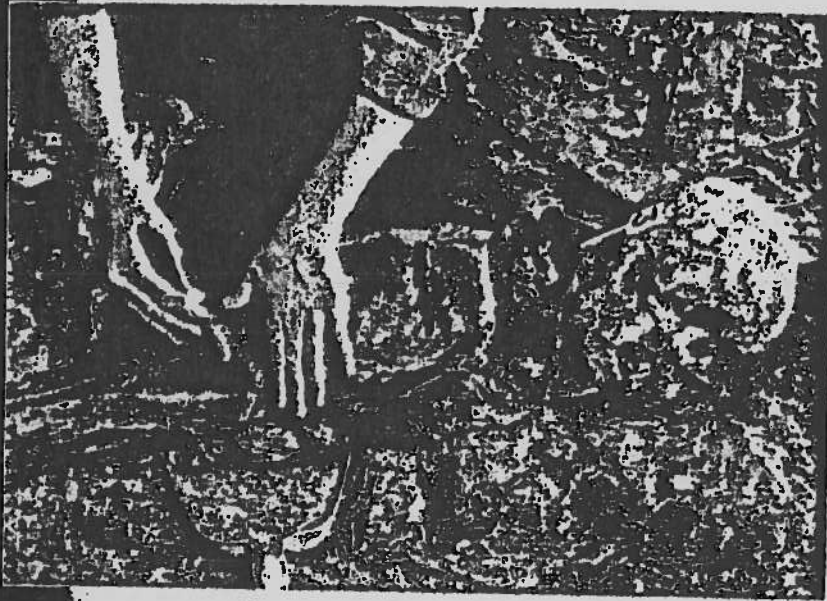
top right The clothes of the victims are displayed in the hope of being identified, at Kibuye's Catholic Church.

left Victims were struck with pangas on the achilles tendon, leaving it to rot from bleeding.

overleaf Skulls in a Rwandan field containing severe trauma.

The Massacres

The Central American country of Guatemala has been home to the Mayan people since pre-Columbian times. Although many of their traditions were modified under Spanish influence, they retained their native dress, cooking techniques, and a culture of respect for their elders.



For a large part of its history, Guatemala has remained in the hands of a few elite families, who have exercised great control over economic and political matters. In 1962, the situation deteriorated when the ruling body attempted to retain control of the country by employing a variety of exclusive and racist actions against the population. This marked the beginning of a series of executions, disappearances, massacres, and various other forms of human rights violation.

In the following 34 years of military control, it is estimated that approximately 200,000 people perished—mainly those of Mayan descent—regardless of sex, age and social status.

One of the many atrocities to have occurred in Guatemala was

the Rio Negro Massacre, which bears the name of the area in which it took place, located 155 miles (250 kilometers) north of Guatemala City. In the early 1980s, it was announced that a massive dam would be built at Rio Negro, as part of the Chixoy Hydroelectric Project. Those who lived in the locality were opposed to the creation of the dam, since the land had been their home for generations and was blessed with a good fertile soil. In exchange for relocating, they were to receive poor agricultural land, which would have been disastrous for a community that depended heavily upon farming.

Several massacres took place at Rio Negro, including one in March 1982. The victims were mainly women and children—the men

had fled the area in an attempt to escape, believing that their wives and children would be safe. The women were raped and killed and the children were smashed against rocks. Afterward, the men responsible for the act dumped the 177 bodies into a ravine.

It was not until 1993 that the bodies were recovered with the participation of the Guatemalan Forensic Anthropology Team. The task took three months to complete, since the recovery of the bodies required time and care, and some had suffered damage from scavenging.

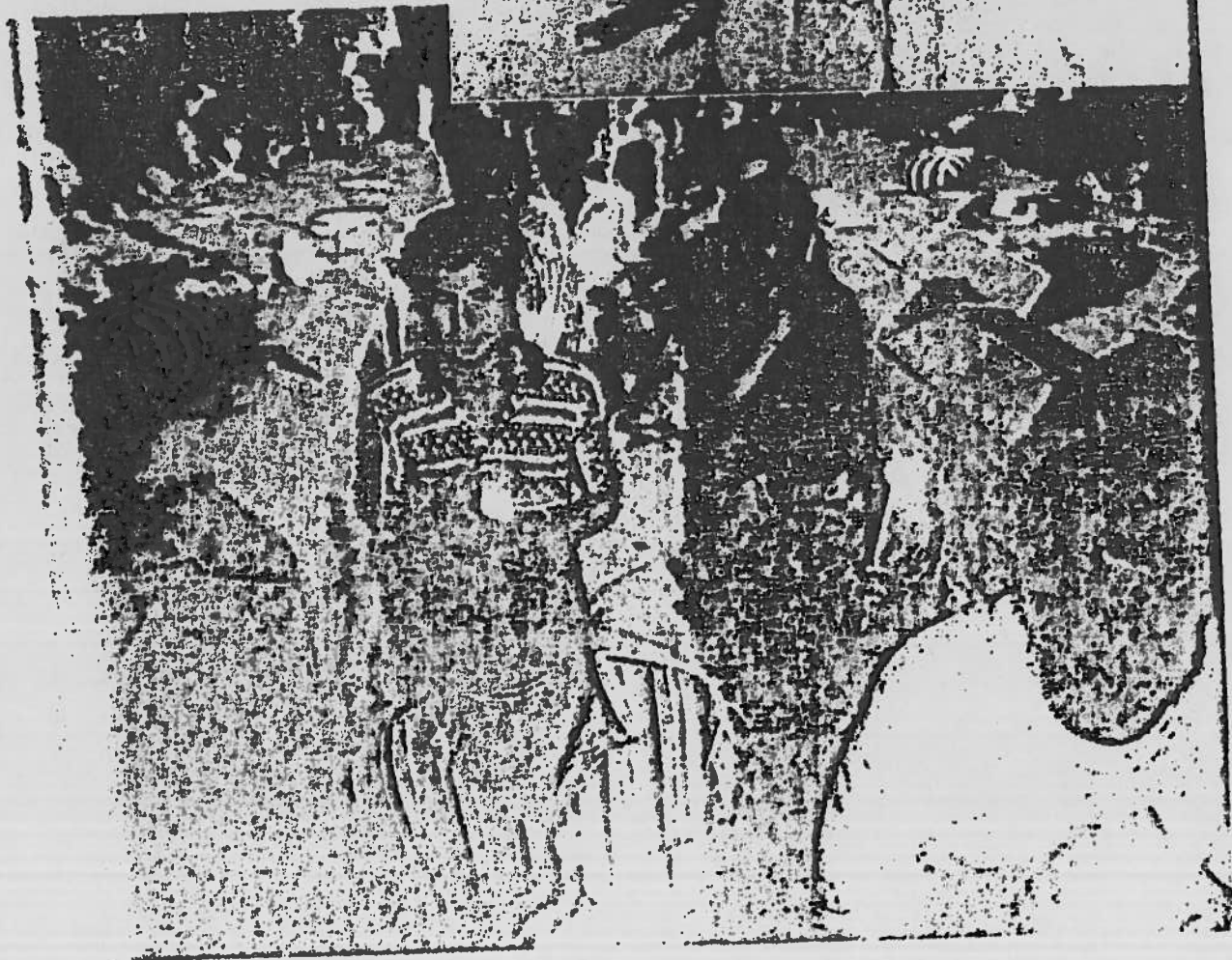
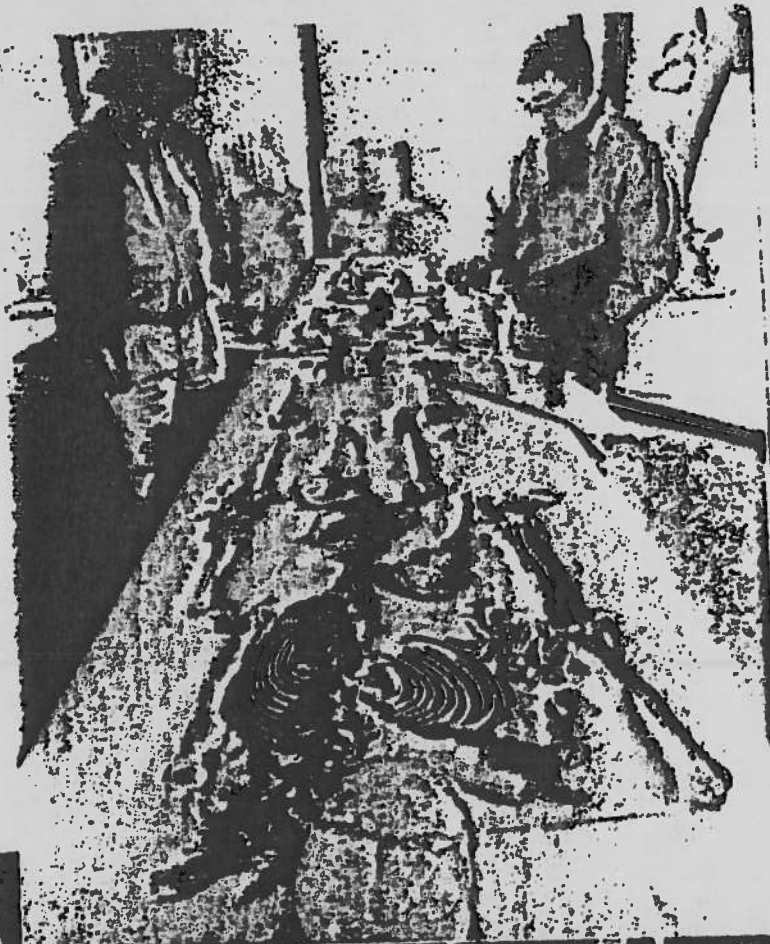
The bones recovered had suffered traumas from blows to the head, and gunshot and stab wounds. Some fetal bones were found, indicating that pregnant women had been killed. The bodies were given a proper burial, accompanied by Mayan rituals.

In total, about 350 people from Rio Negro died in the various massacres. The dam was built, and the survivors from the community were not compensated adequately. Their culture, not only at Rio Negro, but throughout the Mayan community, suffered as a result—traditional rituals are no longer followed and they are obligated to hide their ethnic identity. But despite seeing their people tortured, raped, abducted, and killed, the Mayans have never given up and continue to survive as an ethnic group, gaining strength from their long and proud history.

opposite A forensic anthropologist prepares a skeletonized body before removing it from a mass grave.

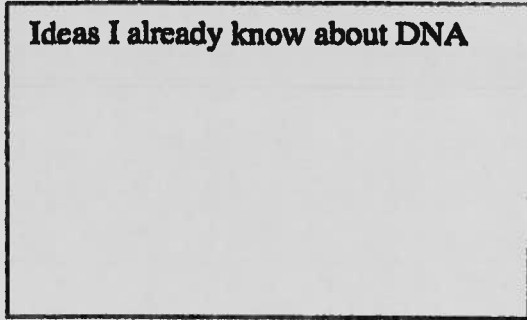
right Dr. Clyde Snow (left) examines the skeletons of victims unearthed from a massacre site in northern Guatemala.

below Mayan Indians take part in a wake combining Roman Catholic and Mayan religious rituals.

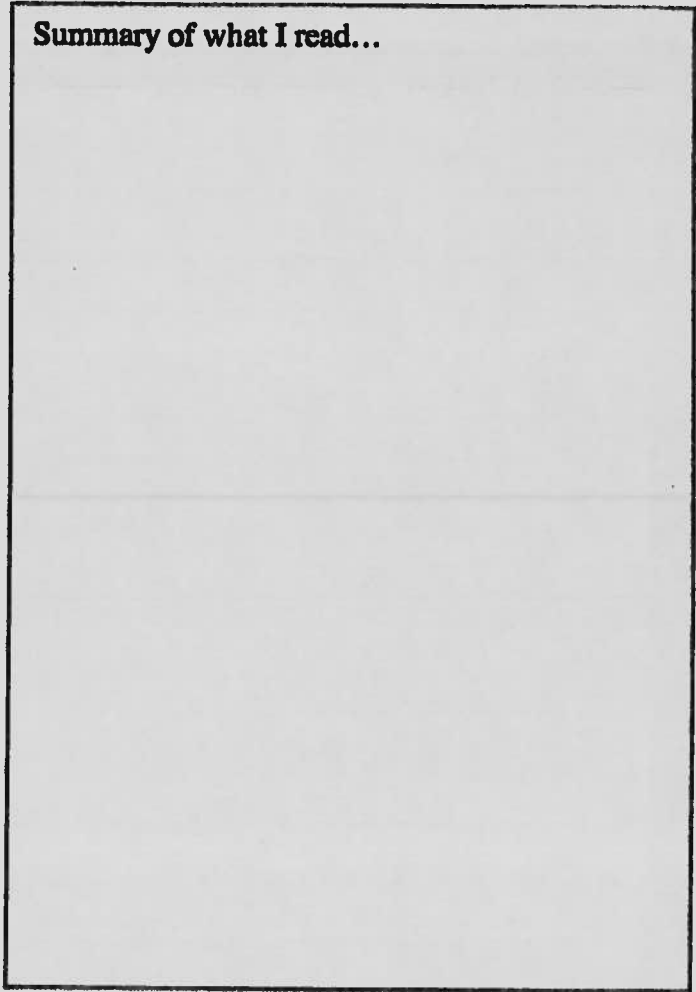


CONCEPT FRAME FOR DNA ON TRAIL

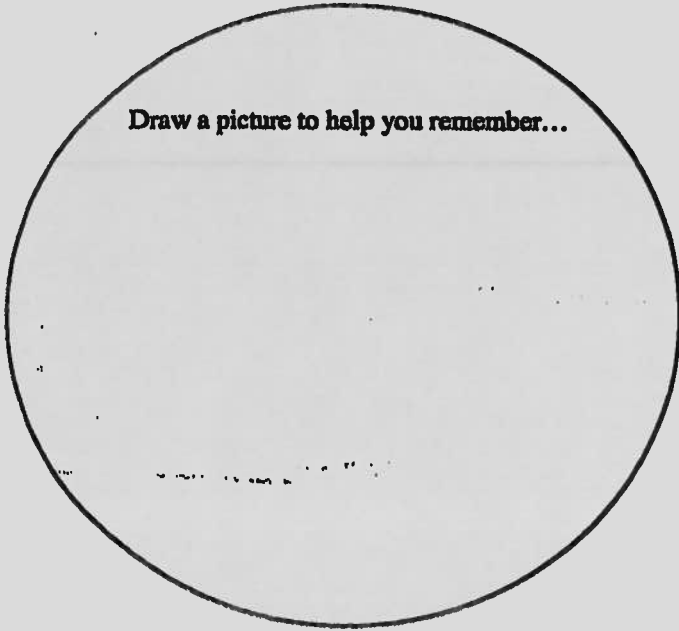
Ideas I already know about DNA



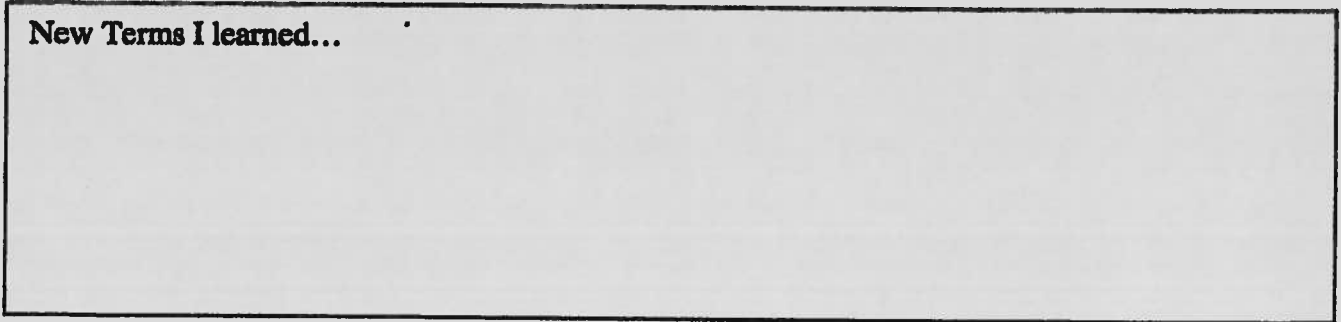
Summary of what I read...



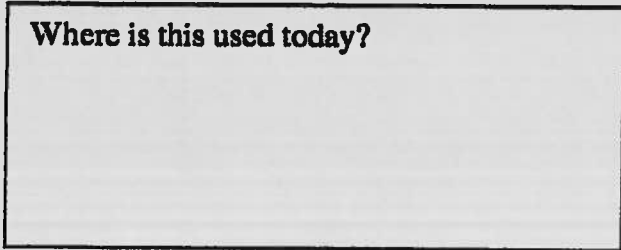
Draw a picture to help you remember...



New Terms I learned...



Where is this used today?



One question I have after reading...

