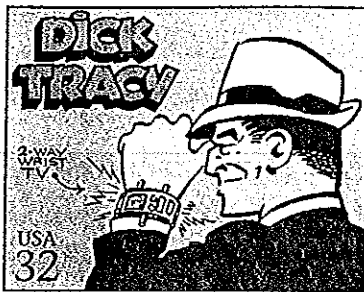


# CRIME BUSTERS



Precious jewels disappear from a museum. Masked gunmen rob a grocery store. A movie star is kidnapped. A computer hacker finds a way into a bank's files. When these and a thousand other kinds of crimes occur, someone has to figure out who committed them. In real life, that "someone" is most often a detective. Detectives are problem-

solvers. They work with many kinds of evidence and have high-tech tools to help them do their jobs. People skilled at analyzing fingerprints, blood, and even tooth marks assist in examining the evidence. But in the end, it's the detective who puts all the evidence together, questions witnesses and suspects, and brings the guilty party to justice.

▲ **IN MOST POLICE** departments, a person wanting to be a detective must first serve as a police officer. Police-force

detectives are often referred to as plainclothes officers because they don't wear uniforms. Detectives work in

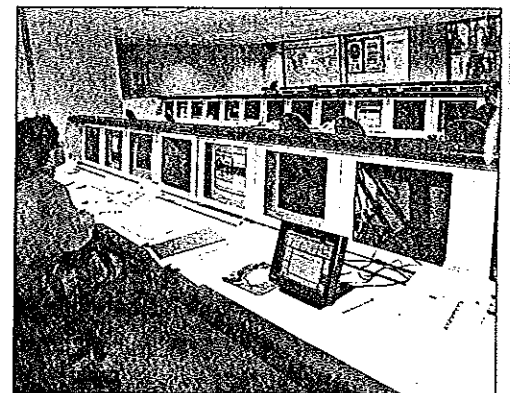
specialized fields that deal with such crimes as murder, robbery, and the sale of drugs. Detective Dick Tracy, star of

a comic strip by Chester Gould that began in 1931, was the good guy against such villains as Flattop and Pruneface.

▼ **THE FEDERAL** Bureau of Investigation (FBI) is one of the world's largest and most resourceful crime-fighting agencies. It is the investigative division of the U.S.

Justice Department and works with state and local police departments to catch suspected criminals all over the U.S. and, more recently, throughout the world.

► **A PRIVATE** investigator has his or her own business and is often referred to as a private eye. Movie fans loved actor Humphrey Bogart in his role as the tough, mistrustful private eye in *The Maltese Falcon*.



► **IN MYSTERY** stories, a detective's most important tool is usually his or her keen eye and brainpower. In real life, a detective also has a support team of scientists and technicians who use such tools as microscopes, lasers, and chemical analyzers to help solve crimes. Above, a



portrait is being sketched on a computer screen at the Criminal Bureau of Investigation in Ohio for use in helping to nab a criminal.



◀ **ANTHONY PORTER**, 43, had been on death row since 1983, accused of the double slaying of a young couple in 1982. In September 1998, two days before he was scheduled to be executed, Porter got the break of his life. Because David Protes, a journalism professor at Northwestern

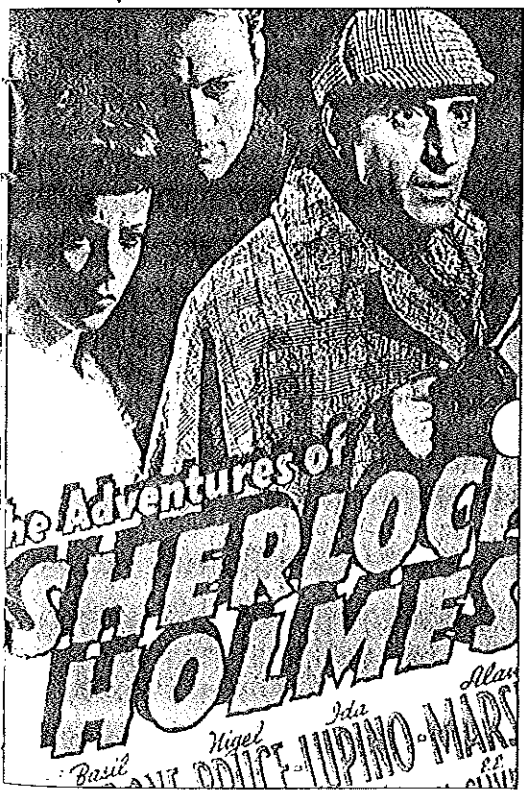
University, and his students were going to reinvestigate the case, Porter was granted a stay. After they reenacted the crime and tracked down witnesses, another man, Alstory Simon, confessed to the killings on videotape. Porter was cleared of the charges and became a free man!

# The Many Faces of SHERLOCK HOLMES in Film

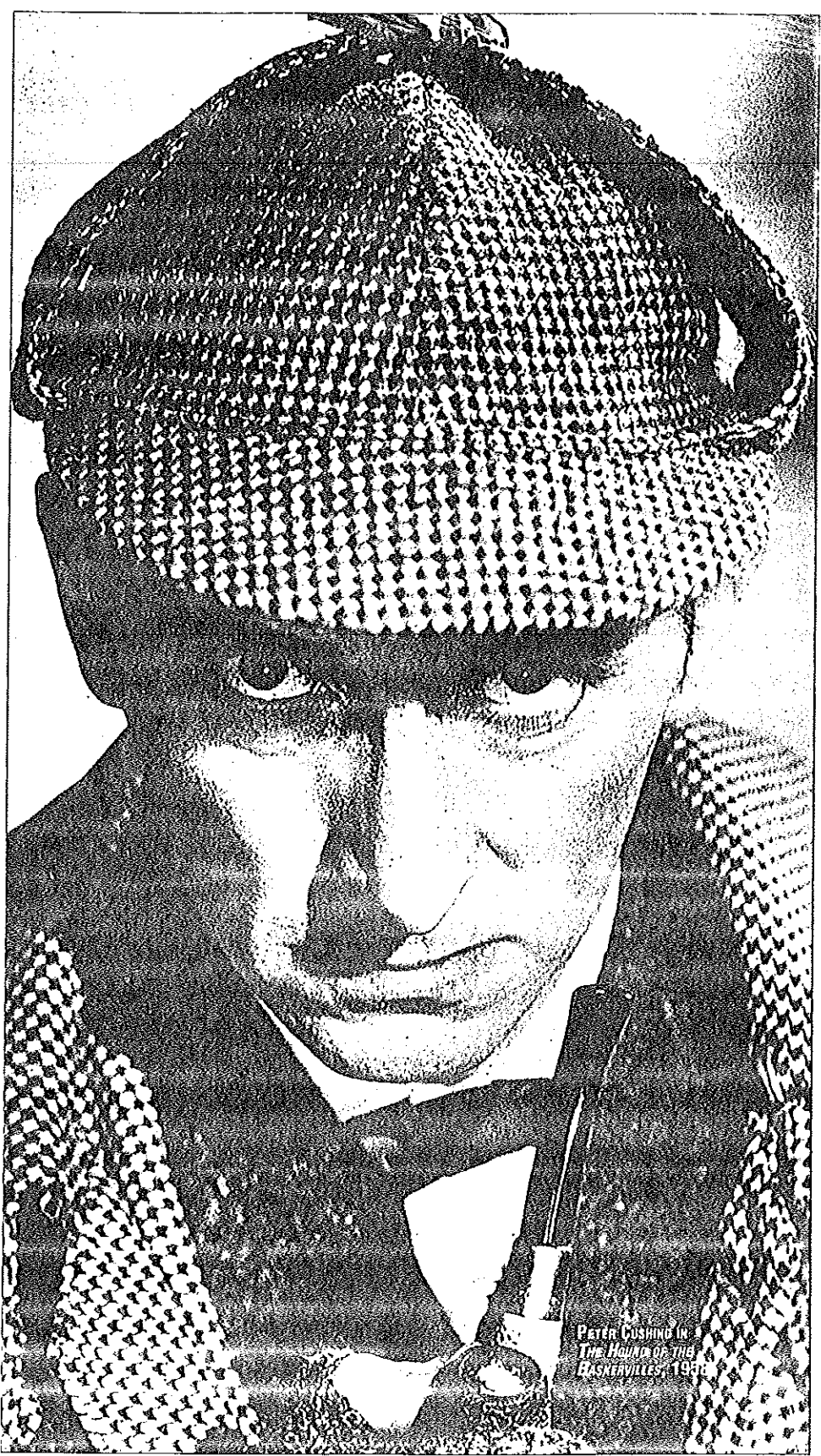
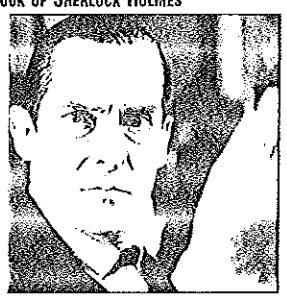
THE BRILLIANT Sherlock Holmes is probably the world's most famous detective in fiction. Holmes depended on clever deductive reasoning to solve his sometimes dangerous and complex cases.



ABOVE: CLIVE BROOK IN *THE RETURN OF SHERLOCK HOLMES*, 1929; BELOW: BASIL RATHBONE IN *THE ADVENTURES OF SHERLOCK HOLMES*, 1939



BELOW LEFT: RAYMOND MASSEY IN *THE SPECKLED BAND*, 1932; BELOW RIGHT: JEREMY BRETT IN THE 1990 TV SERIES "THE CASEBOOK OF SHERLOCK HOLMES"

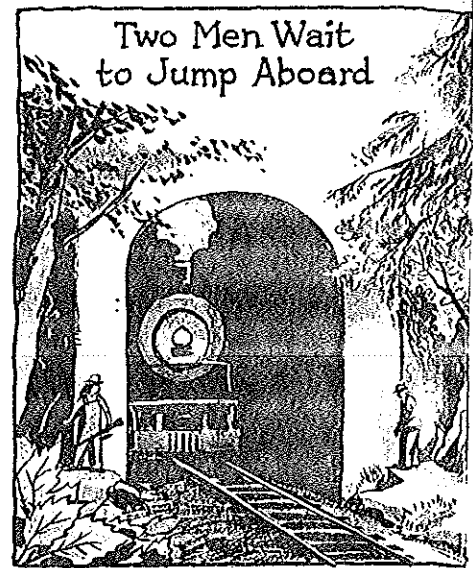


PETER CUSHING IN *THE HOUND OF THE BASKERVILLES*, 1958

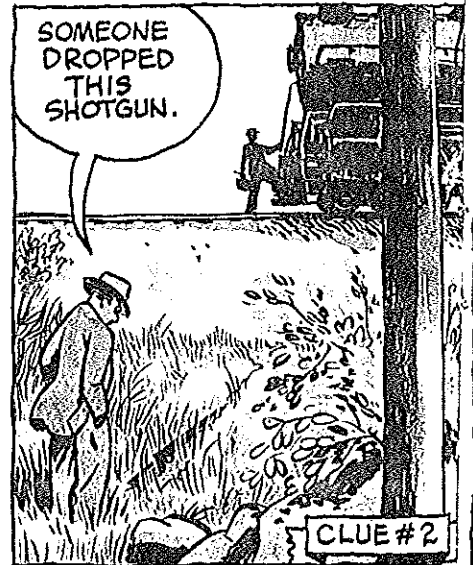
# Whodunit?

How good are you at crime-solving? Get out your trench coat and your magnifying glass. Here's a real-life murder mystery that took place over seventy years ago. Study the facts and examine the evidence. Draw your own conclusions about how this crime was solved. You can begin where the detectives do, at the place where the crime occurred—the crime scene. How much can you learn from the evidence at this scene?

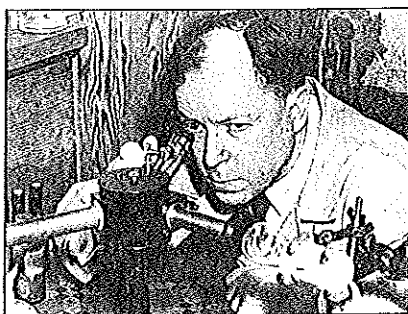
## The Crime



## The Crime Scene



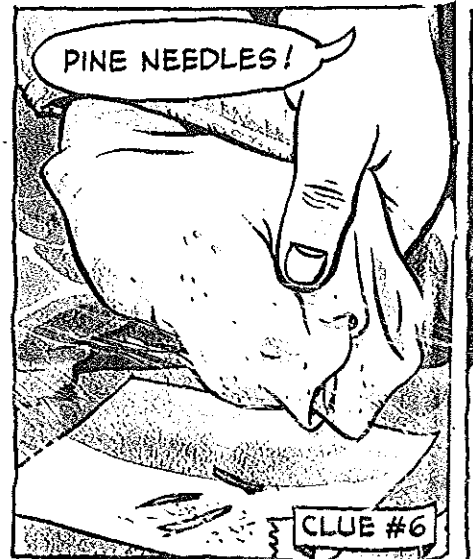
## The Detective on the Case



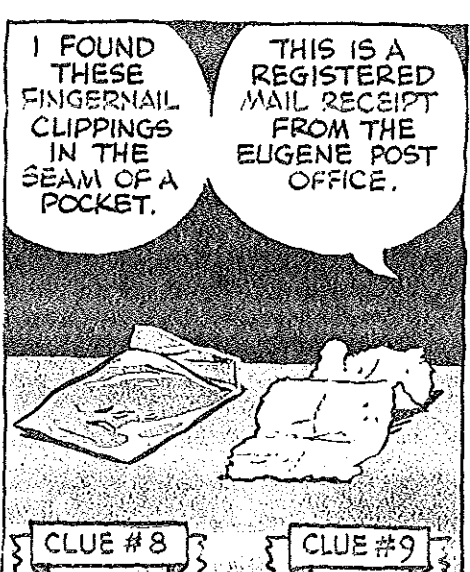
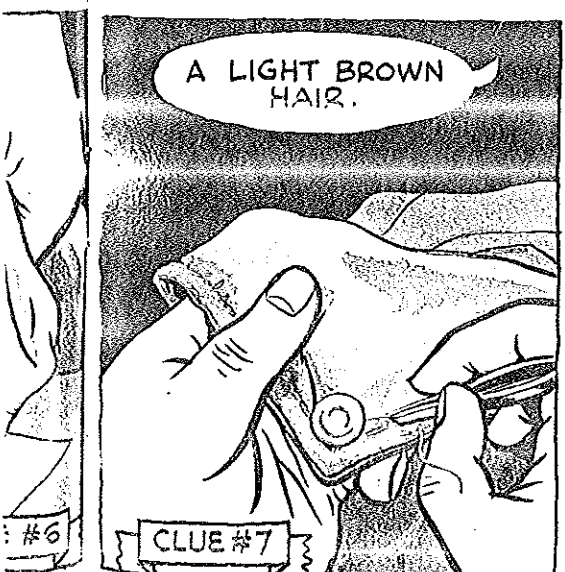
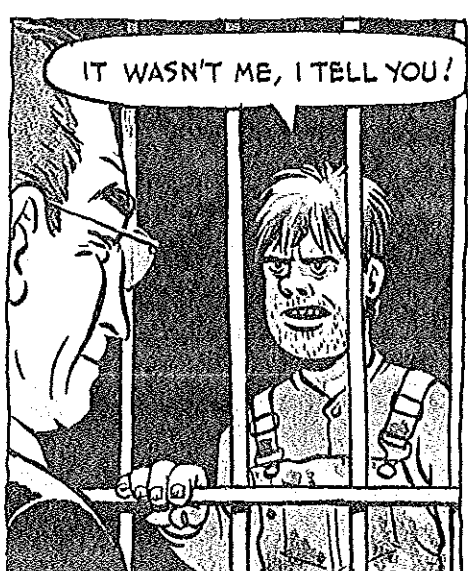
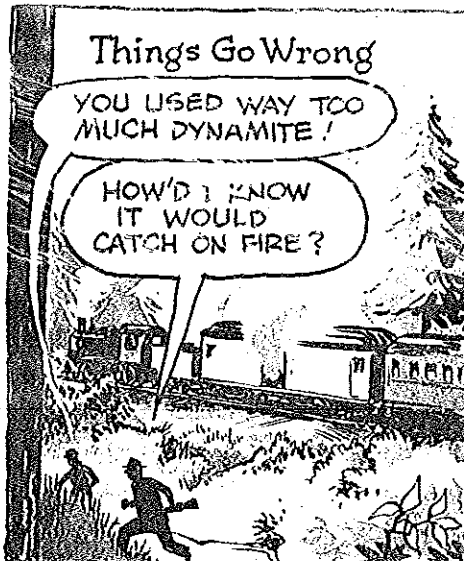
A LOCAL POLICE ARE stumped by the mail car holdup. They call on supersleuth Edward Oscar Heinrich. In his 45-year career, he helped police all over the nation solve over two thousand crimes.

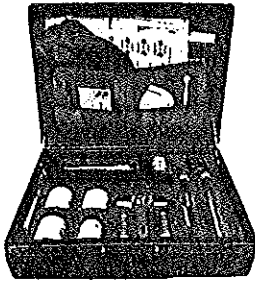
Known as the "Thomas Edison of Crime Detection," he is a private investigator and expert on handwriting, papers, and inks. He also knows a great deal about geology, physics, and biochemistry.

## Heinrich Gathers More Evidence









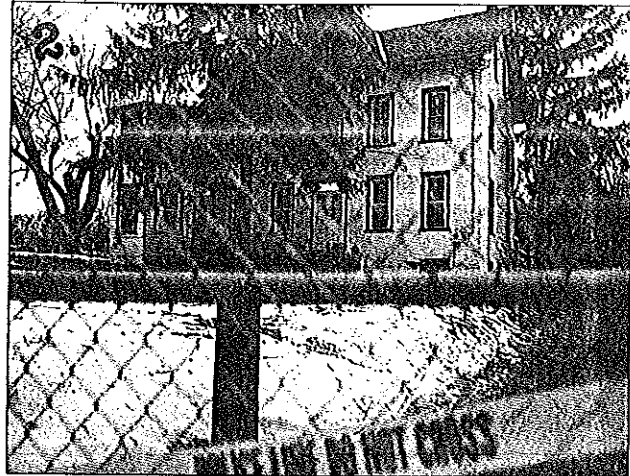
A CRIME-SCENE KIT

## At the Scene . . .

Over seventy years have passed since Detective Heinrich examined the evidence in the Oregon train robbery attempt. The scientific methods Heinrich depended on to crack that case are just as important today. Nowadays, however, detectives rely on the work of many different kinds of technicians and scientists to collect and analyze evidence from a crime scene.



➤ **ONE OF THE FIRST** things police do when they arrive at a crime scene is rope it off so that nothing is disturbed. No one, not even a relative or friend, is allowed in until detectives and the crime-scene team have done their work.



➤ **BEFORE THEY** begin collecting evidence, officers

check and record whether windows are open or shut,

shades are up or down, lights are on or off.

## . . . & in the Lab

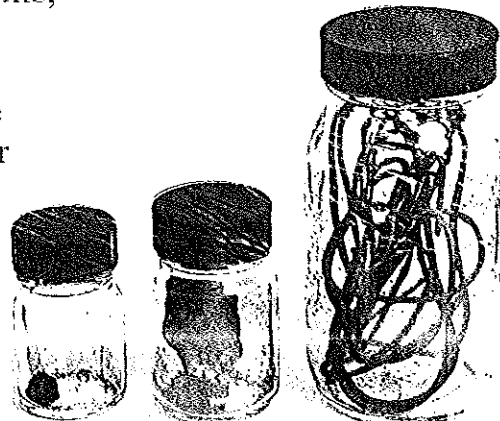
In a crime lab, scientists look for the proof that links a person to a specific crime or for evidence that a person accused of a crime is not guilty. They study bloodstains, bullets, hair samples, fingerprints, clothing stains, paint chips, and many other kinds of evidence. The information they gather helps detectives solve the crime.

▼ **SLOPPY WORK CAN** ruin otherwise good evidence. Crime-scene specialists or detectives put each piece of evidence into its own container, label it, and seal it tightly. In the crime lab, evidence is kept in a

locked room and is handled only by people who have been given permission to do so. Biological evidence, such as bloodstains, is refrigerated or frozen to preserve the chemicals that can be analyzed.

▼ **THE PEOPLE WHO** work in a crime lab are called forensic scientists. They apply their scientific and medical knowledge to evidence in criminal cases. Forensic chemists identify and ana-

lyze drugs, explosives, and other chemical substances. Other forensic scientists identify poisons found at a crime scene or in a victim's body. They also examine blood and other body fluids.



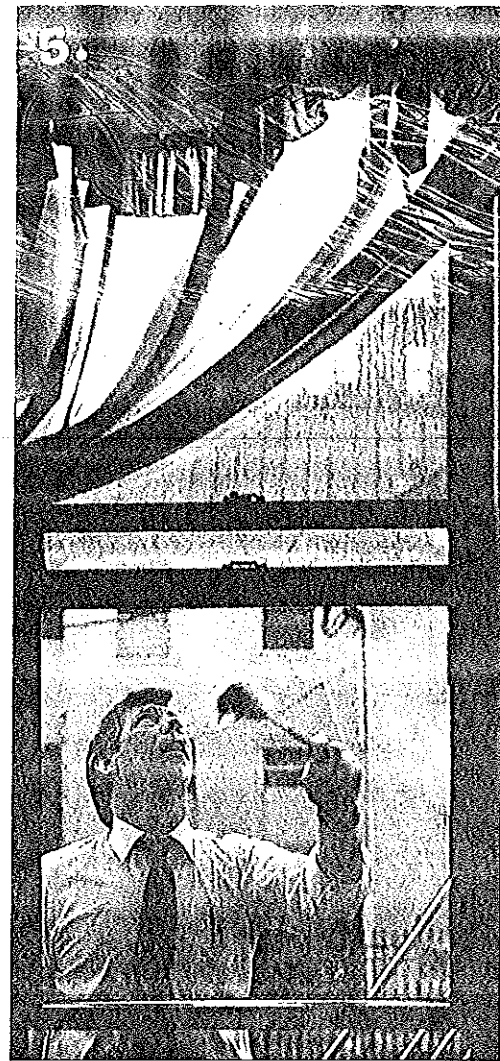
► **AT THE CRIME SCENE**, lights flash and shutters click as photographers take pictures from every angle. Pictures must clearly show the size, dimension, and distance of objects from each other and therefore generally

include a ruler to show scale and to facilitate measurements. Photographers use cameras with special lenses and sometimes special film, which can reveal things not easily seen by the naked eye.

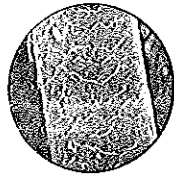


► **TEAM MEMBERS** carefully comb the area for fingerprints. Sometimes, intruders carelessly touch a bathroom sink or the underside of a table. Hairs, cigarette ends from ashtrays, used dishes, or

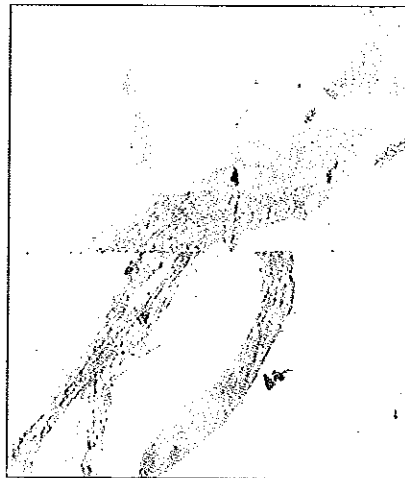
glasses with lipstick or other stains may be taken back to the crime lab for analysis. Smells can offer clues, too. Does the room smell of cigarettes, perfume, alcohol, gunpowder?



► **How much** information can you get from a strand of hair? Plenty—if you use a comparison microscope. With it, the hair of a suspect can be compared with hairs found at a crime scene. An expert looking at a highly magnified hair like this one can tell if the hair fell out or was yanked out. DNA found in hair can be tested to determine if a hair found at the crime scene came from a suspect or victim.



► **At a crime scene**, vacuum cleaners with special filters can gather fiber evidence. Fiber particles taken from clothing or rugs in a victim's home can sometimes be matched with fibers found on a suspect or in his or her car or house.

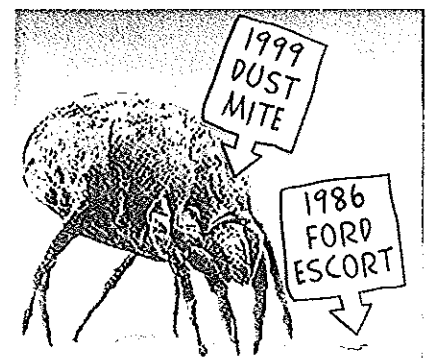


▲ **FIBERS MAGNIFIED** a hundred times under a comparison microscope show two samples. The one above the horizontal line

was found on a suspect's clothing. The one below the line comes from the sweater a murder victim was wearing.

▼ **At the crime lab**, experts use special instruments and X-ray techniques to analyze the tiniest bits of paint. Lasers vaporize paint chips to find out what chemicals they are made of. Paint chips can be traced through

the FBI's National Automotive Paint File, which matches the colors and paint types of thousands of paints used on cars with the make, model, and year of the car. Such evidence can connect a hit-and-run driver to an auto accident.





# Fingering the Criminal

Take a close look at your fingertips. Examine the patterns of loops and swirls made by the tiny ridges. The patterns you see are yours alone, and they never change. Even identical twins have different fingerprints. Because of this, fingerprints are a powerful crime-fighting tool.



◀ **IN BRITAIN, A BURGLAR AND murderer named Alfred Stratton went down in history as the first person to be convicted on fingerprint evidence. Stratton left a fingerprint on the cash box at the scene of his crime. Today, megacomputers can sort through millions of fingerprints in a matter of seconds or minutes.**

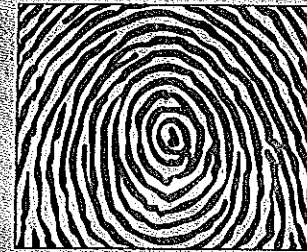
Fingerprints fall into three basic patterns: arches, loops, and whorls. Fingerprint experts also look for such details as ridges branching and crossing.



▲ **ARCHES HAVE A CLEAR ARCH shape around the center.**



▲ **LOOPS CAN START FROM THE left or the right. Two loops, one left and one right, can curl around each other.**



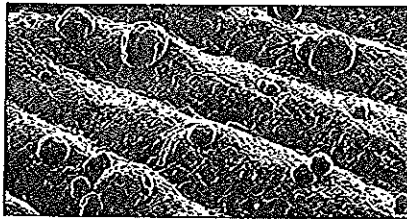
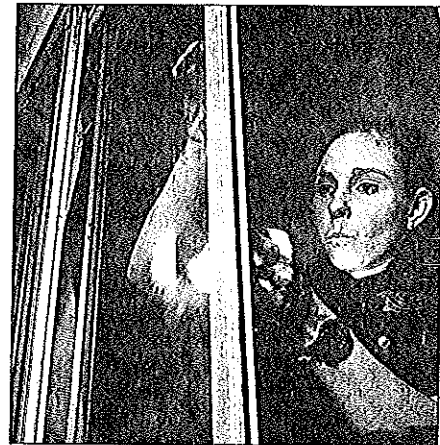
▲ **WHORLS HAVE A FULL CIRCLE in the center.**

▼ **TINY ROWS OF pores line the skin ridges on your fingers. When you sweat, droplets of perspiration coat the ridges. If you**

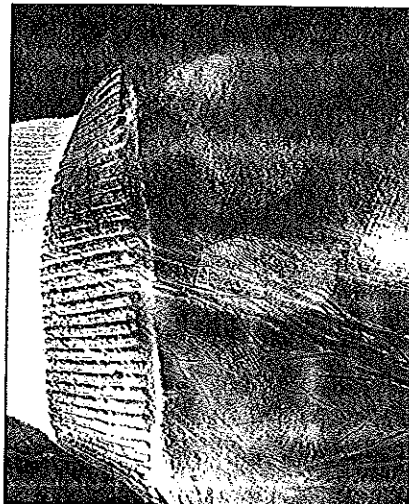
press your fingers against a surface, you leave behind an impression of the ridge pattern. Body oils also help make fingerprints.

► **MOST FINGERPRINTS are invisible to the human eye, but they can be made visible using special powders and chemicals. At a crime scene, investigators carefully dust smooth, light-**

colored surfaces with a fine black carbon powder. Dark surfaces are dusted with a white aluminum powder. The powder sticks to the skin oils left on the surface by the fingers, making fingerprints visible.



► **LASER AND ULTRA-violet light cause fingerprints on such surfaces as cloth or Styrofoam to glow. Objects suspected of having fingerprints are first dusted with a special dye (at right) before the laser light is turned on.**



► **AT A CRIME scene, technicians photograph fingerprints and then remove, or "lift," them using clear tape. From the tape, the prints are transferred to a card with the date, case number, address of the crime scene, and description of the objects on which the prints were**



found. This card contains the fingerprints of infamous Chicago gangster Al Capone.

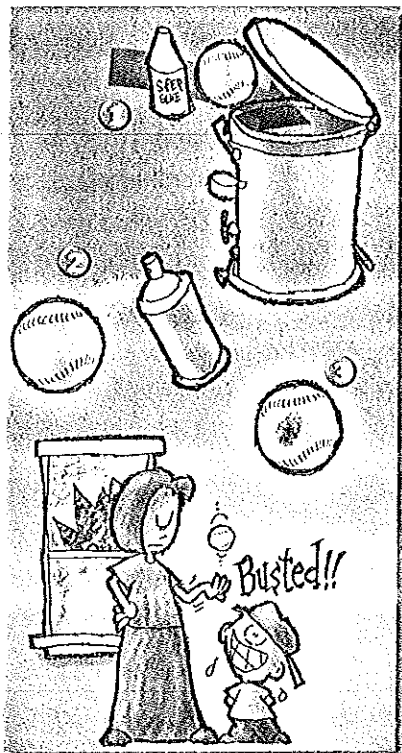
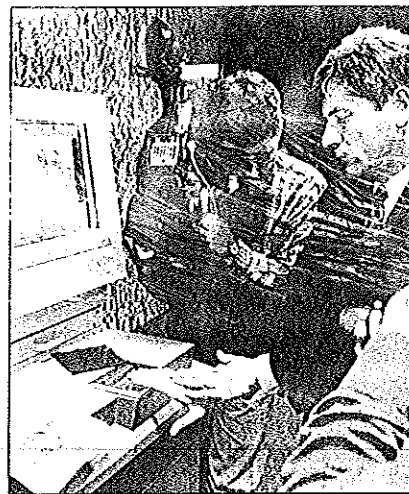


▼ A CHEMICAL known as superglue picks up fingerprints from plastics, wood, aluminum foil, and rubber. The object with the print on it is put into an airtight

container with some glue. Vapor from superglue reacts with chemicals in human sweat to produce a white print. The print is treated with a special dye to make it visible.

► A SUSPECT'S fingerprints can be compared to those at the crime scene. If no suspect is known, crime-scene fingerprints can be scanned into the Integrated Automated Fingerprint Identification System (IAFIS). This high-speed computer system sorts fingerprints by their patterns of loops, whorls,

and arches. Then it compares the information with more than 250 million prints of criminals and civil servants on file and spits out possible matches. When IAFIS systems went online in the 1980s, the average response time for fingerprint matches plunged from two weeks to one day.



► LIKE YOUR fingers, the soles of your feet have unique ridges that never change. Police can use

footprints just like fingerprints to help solve a crime. Fingerprints, palm prints, and

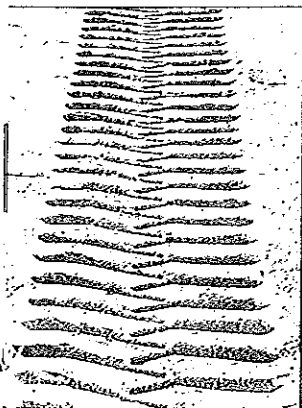
shoe prints are usually photographed with a ruler alongside to show their actual size.



► MANY SHOES today have distinctive ridge markings on the heel and sole to indicate the brand name or to make the shoe better for running or jumping. Wear marks on the soles of shoes may help a detective link the shoe print to shoes belonging to a suspect. This is called a "physical match" because such patterns are unique.



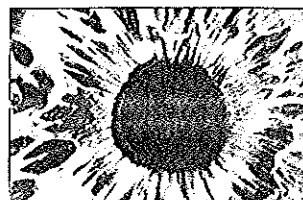
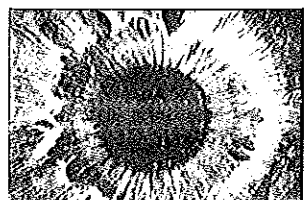
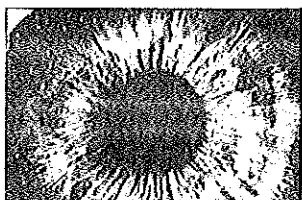
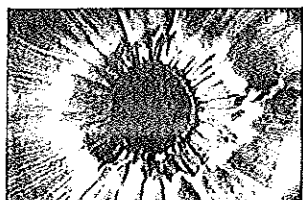
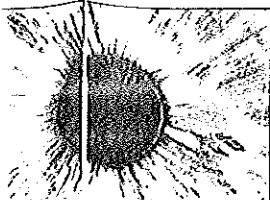
◀ TIRE MAKERS PUT different tread designs on each line of tires. The FBI keeps a record of all such tread designs. The impressions can be compared to a questioned tire, and a match is considered absolute, since wear on a tire is unique.



▼ IN THE 21ST century, detectives will be using new identification systems that compare prints of the pores of the

tongue, and even brain waves. Below are computer screen images of five different eye irises, which have been

scanned as part of a computer recognition program. People's irises are as individual as their fingerprints.



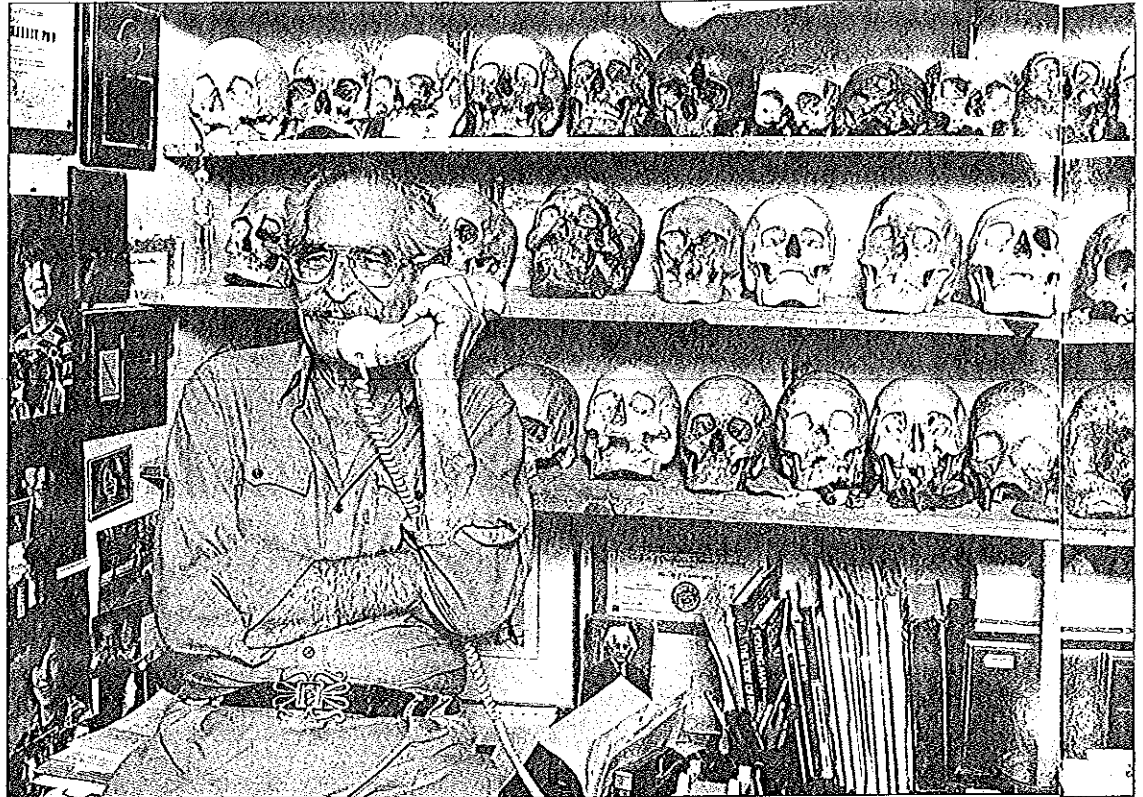


# BITES, BUGS, BONES, and Genetic Blueprints

Forensic dentists, forensic entomologists, and DNA fingerprinting specialists all help fight crime. How?



▲ **WHEN YOU BITE DOWN ON FOOD,** your teeth leave a pattern. Forensic dentists (odontologists) photograph bite marks on bodies or on leftover food at a crime scene to compare them with the bite patterns made by plaster impressions of a suspect's teeth.



▲ **WHEN POLICE WANT** to know the identity of a mystery body, they may turn to a bone detective. Bones provide information about a person's height, weight, race, diet, and injuries or illnesses.

► **EVERYONE'S TEETH** are different. Teeth vary in shape and position. Many people have cavities or fillings. Others have had teeth chipped, pulled, or knocked out in accidents. Forensic dentists use

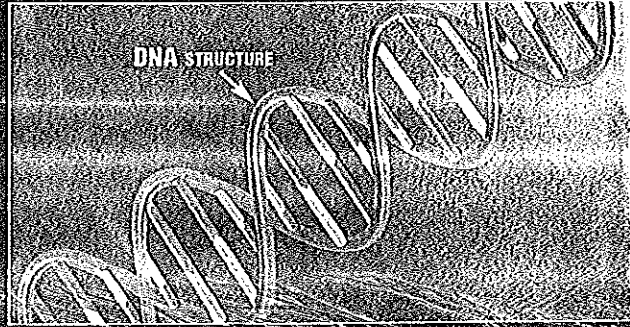
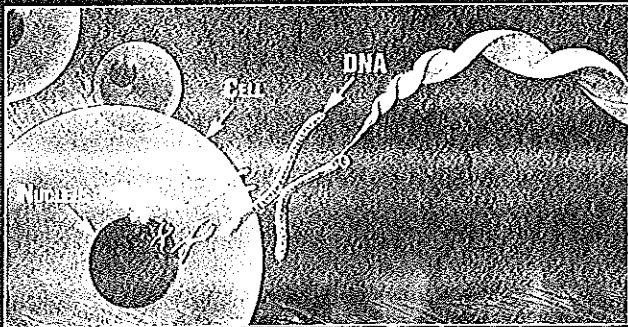
their knowledge of teeth to estimate the age of an unidentified body. Teeth that are worn down on the biting surfaces usually indicate an older person. At about age six, permanent teeth start to



replace baby teeth. The presence or absence of these teeth gives clues about the age of the victim.

## DNA FINGERPRINTING

By comparing DNA evidence collected at a crime scene with the DNA of a suspect, investigators can link the suspect to the crime—or clear an innocent person.



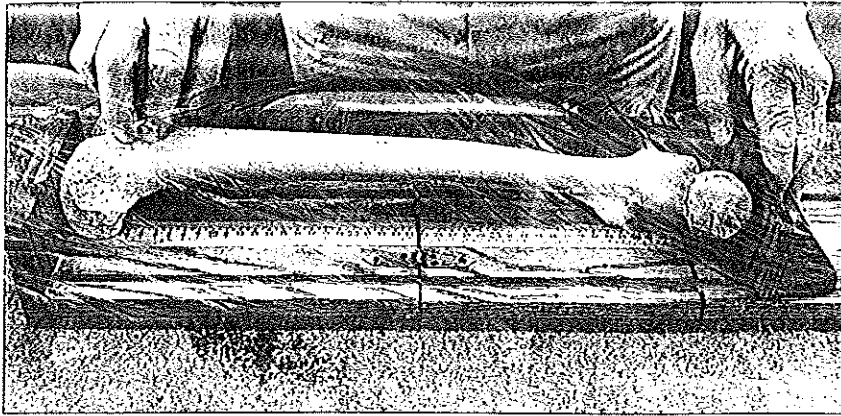
▲ **EVERY CELL IN A** person's body contains DNA (the abbreviation for deoxyribonucleic acid), with only one exception—

the red blood cell. The DNA in one cell is exactly the same as the DNA in any other cell. Blood, hair, saliva, sweat, and skin

contain the same DNA. Everyone's DNA is unique, except for identical twins, who have the exact same DNA.

▲ **A DNA molecule** is made up of long twisted chains of genetic material. These chains hold the blueprint that

determines such things as whether a person's hair is red or brown or black and whether a person is male or female.



▲ THIS IS A BONE board, a tool used to measure long bones like the thigh and upper

arm. Using a special math formula, experts can compare the length of the thigh or fore-

arm bone of an unidentified person to the length of the bones of people whose

height is already known. In this way, scientists can estimate a person's height.

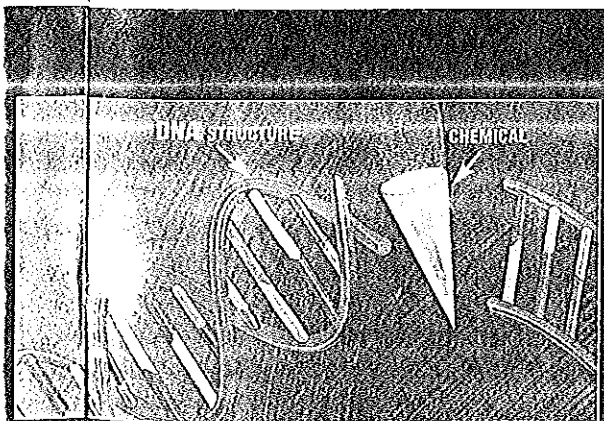
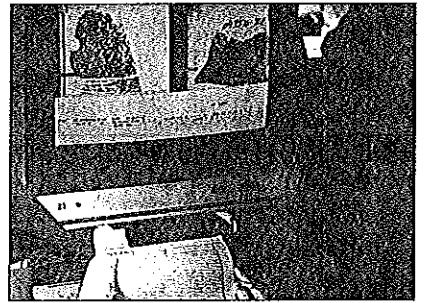
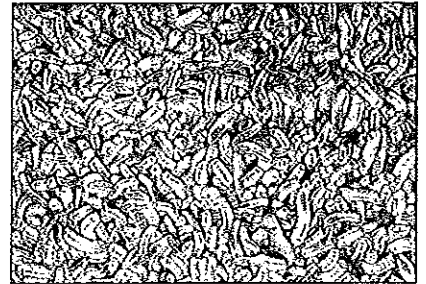
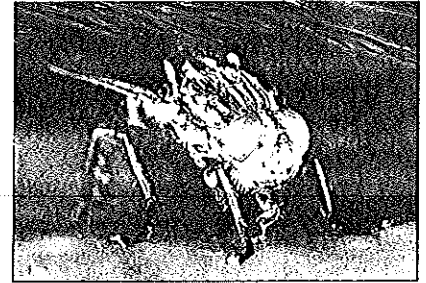


◀ INSECTS FOUND IN Florida are different from those found in Alaska. Insects in a farm field are also different from those in swamps. Sometimes, a forensic entomologist (scientist who specializes in insects) can tell the police when a body has been moved from one part of the country to another, simply by

knowing a lot about insects. An insect detective helped nab a killer who denied being anywhere near the scene of a crime. The detective took dead insects from the radiator and windshield of the suspect's car and proved that the insects lived only where the body was discovered. The suspect was obviously lying.

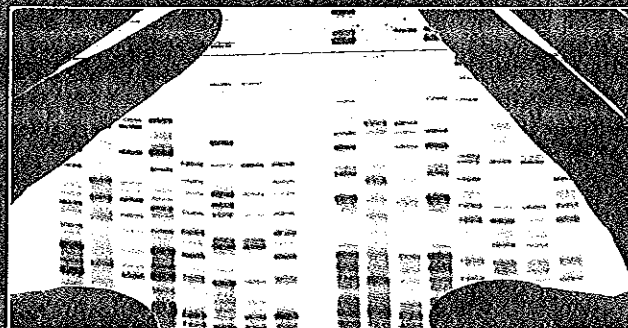
▼ SHORTLY AFTER a person dies, insects, such as blowflies (below), swarm to the scene. They lay eggs that quickly change to larva,

called maggots (below center), and later become adults. By examining these, insect detectives can tell how long a body has been dead.



▲ IN DNA FINGER-printing, scientists use chemicals to remove the DNA from blood, hair, or other living tissue. In the lab, the

DNA is cut into fragments and then split. Radioactive probes and X-rays help complete the process to make a DNA fingerprint.



▲ THE FRAGMENTS form patterns of parallel bands. Since there are more than 10 billion billion possible patterns,

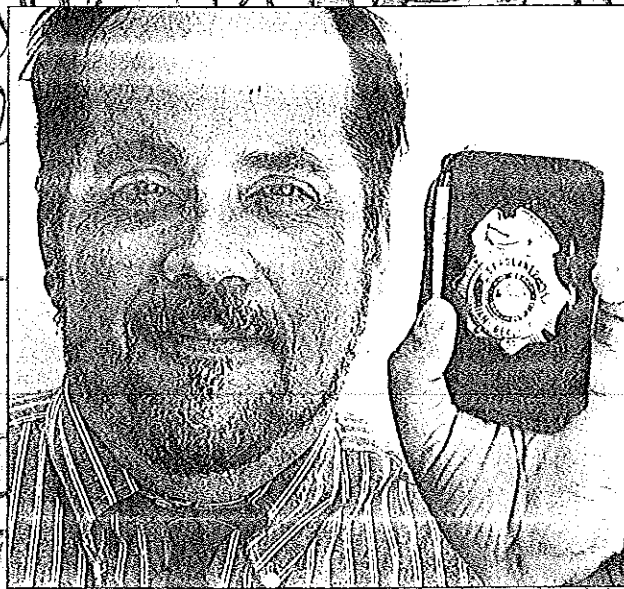
it is very unlikely that one person's DNA pattern would match someone else's. That is why DNA is important in

solving crimes. Experts have taken DNA from sweat stains on headbands and saliva on glasses and cigarette butts.

▲ IN OCTOBER 1988, the FBI announced that it had opened a national DNA database that would make it possible to compare a DNA sample from a suspect or crime scene in one state with all other states' DNA data. Since Britain started its DNA database in 1995, it has matched 28,000 people to crime scenes.

## Meet Detective Fata

Sergeant Louis Fata (pronounced Fay-tah) has been a police officer for 18 years. He works in Miami Beach, Florida, a city of roughly 95,000 people. For the past eight years, he has investigated many different kinds of crimes, including missing persons, murders, gang crimes, and complaints against police officers. His beat is the entire city.



### WHAT MADE YOU DECIDE TO BECOME A POLICE OFFICER?

It's a chance to help people. My sister was a police officer in Florida, and my grandfather was a police officer in New York City.

### WHAT IS THE JOB OF A DETECTIVE?

Detectives follow up on any crimes that uniformed officers can't solve while at the scene. If no suspect is on the scene or if the officers aren't able to catch a robber quickly when a house is broken into, the case is assigned to a detective like me. For example, a person comes home and finds her TV and stereo are gone. The patrol officer asks for the crime-scene team to come check for fingerprints.

### WHAT DO YOU DO BACK AT THE OFFICE?

I check to see if fingerprints recovered at the scene match up with known criminals. I also question neighbors to see if they spotted any strange cars parked in the driveway. If the owner of the TV or stereo has kept the serial numbers, I can enter this information in a national computer database so that the stolen goods might be recovered. Then I sift through all the evidence and see where it takes me. I follow up wherever leads I have.

### WHAT DO YOU DO AT THE CRIME SCENE?

I work with crime-scene technicians, telling them what to pick up and what to photograph. In a bank robbery, I may go to the scene to

see where the criminals entered the bank. I look to see if they left a cigarette end behind. Did they drop anything coming to the crime scene or as they left? In one

case, a crook threw his gun into a sewer a few blocks from the scene when he saw a police car coming. Police recovered the gun and used it as evidence.



**WHAT MAKES A GOOD DETECTIVE?**

Someone who can think on his feet, someone who can be a good officer, the ability to solve problems and enjoy doing it. You have to check fingerprints and other evidence and talk to witnesses. You have to put many small parts of a puzzle together to solve crimes. You have to be good at talking to people. You have to get as much information as you can from witnesses and victims to catch the criminal. You try to make the people you interview feel at ease so that they will tell you what they know.

**DO YOU NEED ANY SPECIAL SKILLS TO QUESTION A SUSPECT?**

When you question a suspect, you have to see if you can get evidence that can be used in court to prove his or her guilt. You need patience to question a suspect. Most people don't want to confess to a crime. But if you're patient, if you just take your time, if you have enough facts, people will admit what they have done. It may take you an hour, four hours, or three days, but in many cases, the suspect will want to talk and may, sooner or later, plead guilty.

**DO YOU WORK ALONE?**

Hardly ever. Within the department, two or three detectives work as a team. We also depend on other law-enforcement agencies to work with us.

**WHAT IS THE WORST PART OF YOUR JOB?**

Not being able to help a victim when there are no witnesses and no evidence.

**IS IT A GLAMOROUS JOB AS SHOWN ON TV?**

Generally not, but it does have its moments. Most of the time, you're in the office reading reports and making phone calls, trying to find

witnesses, and then taking statements from victims and witnesses. I spend much of each workweek going over crime-scene information and typing up my reports.

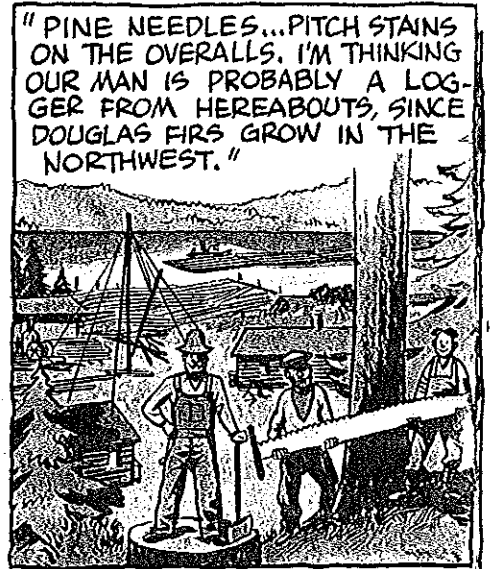
**WHAT IS THE BEST PART OF YOUR JOB?**

The most rewarding thing for any detective is solving the case, identifying the guilty person, catching the perpetrator, and putting him or her in jail. Sometimes, we can recover some stolen items. I know that if I'm lucky enough to solve a crime, I'm going to make the public safer by taking the criminal off the streets.

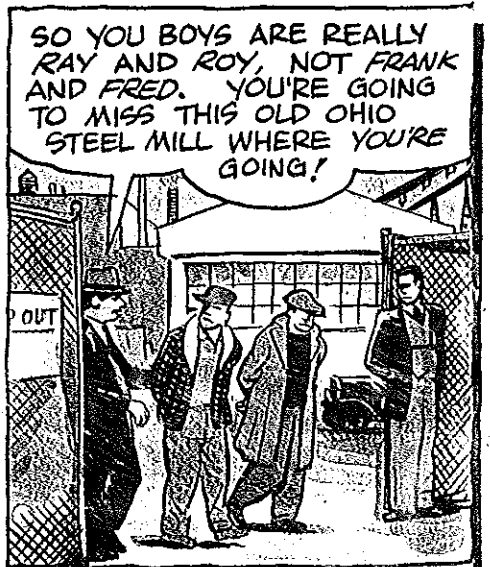
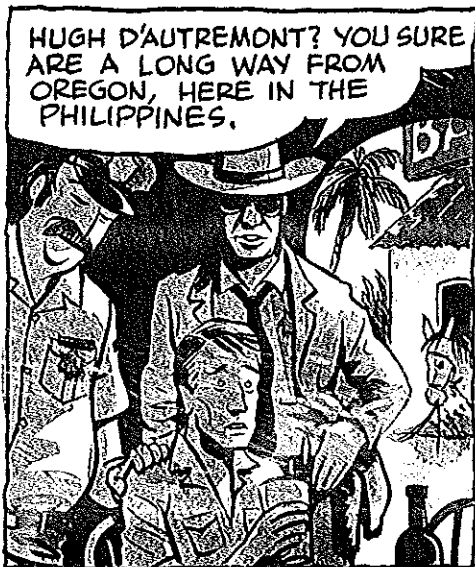
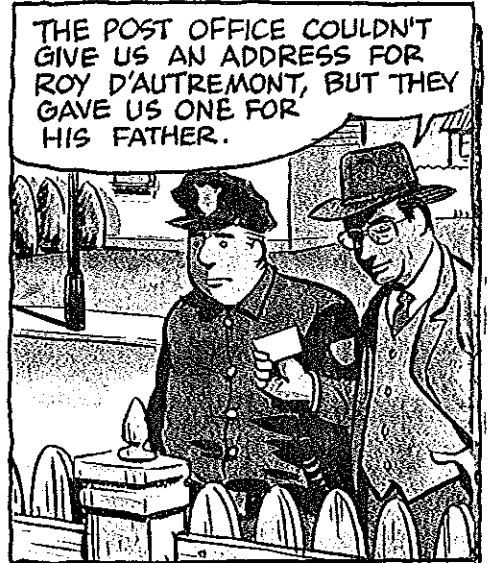
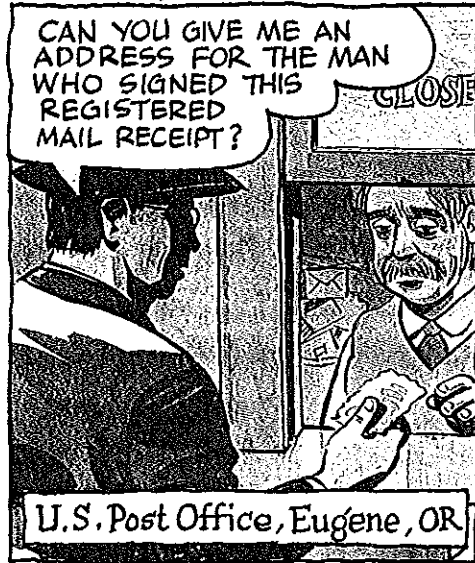
# CASE Closed!



Time's up. Have you figured out how Detective Heinrich knew what at least one of the suspects looked like? Do you know how the crime-scene evidence helped him? Heinrich did put the local detectives on the right path, but there was still a long way to go. More than three years went by before detectives finally cracked the Oregon train robbery case. Even after they knew the names of the criminals, law-enforcement officials spent half a million dollars searching for them. Here's how the mystery was unraveled.



## What Happened Next



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