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The Smoking Gun Squad

LAPD's Firearm Analysis Unit helps
solve crimes by inspecting,
testing and comparing
firearm evidence.

SEE PAGE 6

Doreen Hudson, Assistant Director,
LAPD Crime Lab, in the Firearm
Reference Collection Room,
the department's storehouse
of firearm samples.

Alive! photo by Summy Lam.



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LAPD SCIENTIFIC INVESTIGATION DIVISION:

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- Serology/DNA
- Latent Print Unit
- Firearm Analysis
- Polygraphs
- Electronics
- Photography

Doreen Hudson, Asst. Director, LAPD Criminalistics Lab, in the Firearm Reference Collection Room, Firearm Analysis Unit.





LAPD
CSI:LA

The Smoking Gun Squad

LAPD's Firearm Analysis Unit helps solve crimes by inspecting, testing and comparing firearm evidence.

Alive! photo by Summy Lam

LAPD SCIENTIFIC INVESTIGATION DIVISION:

Firearm Analysis **CSI:LA**

The Smoking Gun Squad

LAPD's Firearm Analysis Unit helps solve crimes by inspecting, testing and comparing firearm evidence.

Photos by Summy Lam, Club Director of Marketing

An integral part of the LAPD's crime-solving powers is its Firearm Analysis Unit, headquartered at the Scientific Investigation Division's space in the Herzberg-Davis Forensic Science Center on the campus of Cal State Los Angeles. (The Firearm Collection library pictured on the cover is housed in a location the department asks be kept undisclosed.)

The Mission of the Firearm Unit

The Firearm Analysis Unit performs examinations and comparisons of microscopic markings on fired bullets and cartridge cases, serial number restorations, renders firearms safe, scientific field investigations of shooting scenes and provides expert testimony in court. The FAU enters evidence submitted for image capture and search in the National Integrated Ballistics Information Network (NIBIN) database to compare other crimes or firearms in the NIBIN database.

Administrative Breakdown

The Firearm Unit is divided into three details:

- **Crossfire Detail:** staffed by Police Officers, support staff and a reservist. This detail is charged with performing the mechanics of creating and entering samples into the NIBIN database. They examine, identify and test fire confiscated firearms that are in questionable or normal working order. They enter evidence and test fire specimens into NIBIN and perform tedious search correlations and NIBIN-based comparisons.
- **Comparison Detail:** staffed by Criminalists, support staff, reservists and consultants. This detail performs microscopic comparisons of fired bullets, cartridge cases, shot shells, firearm test fires and other types of firearm evidence. They chemically test suspected bullet holes for transfers of gunpowder and other bullet residues at crime scenes and in the lab. They identify prohibited firearms and mechanical alterations made to otherwise legal firearms and test them for their operability.
- **Academic Detail:** staffed by Criminalists and support staff. This unit performs all training of personnel new to the unit; restoration of obliterated firearm serial numbers; test fires of rifles and shotguns for NIBIN entry; field response for shooting crime scenes; and methodical completion of practical exercises and exams.

Additionally, the administration provides management and oversees all data and signs off on all official forensic reports.

The FAU primarily serves the LAPD Geographic Area Detectives, Force Investigation Division, the Detective Bureau, and the District Attorney's Office in that order. Although violent crime and homicides have trended downward, 85 percent of all homicides in Los Angeles are committed with a firearm. Detectives have tasted the success of solving serious crimes including homicides by connecting them (using firearm evidence) to less serious shooting crimes. This success continues to fuel the interest and demand for service from the FAU.



Daniel Rubin, Criminalist, compares evidence under a microscope.

Background

Over the past 16 years, the Firearm Analysis Unit (FAU) of the LAPD's Scientific Investigation Division has developed into an active investigative partner with detective personnel of the LAPD. After an intensive external audit conducted in the late 1980s that revealed deficiencies within the former Firearm and Explosives Section, staffing and productivity decreased to record lows. The FAU was effectively closed for business. In January 1990, the FAU received 37 requests for service. In 1991, independent contractors were hired to perform casework and train fledgling Criminalists. Eventually, as quality results emerged from the FAU and credibility with detectives and prosecutors was re-established, the workload demand on the FAU steadily increased.

Another critical factor of the increase in service demand is attributed to the database systems. Drugfire, the unit's original database, was introduced to the FAU in 1993. This added another component of workload (examining, test-firing and imaging confiscated, semi-automatic handguns) and added emphasis to firearm analysis of evidence not previously considered worthy (not solvable) of lab submission. The database created an effective "open file" for solving cases. In the early 1990s, there was no firearm evidence database, and cases submitted to the FAU were typically limited to Officer Involved Shootings (OIS) and homicides.

By 1994, there were six Criminalists, six independent Contractors, six Criminalist trainees and one Supervisor. Five Police Officers were assigned to the newly formed FAU Drugfire Detail, and all

semi-automatic pistols were routinely test-fired and imaged into the database along with crime scene evidence. Drugfire and its sequel, the National Integrated Ballistics Information Network (NIBIN), forever changed the role of forensic firearm labs and elevated the investigative value of firearm evidence from every shooting incident. Case submissions to the FAU began to escalate steadily. In 2001, the NIBIN system became the networked database, and Drugfire became a stand-alone database in the LAPD. NIBIN offered a bullet system in addition to cartridge cases and this further increased workload demand.

'Walk-in-Wednesdays'

In 2003, the disproportion between service demand and staffing levels prompted the FAU to launch the "Walk-in-Wednesday" program. In this program, detectives are invited to walk their crime scene casings into the FAU (by appointment) and wait while they are subjected to a cursory examination and imaging into the databases. Within hours of their visit, detectives are contacted by FAU personnel if their evidence is linked to any other evidence or firearm in the system. These links are preliminary results but provide meaningful clues to investigators starved for useful information. Eighty-five percent of these links or "potential" matches are subsequently confirmed by conventional time-consuming comparison microscopy. Furthermore, 68 percent of the cases walked into the FAU are linked to another crime or gun in the database. The preliminary, tentative information tends to suffice for the early investigative phase of the case, and so this information is shared with the investigators pending confirmation. But the full analysis process is required to file charges and prosecute defendants.

Workload

Presently, the FAU is backlogged more than 600 test-fires that have yet to be imaged into the national NIBIN database and more than 2,700 firearm comparison cases. This backlog spiked after the implementation of NIBIN in 2001, when bullets were added to the capacity of the database system. The bullet capability prompted the need to expand Crossfire to incorporate revolvers and revolver evidence into the protocol. In spite of the increased workload, the Crossfire Detail was not expanded until 2003. By that time, the backlog of test-fires had climbed to more than 1,500. It reached a record high of 1,900 in September 2004.

The Firearm Analysis Unit (FAU), like many other forensic disciplines, has experienced an increase in demand for service. Judges, attorneys and jurors, once ignorant of forensic science, now have an expectation of a scientific investigation to support every police investigation. This has steadily increased workload in the FAU beyond that previously seen in this unit. Television programs like *CSI*, *NCIS*, *Crossing Jordan* and *Forensic Files* fuel the internal and external interest in forensic analysis. Furthermore, the addition of firearm

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METHODS

The Business of Analyzing Firearms

The LAPD’s Firearm Analysis Unit goes about investigating evidence in the following ways:

Laboratory Exam Room

The firearm analysis typically starts here: The morning batch of firearm evidence is received, and the process of analyzing each begins. On a typical working day, 20 to 25 firearms collected as evidence are brought here for investigative analysis. Weapons are separated according to type and test-fired by the Crossfire Detail. In parallel, other FAU staff determines the type of analysis requested of them, inventory their evidence packages, create a work plan and the evidence moves on.



Here are below: Doreen Hudson, Asst. Director, Criminalistics Lab, demonstrates to Club CEO John Hawkins how firearm evidence, part of actual case-work, is processed in the Laboratory Exam Room.



Jessica Bullock, Criminalist, 1 year of City service (left), is in training to become a Firearm Examiner. Here, she’s preparing fabric evidence as part of a real case. Here, she’s preparing fabric evidence as part of a real case, safeguarding against the contamination of evidence. (See her doing the actual fabric analysis under “Gunshot Residue Room.”)



Solved!

These three cases, recalled by Doreen Hudson, were linked by the Firearm Analysis Unit.

This successful scenario, with details supplied by the LAPD, illustrates the impact on detective operations of the Walk-in-Wednesday program:

On Feb. 14, 2004, Jorge Lua, an innocent bystander, was shot to death by an unknown assailant in the midst of a shootout between rival gangs in 77th Division. Several hours later, in another part of 77th Division, an armed gunman opened fire on a crowd of people outside an after-hours club. Three people were injured by gunfire, and 14-year old Gregory Gabriel was killed. Witnesses overheard the name “Carlos” and observed the color and make of the shooter’s car. This information was insufficient to successfully identify and locate the shooter. However, both cases were walked into the Firearm Analysis Unit (FAU) for direct imaging immediately after the crimes occurred as part of the unit’s Walk-in-Wednesday program, where the two shootings were linked. Detectives from 77th Division walked in other shooting crimes for the next two weeks without success, hoping to match them to the Lua and Gabriel murders.

In a separate event, 20 miles away in West Los Angeles, a witness, testifying in a criminal trial against a member of the Argueta family, was intimidated by the family’s courtroom vigilance and menacing facial expressions. During the course of the trial, the civilian witness became the victim of a drive-by shooting in Southwest Division. He recognized Carlos M. Argueta as his assailant. West Los Angeles detectives walked in their cartridge case evidence, and the link was made instantly to the murders of Lua and Gabriel. Within hours, homicide detectives from 77th Division were involved in the arrest and apprehension of Carlos Argueta and his fellow taggers for the murders of Lua and Gabriel, in addition to the attempted murder of a witness. The link was confirmed within 48 hours, and charges were filed under special circumstances that will include the death penalty for Carlos Argueta. Neither detectives from West Los Angeles nor 77th Division had any idea that their cases were connected.

The Walk-in-Wednesday program can provide links in real time while cases are under active investigation and the criminals are actively involved in serial crimes. The feedback loop is less than 48 hours, and this enables the LAPD to cut the crime spree short and save lives. A traditional approach with conventional methods of firearm examination performed weeks and months after the crime has occurred would be ineffective and jeopardize public safety.

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database systems including the National Integrated Ballistic Information Network (NIBIN) and Drugfire have dramatically increased demand for service. The FAU has tripled in personnel over the past 12 years. However, demand for service has increased ten-fold. In 1991 the FAU received an average of 16 new requests per week, but in 2004 the average was 78. Furthermore, the FAU currently test-fires and images an average of 100 guns

per week compared to zero in 1991; this is in addition to the assessment of prohibited firearms, type and caliber analysis and conventional microscopy of fired cartridge components in a laboratory setting. The unit processes an average of 100 “Walk-in-Wednesday” cases per month and conducts 15 to 20 field calls per month. The average training period for a Criminalist aspiring to become a firearm examiner is five years.

Sub-disciplines

The field of Forensic Firearms is painted with a broad brush and includes many sub-disciplines that differ from the next. The chemical etching and restoration of obliterated serial numbers is distinctly different from the examination of bullet holes in clothing, cars, walls and human tissue for determining the proximity of a firearm based on gunshot residues. Likewise, the microscopic comparison of toolmark striae differs widely from the identifica-

tion of assault weapons or fully automatic firearms. Trajectory analysis, database entry and management, mechanical assessment of firearms for operating condition, and assessment of components for silencers, pen guns, etc. are examples of the diversity of sub-disciplines within the field of Forensic Firearms. All of the analysts in the FAU are tasked with performing all of these various applications with competing customers and deadlines. This creates a significant operational challenge. ■

LAPD SCIENTIFIC INVESTIGATION DIVISION:
Firearm Analysis

CSI:LA

Lab Cubicles

Surrounding the Laboratory Exam Room are cubicles where evidence processing and training take place.



Nettie Woiwode, Criminalist, 2 years of City service, is in training on long guns, focusing especially on the marks they leave on spent shells.



Elements used in firearm training.



Jack Seror, Criminalist, 1 year of City service, is going through a training exercise to determine what kind of weapon most likely fired a particular bullet. This is an academic training exercise, not an actual case.

Firearm Reference Collection Room

The LAPD maintains a large reference library of weapons for testing purposes. Analysts who need to research what kind of features and toolmark signatures a particular model of firearm produces come here and check out the appropriate firearm. They then take it to one of the bullet recovery rooms, fire the weapon, and return it.

The Firearm Reference Collection Room contains thousands of guns that can be used to create sample ballistics or other products.
Note: The location of the Firearm Reference Collection Room is not being disclosed.



Jessica Bullock, Criminalist, 1 year of City service, examines a shirt in an ongoing case for bullet entry and exit holes. She has placed a marker with the letter "A" where she has determined the bullet punctured the shirt. With her is Club CEO John Hawkins.

Gunshot Residue Room

Finding and analyzing gunshot residue – often gunpowder – from fabrics is an important step in establishing facts of the case. This room is specially equipped to manage a range of materials while keeping the Criminalist safe from other elements that might be present in the fabric, namely, blood or other bodily fluid.

NIBIN Room

In this room, evidence (either a bullet, shell or cartridge) is digitally scanned and then entered into the NIBIN database. NIBIN stands for the National Integrated Ballistics Information Network. Using a database of bullets, shells and cartridges – and the telltale marks on them made in the act of firing – has completely revolutionized firearm analysis, according to Doreen Hudson, the Assistant Director of the LAPD Crime Lab. The NIBIN database operator tries to match scanned evidence with a test fire sample that's already stored in the database. After a Police Officer – all those who perform this NIBIN work in the Crossfire Detail are full Police Officers – scans the bullet, shell or cartridge and enters it into the database, possible matches start coming up in a matter of minutes.



Manny Tarango, Police Officer, 28 years of City service, enters an image of a cartridge into the NIBIN database.



A bloody shirt, evidence in actual casework.



The Business of Analyzing Firearms

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Walk-in-Wednesdays

This innovative program, where the Firearms Analysts accept detectives who are working on a particularly hot case, scan and input the evidence into the NIBIN database, and disclose any possible match to the detective as soon as possible. All analysis must be triple checked and go through the slow and methodical comparison stage before it can be considered definitive and usable in prosecution, which can take a much longer time. But the Walk-in-Wednesday program allows partial matchup information to be relayed back to the officer to help expedite an open case where time is of the essence. This program, which the LAPD pioneered, has been copied by many police departments.

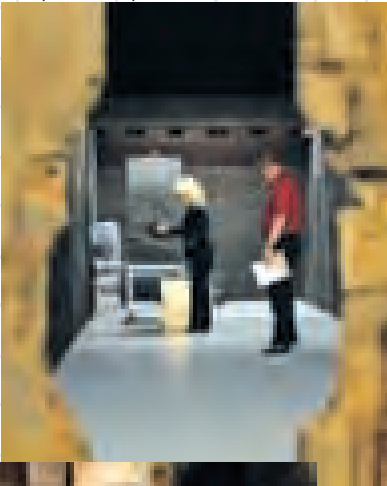


During Walk-in-Wednesdays, LAPD Detectives receive preliminary information from the Firearm Unit staff; timely information can prove very helpful in solving time-sensitive crimes. No prosecution is possible, though, until the entire analysis is completed and triple-checked.

Firing Range Room

While the Bullet Recovery Room is mostly for handguns, this Firing Range Room is also used for rifles. According to Doreen Hudson, Assistant Director of the LAPD Crime Lab, only about 8 percent of all firearms brought into the Firearm Analysis Unit are rifles; 65 percent are semi-automatic firearms; the rest are revolver-type weapons. Whereas the Bullet Recovery Room uses water to capture the bullets from a handgun, rifle bullets travel at such high rates of speed that they break up in fluid. So here, cotton is used instead of water. This long room is also used to check range and distance, for testing and analysis purposes.

In the Firing Range, Doreen Hudson explains the encapsulator trap to *Alive!* editor John Burnes.



Doreen Hudson explains how the cotton works.



ABOVE: Doreen Hudson explains the encapsulator trap, another way to capture a bullet. This device is used when the cartridge or shell is what's needed; the bullet, being expendable in these cases, goes into the encapsulator trap and is not recovered. It's used almost every day.

Bullet Recovery Room

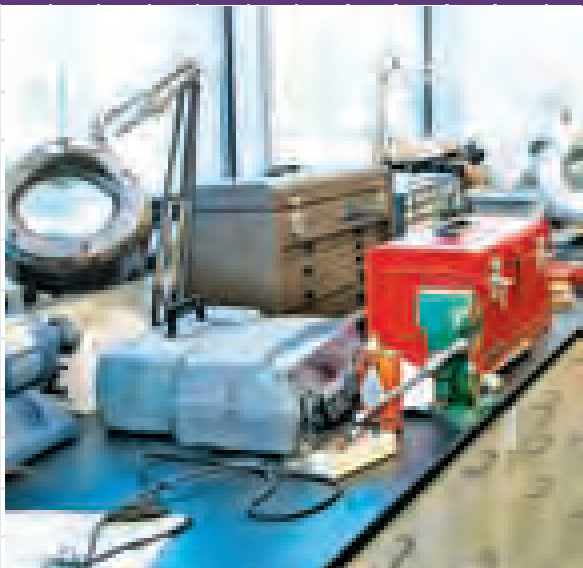
Guns are test-fired into this metallic tank to produce the telltale lands and grooves on the bullet, shell or cartridge. The bullet is captured in the water tank; the shells and cartridges are snared in the netting below the weapon.



Julie Wilkinson, Criminalist and academic trainee, 3 years of City service, demonstrates how a weapon is test-fired into the bullet recovery tank.



Julie Wilkinson fetches the spent bullet out of the water tank.



Equipment used in the Tool Room.

Tool Room

The tool room is a general purpose workshop where technicians can fix weapons that no longer function so they can test fire them, or use various tools or acids to restore a weapon serial number that for a variety of reasons is no longer visible. Once the number has been restored, it can be run through the Automated Firearms System (AFS) to determine its registration. This room is shared with the Sheriff's Dept.



Kathleen Hafeli, Criminalist, 3.5 years, an academic trainee, works on restoring a gun's serial number (actual casework).



Equipment used in the Tool Room.



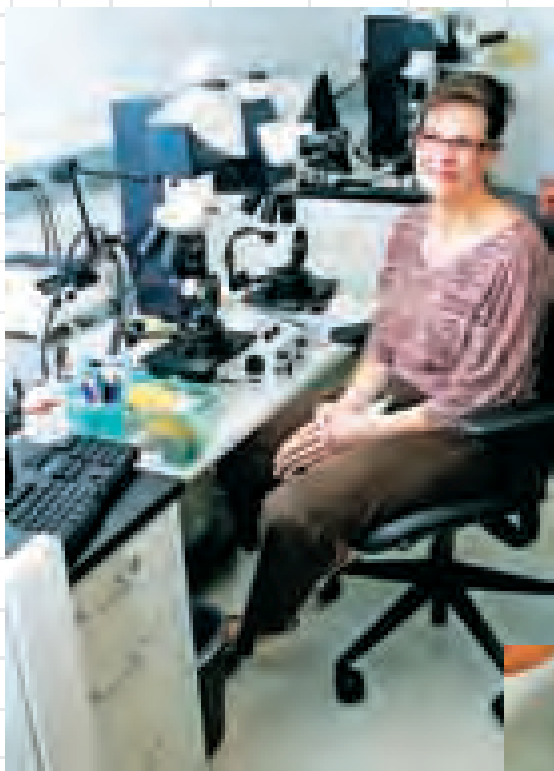
METHODS

The Business of Analyzing Firearms

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Microscope Room

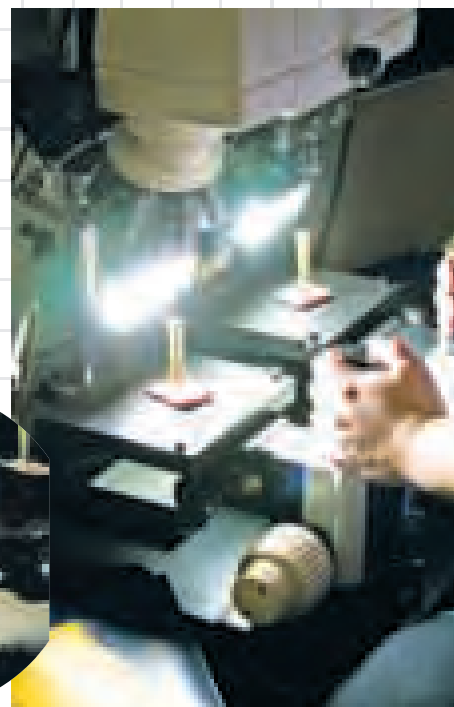
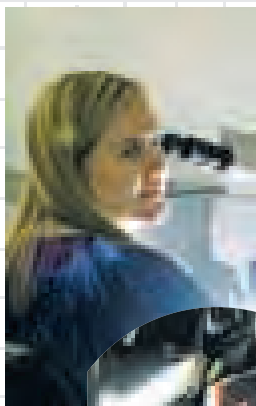
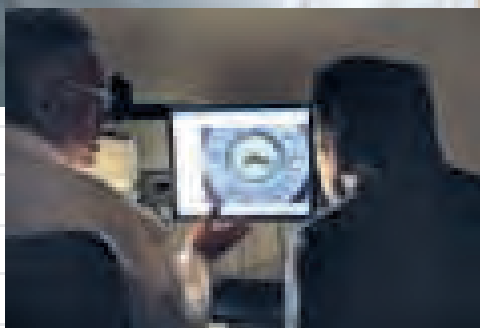
Here, some of the most painstaking, time-consuming, detail-oriented and ultimately powerful work is done. Actual case evidence is placed on under the right microscope stage, and a sample (from another case or test fired from a crime gun) is placed on the left stage. Then, using careful lighting, the analyst compares the two, looking for common toolmarks – the telltale signatures of uniquely identifiable firearms.



Allison Manfredo, Criminalist, 5 years of City service, compares a bullet on the left from a dead body, with a bullet on the right from a crime scene, to investigate whether or not they came from the same source. Her job is to say yes (identify), say no (eliminate) or say she doesn't know (inconclusive).



Daniel Rubin, Criminalist, is comparing two fired cartridge cases to determine whether or not they came from the same source. He identifies these as matching, as coming from the same weapon.



Marissa Bowen, Criminalist, 6 years of City service, is comparing two cartridge cases. She test fired them both, knowing that they came from the same source. She is studying the shells to familiarize herself with this particular type of weapon.



Ammunition Storage

Weapons to be test fired need ammunition. It is stored here.



A wide variety of ammunition is kept in these cabinets.

THE ALIVE! INTERVIEW

Doreen Hudson, Firearm Analysis Unit

On Nov. 10, Club CEO John Hawkins and Alive! editor John Burnes interviewed Doreen Hudson, Assistant Director, LAPD Criminalistics Lab, and manager over the Firearm Analysis Unit. She has 34 years of City service. The interview took place in Doreen's office in the Herzberg-Davis Forensic Science Center on the campus of Cal State Los Angeles. — Ed.

Alive!: Thanks, Doreen, for giving us that tour. How many years have you worked for the City?

Doreen Hudson: I joined the city in January 1977, so in January of next year, I guess that'll be 34 years.

Which department did you start in?

Doreen: I started in the crime lab. I've always been in the police department and always in the crime lab.

So you know this like the back of your hand.

Doreen: I know it pretty well.

Where did you start in the crime lab?

Doreen: I started as a student professional worker in the Special Testing Unit of the crime lab, working for one of the criminalists who was performing gunshot residue analysis. I worked under her for several months before being drafted into the serology unit, where they test blood and other substances.

How did you make the transition to firearms?

Doreen: When I was promoted to Criminalist from that of a lab technician, I went to the narcotics analysis unit. I spent two years analyzing solid dose narcotics. From there, I transferred into the Trace Evidence Unit, and I spent eight years performing analysis of hairs, fibers, glass, tool marks, shoe prints, et cetera. I left the Trace Analysis Unit to go into the Quality Assurance Unit, where I spent about a year before being promoted to Supervising Criminalist, and I went to the Firearm Analysis Unit as a new supervisor.

How would you describe your duties here?

Doreen: I'm the Assistant Lab Director. I'm a laboratory manager for a group of units in the crime lab, including the Firearm Analysis Unit. I supervised the Firearm Analysis Unit for about 17 or 18 years before being promoted to this position of Assistant Lab Director, where I still have managerial control over the Firearm Analysis Unit. But I don't have direct day-to-day first line supervision.

The other groups that you manage are?

Doreen: The Trace Evidence Unit, the Crime Scene Investigation Unit, and the Questioned Documents Unit.

No Normal Day

Is there a normal day for you here, or does it change rapidly?

Doreen: It fluctuates a lot.

Can you describe what a typical day might be like?

Doreen: A typical day in the firearm unit includes detectives walking evidence in so that they can be imaged into our NIBIN database, the National Integrated Ballistics Information Network. A typical day includes visitors from throughout the department who could be dropping evidence off or picking it up as part of the business that we have to do in such a timely fashion. It invariably

Finding Justice for the Citizens of L.A.

includes detectives or police officers moving evidence in and out of the crime lab. A typical day in the firearm unit involves sending at least one team of criminalists, firearm examiners, into the field to do a crime scene investigation, either at a shooting scene that's just developed or to an impound lot or some sort of police facility where evidence is being secured for a followup investigation. A typical day in the firearm unit includes the physical examination and comparison of firearm evidence. We've always got at least 20 or 30 rush cases in process at any given time. Evidence is moving from the primary examiner, who's performing the initial inventory and assessment, to that of a verification analyst, someone to come along and do the verification work that's necessary to progress the case to the next stage. A typical day involves the technical review of cases that have been completed by both the primary analyst and the verification analyst, and now is subject to technical review by yet another individual who's not involved as the primary examiner. Then the case gets administratively reviewed. There's a lot of processing going on to advance these cases. It's not as easy as just taking the case, [analyzing] it and giving your information back to the submitter. It involves lots of stages so that we're sure that the information we're reporting is technically competent, technically accurate, and technically reproducible by any other firearm examiner with similar training, background, and experience.

You said 25 to 30 rush cases. Is that all of the cases you're dealing with, or are there some that aren't rush cases? How does it break down?

Doreen: If we have 30 rush cases going at any particular time, we've got another 100 cases also assigned to examiners that aren't necessarily rush cases but part of the routine business. Plus we're processing about 25 firearms a day.

I haven't finished yet saying what a day in the Firearms Unit is like.

Oh, sorry! *[laughter]*

Doreen: It's okay. *[She smiles.]* Another part of that day is processing about 25 firearms that have been signed out of Property Division for the day for our crossfire detail to examine, categorize, test fire, and prepare for imaging into the database. Once they're done with preparing and test firing the firearms and returning the guns themselves back to the property room, then it's incumbent upon them to come back into the lab, go up to the workstations and start either reviewing correlations from test fires that they've imaged on previous days, or go to the workstations and start inputting and imaging the test fires that they've received.

There's a lot of activity in the firearm

unit going on every day, from the supervisory level, doing all that reviewing — technical review, administrative review — releasing reports to investigators, talking to district attorneys and investigators, consulting with them on their cases because they've got something coming to trial or something developing where they need some analysis performed and they are invariably in some sort of time constraint that puts additional baggage on the case.

The Era of the Database

Are you one of the biggest contributors to the NIBIN database?

Doreen: Yes, we are. Not all the guns end up in the database. Some are in poor working condition. Some are so obsolete we don't have ammunition for them. Some are revolvers and we're processing them in a different system.

Have you seen a change in firearm analysis from when you started to today?

Doreen: The biggest change in the field of forensic firearms is the advent of the database — the ability to capture digital images of the tool mark impressions left on the fired cartridge cases and bullets, and filter them through software and algorithms to help us sort through the enormous volume of firearms evidence that passes through a lab like this.

Before the databases [NIBIN and its predecessor, Drugfire] existed, we taped Polaroid photos to the wall by caliber. When you came into our old facility, you would see a wallpaper effect of all these little black and white photographs, as high as we could reach down to the floor, sorted by caliber. We'd sit at the microscope with one of our cases, and we'd photograph it and then carry that photograph over to the wall and see if we could find anything on the wall that matched the one we had in our hand. That's how hopeless our situation was. Believe it or not, we got some matches that way, and we also got matches from a few people who just remembered the cartridge case. They just remembered seeing this before. The struggle became, "which case was it?", because these guys were doing so many cases a week.

Has the choice of weapon changed since your early days?

Doreen:

Not so much.

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Doreen Hudson, Asst. Director, LAPD Criminalistics Lab, in the Tool Room.



THE *ALIVE!* INTERVIEW



Doreen Hudson, Asst. Director, LAPD Criminalistics Lab, speaks to Club CEO John Hawkins in her office.

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Have you seen a progression in the use of a particular type of firearm?

Doreen: I've seen change. I've seen a decrease in the homicide rate since I started in the early 1990s. That was really the peak of homicide season in Los Angeles. Thank heavens we've seen a volume decrease.

Of deaths or the use of guns?

Doreen: Well, there's been a decrease in crime overall, so I have to say there is a decrease in the use of guns as well. However, there's actually a reverse trend in that guns are a more popular choice. When I started with the department, people tended to get stabbed to death. I never expected as many firearm-related crimes as I encountered when I came into the Firearm Analysis Unit in the '90s. The numbers were truly staggering. We were supporting a thousand homicides a year back then. Now we're in the 300s, and so that feels like progress when you're in this line of work. It doesn't feel like it's a victory because there's still 300 murders, but it feels like progress.

In terms of the popularity of weapons, it's pretty consistent with 9 millimeter being a very popular choice for criminals. There've been some new calibers introduced, but for the most part, it seems like 9 millimeter still is one of the more popular calibers that comes through as a confiscated gun.

It doesn't mean those guns are crime guns. I'd like to point that out, too. Whenever the police have an encounter with someone and they're in possession of a firearm and the police have a lawful right to take it, they do. So this includes things like domestic violence. Those aren't necessarily crime guns, but maybe there's been a domestic dispute at someone's home and for the purposes of everyone's safety and safekeeping, the [police] take the firearms out of the home and put them in police custody for kind of a cooling-off period, and then people are entitled to get them back by going through a process. Those guns still get test fired. They still get put into the database, but they are not considered crime guns until they are linked to a crime. They're just guns that people had in their homes when they had a domestic dispute.

Did you notice a correlation between the lowering of the number of homicides, especially gun-related, and the beginning of the database era?

Doreen: No. I'd love to claim credit for that. That would be a real career achievement. But what I have seen is that the advent of the database increased the workload in the Firearm Analysis Unit tenfold. In 1991, when I came to the firearm unit, our workload was one tenth of what it is now, and yet, I've just told you that crime has decreased. We have less crime now but ten times the workload in firearms because of the database. Because detectives now have the potential to use the database to solve a crime, they're pouring that evidence in our direction. When I joined the firearm unit in 1991, detectives came to the unit only when they had something they wanted you to compare their firearms evidence to. There was no database. The type of crime was very limited for the most part in 1991, so it had to be pretty much a crime of a higher degree of seriousness, or the detectives weren't even asking us to be involved.

We're getting all types of crime now, so the database flooded us with casework. Crime went down but our workload went up a thousand percent.

The Firearm Reference Collection Room

You have a firearms library.

Doreen: Yes, the Reference Collection.

Tell us about that.

Doreen: The Reference Collection is comprised of about 2,300 firearms that the crime lab has procured over its history. This crime lab was founded in 1923. It's America's first crime lab, and the Firearm Analysis Unit has been collecting exhibits or firearms as part of its collection since its beginning. The collection that we have today is relatively large. Twenty-three hundred guns is a lot of guns. We could have more but we've been in a constrained facility in a very small building for a very long time and we really couldn't physically house any more than we had. So we put the brakes on expanding that collection for many years because we were at capacity for storage.

All the guns in that collection are guns that were issued to us as a result of a process. In the California Penal Code, there's an allowance for law enforcement agencies to retain firearms and have them registered to the law enforcement organization. The purpose of that collection is to help us with our casework. It is valuable, but it's not the kind of collection that a gun collector might have. Our collection is filled with all types of guns, but especially the kind of guns that we're going to see in criminal investigations. So we've got lots of guns that are inexpensive to purchase, cheaply manufactured, low-quality firearms, in addition to the higher-quality firearms. But a collector probably wouldn't have a Raven .25 auto in their collection if they were a dignified collector, whereas we probably have five or six of them because we come across them in police work.

And we use them to reconstruct other firearms that come in that aren't in proper working order.

Never Dull

When people find out you're involved with the firearms section of the crime lab, do you tell them some interesting stories?

Doreen: Supervising the Firearm Analysis Unit has probably been the funnest job I could've imagined ever having. We've had so many interesting cases pass through our doors. Sadly, most of them are borne out of someone's tragedy, but they've created a forensic challenge or a scientific opportunity for us to grow and learn and do something spectacular and hope at least bring closure or find justice for those who were wronged. I get a lot of satisfaction out of that; that's where I have to find my satisfaction because there's nothing joyful about the tragedies that have happened to the citizens that cause their case to end up in the firearm unit. That's been the very difficult part and a very strong counterbalance to all the enjoyment and satisfaction that comes with it.

I guess some of the most satisfaction I derive is from our Walk-In Wednesday program, by bringing the evidence into the lab and having detectives get real-time information about the possible cases that their shooting is connected to.

We started our Walk-In Wednesday program in 2003 to try to leverage this [database] technology and make it work for us. We had a tenfold increase in the number of cases coming at us. How were we going to make this work? We started getting all these hits. And

before we knew it, our backlog [grew]. We had a lot of hits to confirm. We had a stack growing three feet high of hits to confirm, and so we realized "Oh, my gosh, we can't sit on that information that is infinitely valuable to the investigators. We may not confirm it." So if 80 percent [the database's positive identification ratio back then; now it's 89 percent] of this three-foot high stack of cases to compare is going to result in identification, then detectives need that information [now] instead of years to get through that. We had a very progressive Chief, Bill Bratton, and a willingness in the department to take a bold step. We were the first in the country that I know of, in a firearm unit, to actually deliver that [tentative] information before confirming the identification. Most firearms labs would never release that kind of information until they confirmed it, until they put it through the whole process. If you wait for that, by the time that information is available to the detectives, they'll have moved on to some other case because they are moving a lot faster than [that]. They need to know, really, within 48 hours what you can tell them.

Who spearheaded that?

Doreen: I did. I'm very proud of it because it really turned our department around in being more effective in our firearm investigations.

Where did you get the idea?

Doreen: I actually kind of got it from the detectives. I talked to them, and I listened to them, and I heard what their needs were. I am married to a detective, and so I know that he dealt with complex information his whole career. I knew that he had the ability to differentiate between what was fact and what was something that needed to be corroborated. And through my relationship with him and very lengthy conversations with him and other detectives, I was able to figure out that if we told them that it still needed to be corroborated, detectives would understand how to qualify it. They would understand what to do with it and that it required further corroboration before it could be used to file charges. They got that, and they haven't abused it, so it has been a perfect situation really.

The Future of Firearm Forensics

What is the future of the lab? Other than the database, the microscopes are kind of the same.

Doreen: Yes, comparison microscopy is still the fundamental tool of a firearm examiner.

So in 10 or 20 years, what will be new?

Doreen: Three-dimensional imaging. The future in firearm identification is in three dimensional topographical mapping of the surfaces of these tool marks.

Do you see that happening with the bullet or the cartridge?

Doreen: Both.

Will this be a computer match or a human match?

Doreen: It will start with the computer.

Because that's a lot of data to go from two to three dimensions.

Doreen: It is, but it's out there already. It's just expensive. And it's hard to find funding.

What about an electron microscope? Will that be brought in?

Doreen: The scanning electron microscope? That wouldn't be the future tool of firearms.

Because you don't need to get down to that level?

Doreen: You don't. The types of individual characteristics we're looking for would not require an electron beam to resolve them. But topographical 3D mapping will scour the surface or circumference. We'll have a lot more data to refine the search and hone in on what we've got.

What are the pressures on the lab?

Doreen: One pressure is to produce reliable work in an instant, to do a lot of work and do it quickly, because timeliness is everything in a serious crime investigation. Who wants to wait even for the computer to load? We're all in a hurry, right? So we can't afford to delay this information to our detectives. On the other hand, we can't afford to be careless and to not properly document or meet the criteria of our quality system. If we sacrifice quality for quantity or timeliness, we defeat ourselves in the long run. If we lose credibility, we're out of the game. So getting that information reliable and keeping it accurate goes against the competing need to get it quick.

What about budget? Is that a challenge?

Doreen: No, not at all, we have lots of money.

She smiles as she says that.

Doreen: And laughs out loud! [she laughs]. Absolutely, this all comes at a price tag. This all comes at some cost to the City, and we're competing all the time in a civilian environment with a sworn police force. From the crime lab's perspective, we believe we have a

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resource that, when properly leveraged, can perhaps have a more significant impact on crime than our field force equivalent if we were in uniforms and patrol cars. We can leverage our technology and our information. Years ago before the database in firearms, 70 percent of the detective-initiated casework resulted in a no match, and now 89 percent of the laboratory initiated comparison work results in a positive identification. If we could use technology to drive the work that's done in the crime lab rather than investigative hunches ... if we could allow the precious and scarce resources that exist in the City to be corralled in environments like a crime laboratory where what's called kind of a forced multiplier effect could be so pronounced, we think there'd be a big advantage to gain. However, we hear on a routine basis that more uniformed officers available to respond to calls actually increases a sense of public safety. I don't argue against that. It would for me, too, as a citizen, but there's a lack of understanding as to what the lab can do.

It works to our disservice that the silly shows on television suggest that results are available at the push of a button or the click of a mouse. You watch CSI or any number of these shows that have any forensic person associated with them, they make this work look like -- you place a sample in a tray, close the instrument, push a button and wait for the results to flash by and then it tells you that it's a match. I see that all the time, that flashing match sign. Those programs influence decision makers because it looks impressive. But there's a lack of understanding for how much person power and how many resources have to be used to get a result.

[But] not all firearm labs that I visit have had the kind of flexibility and relationship with their department leaders as we have had. I think that our leaders have, for the most part, listened along the way and been flexible and willing to work with us, considering we're always under a budgetary constraint of some kind and there's always some limitations to how far we can go. Do we need more? Yes, we do. We need more, but I appreciate the support and flexibility the department leaders have given us in the years I have been associated with the firearm unit, to help us find flexible solutions and to work with us to do the best we can with what we have.

Would it help if there were a mobile firearm unit, where they go to the crime scene and they start analyzing the information there?

Doreen: We don't see the value in that because, well, Los Angeles is large – 450 square miles, but we're not so large that we can't get evidence back to the lab where our full resources are available. For example, in the tragic shooting death of [SWAT Officer] Randy Simmons that occurred a few years ago in the Valley, we worked that scene for four days straight and while we were at scene we were recovering physical evidence, but we had lots of staff on scene and we were actually transporting some of the evidence back to the lab. It wasn't a hardship for us to move things around that needed to be done back in the lab. On scene, there's a lot of emotion and a lot of undesirable influences within the crime scene. There's a lot of pressure, there's media, there are a lot of things that wouldn't really be conducive to that. It's better to always do your lab work in a more pristine, quiet, controlled environment,

where the focus is just on the work and not on the commotion around you. We've never been big proponents of the mobile crime lab.

Is that one of the biggest misperceptions about this in your opinion, that it takes more people to come to these conclusions than what they might assume by watching television or reading books?

Doreen: It takes a lot more work to reach some of these conclusions than what you might infer from reading a book.

Dedicated Staff

Tell me about your staff a little bit.

Doreen: Sure. The staff in the Firearm Analysis Unit is a remarkable collection of individuals who come together with a single purpose and a very focused goal, considering they're from very diverse backgrounds from Police Officers to Civilian Criminalists, Clerk Typists, Laboratory Technicians ... some have one year of experience, some with 30 years. Some are single, some are parents, some are grandparents. [They have] different religious backgrounds, different cultural backgrounds They have all this diverse life experience, and yet they're able to pull together for this common purpose and this shared belief that what we do really, really matters, and it really changes lives. I get very emotional about that.

They are amazing. They just bowl me over every day, and just when I think I kind of have them figured out, they surprise me again. They are a terrific group of individuals. They did a phenomenal job in so many cases where they had to set aside their own personal lives, their families, their plans and other things and pull together as a team to get the job done because they know how much it matters; they know how much it's going to affect the rest of this operation and finding justice for the citizens of Los Angeles. They inspire me.

It's clear to me, you find this job very satisfying.

Doreen: Yes, I do. I couldn't be luckier than to have stumbled into this occupation and into this organization. It's not just that I'm so lucky to be in the field of forensic science, but also to have come to work for the City of Los Angeles. I try to recruit all the time for the City of Los Angeles, because I think we are special. We're very close to our community. We all respect the City of LA. We're still trying to make a difference in the lives of the citizens of Los Angeles, and I'm really grateful to have come to an organization where there is such a close connection to the community.

I didn't know that when I was 20 years old and came to work here. I had just seen it on TV, you know? I'd seen *Dragnet*. I'd seen *Adam-12*, *Police Woman*, *Quincy*, who was actually a coroner. I was just a 20-year-old kid who wanted to make a difference and thought this was a way to do it, and it looked from what Jack Webb said that this place needed help, so I was lucky to stumble into the City. I'm glad I didn't work for a larger organization with less connection to the community. That has been a gift.

The Hawkins Legacy

Finally, what can you remember about my dad? [John Hawkins' father, Bob Hawkins, was a firearm examiner for the L.A. County Sheriff's Dept. In retirement he worked as a freelance examiner for the LAPD's Firearm Unit to help ease the backlog.]

Doreen: In 1991, I had an 800-case backlog and no one to do them. So we brought in retired contract Firearm Examiners from other crime labs to help us with our casework while we trained new examiners. Well, Bob Hawkins was one of those contract examiners that we brought in. He loved casework, and he just loved the feel of the firearms. He was excellent at that. He was loved by the judges and the juries. He was very highly regarded as a witness, so he worked very well for us.

There came a time when he decided he was willing to take on the challenge of being one of our trainers. Some of the folks that you photographed and met and talked to today are actually trainees of Bob Hawkins.

He's a very good guy. He's still well remembered and highly regarded in our Firearm Analysis Unit.

He is one of a kind.

Doreen: He is.

Thank you, Doreen.

Doreen: You're welcome. ■



Bob Hawkins, former LAPD Firearm Unit contract analyst, former career Los Angeles County Deputy Sheriff Firearm Examiner and father of Club CEO John Hawkins.

Hard at Work

Here are some other members of the Firearm Analysis Unit.

Richard Smith, Police Officer, Firearm Examiner, 30 years of City service.

BELOW: Mark Ramirez, Police Officer, 21 years of City service, is reviewing a correlation from the NIBIN database.

Dave Spelbring, Reserve Officer, Crossfire Detail, provides support staff.

ABOVE: Paul Choung, Police Officer, is training to become a full Crossfire Officer. He's inputting data into the ballistics database.

RIGHT: Srinivasan Rathinam, Firearm Examiner, is managing a research project that is looking at patterns and randomness of ballistics characteristics. He's from the Center of Forensics Sciences in Toronto.

RIGHT: The Trainers: These are two of the three trainers the Firearm Analysis Unit uses as part of the Academic Detail, from left: Nathan Cross, Criminalist, 10 years of City service; and Genaro Arredondo, Firearm Examiner, 16 years. Not pictured: Rafael Garcia.