

Automated Fingerprint
Processing--

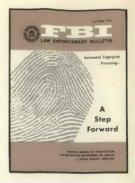
A Step Forward

FEDERAL BUREAU OF INVESTIGATION
UNITED STATES DEPARTMENT OF JUSTICE
J. EDGAR HOOVER, DIRECTOR



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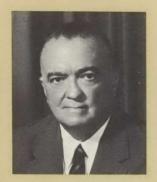
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MESSAGE FROM THE DIRECTOR . . .

. . . To All Law Enforcement Officials

It is late at night. A police cruiser occupied by two officers speeds along the residential streets in answer to an emergency call. The driver brakes the car to a quick stop in front of the address, and his partner alights and starts moving toward the front door of the dark house. Suddenly, a shot cracks the stillness, and the driver sees his partner crumple to the sidewalk, mortally wounded by the bullet. He dashes to the side of the fallen officer, drags him to the cruiser, and radios for help.

The above incident is fiction, but it is representative of much of the felonious criminal action confronting law enforcement officers in our country today. In 1969, a record high of 86 law enforcement officers were murdered, a 34 percent increase over 1968, when 64 officers were slain. For the years 1960 through 1969, 561 law enforcement officers were killed by criminals.

As in the past, firearms were used in virtually all of the police killings last year. Of the 86 officers slain, all but three died from gunfire, and handguns were used to commit 81 percent of the murders by gun. During the 1960s, 78 percent of the weapons used in police killings were handguns.

The tragic total of policemen slain last year brings out two crucial points that all officers should remember: (1) Complacency is most dangerous, and (2) there is no such thing as a "routine" arrest. Twenty-five of the 86 officers were killed while attempting to make arrests, and 13 others were slain by their own weapons which were seized and used against them.

The sharp increase in the number of officers slain comes as no surprise to members of law enforcement. The lack of respect for the law and the contempt for and abuse of persons in positions of authority have kept pace with the climbing crime rate. Thus, the role of the policeman becomes increasingly dangerous. The rate of assaults on police in 1969 rose 7 percent over the 1968 figure. And since 1962, assaults on police officers have increased 144 percent.

The law enforcement officer today bears a heavier burden, faces more frustrations, and is second-guessed more than ever before. The public asks more and expects more of the present-day policeman because the public need for protection is greater. When a policeman is assaulted or slain, the criminal significance of the incident extends far beyond the victim officer. It extends to the door of every law-abiding citizen.

The price of enforcing the law is costly. Perhaps no one knows just how costly, except the slain policeman's family and his fellow officers who stand at rigid attention by his graveside and hear the echoing volleys of the farewell salute and the fading strains of taps.

Only an aroused citizenry and swift and certain punishment by the courts can reduce felonious acts against police. When a law enforcement officer dies at the hands of a killer, part of our system of law dies with him.

JOHN EDGAR HOOVER, Director

A Step Forward

Science and technology are great assets to law enforcement. New techniques and developments are continually sought. This article by the FBI Identification Division covers research and efforts by the FBI to make automated fingerprint processing a reality in the future.

Engineering model fingerprint reader in operation. Portions of the reader from left to right are: flying spot scanner, opaque material reading head, fingerprint display scope, preprocessor, and computer with teletypewriter console.



the core, was obtained for each of the ten fingers and keypunched on cards. The punchcards were filed sequentially according to these counts. As current inquiries were received, the ridge counts were obtained for the current fingerprint card, and an appropriate group of punchcards was selected and placed in a sorting machine. This machine was equipped with selection levers for each of the ten fingers and these were set to the individual ridge counts.

System Abandoned

When the appropriate group of punchcards was run through the sorter, the punchcards whose ridge counts were within certain parameters were retained and the remainder rejected. The punchcards containing the ridge counts which most nearly matched those on the current inquiry were used to locate the master fingerprint card in file. Once located, the master fingerprint card was manually withdrawn from file and a visual comparison made with current inquiry. This "automated" system did not actually search fingerprints but eliminated some visual comparisons. As the file continued to expand, the number of fingerprint cards which had to be manually withdrawn from file and visually compared continued to increase. By the late 1940's the number of punchcards which the machine selected for visual comparison grew so great, and the attendant card-punching, referencing ,and card-handling so voluminous, that the punchcard system was abandoned. The FBI Identification Division returned to manual searching techniques which are utilized today. At the present time no automatic data processing equipment is used in connection with classifying, searching, and identifying fingerprints in the FBI Identification Division.

State identification bureaus in several of the larger States today use an

improved magnetic tape storage version of the punchcard system for handling fingerprint inquiries. These systems store the pattern type, ridge counts, whorl tracings, and biographical data, all of which are weighted and used to select a listing of fingerprint cards which have to be manually removed from file and compared by fingerprint technicians. This type of search and retrieval system will not work for the FBI Identification Division, which in the first five months of 1970 received approximately 30,000 fingerprint cards a day for processing against an arrest fingerprint file containing the fingerprints of more than 18.8 million individuals. There are, in fact, close to 200 million fingerprint cards-the most extensive collection in the world-stored in the FBI Identification Division.

Ideas Sought

The ever-growing demands for the FBI's identification services have highlighted the need for taking some constructive action to automate fingerprint identification processing. In recent years, as the potential of automatic data processing became more evident, the FBI encouraged and solicited ideas from industry. Discussions with knowledgeable industry representatives have served to highlight some of the more significant problems. At the outset, we realized the most difficult task would be to attempt to duplicate the remarkable faculties of the human eye and brain. We have long taken for granted the ability of fingerprint technicians to recognize the general shape and contour of a fingerprint (identify its pattern type), to locate focal points using a given set of parameters, and finally to select the particular distinctive minutiae to be used as the search key. We also recognize the remarkable ability of the human to make allowances for inconsistencies such as poor inking,

The FBI and the problem of automated classification and searching of fingerprints are no strangers. For more than 35 years, the FBI has searched for a means of harnessing electronic technology to the task of classifying, searching, storing, and retrieving positive fingerprint information. In 1934, the FBI Identification Division installed a punchcard system of searching fingerprints in what is known to fingerprint technicians as the all-ulnar-loop group. The ulnar loop group is that segment of a fingerprint file containing fingerprint cards with ulnar loop patterns in all ten fingers. Since ulnar loops constitute 60 percent of all fingerprints, this very fact creates major classification and searching problems. While not actually searching fingerprints, the system then installed eliminated some comparisons.

The ridge count, i.e., the number of ridges which intervene between two focal points known as the delta and scars, dirt, moisture, as well as distortions caused by pressure, physical growth, and rotation. The human does not consciously concern himself with the placement of a fingerprint impression in an exact position in the finger block on a fingerprint card. The question is: "Can a machine duplicate this remarkable ability?"

The Henry System

Discussions with industry representatives also brought to light the fact that although the Henry System of classification is satisfactory for manual searching techniques, a more sophisticated classification or descriptor would have to be devised for machine use. The Henry System of classification does not provide a unique descriptor for each fingerprint card, and, as a matter of fact, contained in the FBI Identification Division files are groups of several hundred fingerprint cards with the identical Henry classification formula. It is not believed feasible to attempt to derive a unique descriptor using the Henry System as a base. These thoughts bring to mind the tremendous task ahead, that of conversion of the massive fingerprint files housed in the FBI Identification Division. The fingerprint records now on file will have to be converted to a machine-storable medium, and at the same time essential services to law enforcement must continue unimpeded. This conversion process in all likelihood will require the operation of parallel files for an extended period.

With the foregoing thoughts in mind, in September 1965, the FBI submitted to interested members of the electronic and automatic data processing industry a request for a proposal phrased in very general terms. This proposal solicited ideas for the development of a device that would accurately read and classify inked fingerprints.

By December 1965, the FBI had received a number of responses. Most of these responses were nonspecific, general in nature, and so varied that they were not comparable. There were several proposals for systems studies for periods from 3 to 6 months costing from \$30,000 to \$50,000. Several offers were received to demonstrate the feasibility of automatic reading devices for considerably higher price quotations. One company submitted proposals containing three different approaches. It appeared the greatest consideration had been given to the use of general purpose scanners. It was apparent, however, that another group of firms was giving serious consideration to the use of a holographic technique utilizing coherent light and a series of optics to accomplish the fingerprint reading. The respondents to the request were about equally divided as to whether to retain any or all of the Henry System or to abandon it completely in favor of a new classification system. It was obvious from a review of these proposals that a more specific request would have to be submitted to industry and that FBI fingerprint experts needed competent assistance in the fields of mathematics, electrical and optical engineering, and computer sciences.

The decision was made to remain within the Federal Government, and as a result, the FBI was indeed fortunate in obtaining technical assistance from the U.S. Air Force and National Bureau of Standards. Talented, exceptionally well-qualified members of these agencies were asked to independently review the proposals which had been received in 1965. This was done, and after a great deal of deliberation and study, we decided to attack one of the more difficult aspects of the fingerprint-processing problem.

On November 30, 1966, a notice was placed in the Commerce Business Daily advising that the FBI was seeking research and development

1966, a Request for Quotation (RFQ) was submitted to industry. In essence, this request asked for the development and demonstration within a 12-month period of a device that would automatically locate and determine the relative position and orientation of specific fingerprint minutiae, that is, bifurcations and ridge endings, directly from individual inked fingerprints on standard fingerprint cards. The request required that the field of the reader in the horizontal direction provide for at least 381 units. Similarly it was required that the vertical field provide for at least 318 output units. Imagine for a moment a grid 381 units in the horizontal direction and 318 units in the vertical direction superimposed over an individual rolled fingerprint box 1.5 inches by 1.25 inches. Within this grid the reader was to determine the X and Y coordinates and direction of the specified fingerprint minutiae (bifurcations and ridge endings). The direction associated with a ridge ending is the direction of a line, centered on and bisecting the ridge and pointing toward the ridge end. The position of a ridge ending is the intersection of the direction line with a line normal to it and tangent to the end of the ridge. If one examines the negative of a photograph of a fingerprint, a bifurcation resembles a ridge ending and the direction and location of this type of minutia are defined as above for a ridge ending.

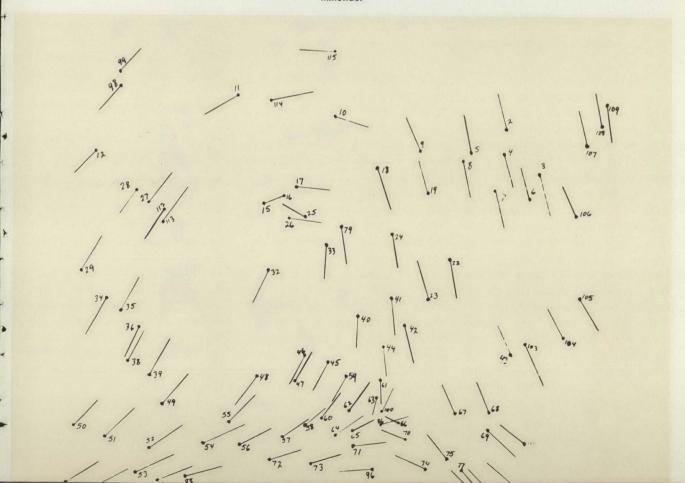
sources. Under date of December 16,

Role of Model Reader

The engineering model reader was to output the information (X and Y coordinates and direction of bifurcations and ridge endings) in a manner that could readily be entered into an electronic digital computer. It was intended that the data thus produced would be used in evaluating the reader and for experimentation with descrip-



A loop-type fingerprint pattern appears above. Below is the minutiae plot for this fingerprint showing location and direction of fingerprint minutiae.





An oscilloscope display of a fingerprint. Circles indicate minutiae detection.

tors and classification systems.

The thinking behind the requirement is neither unique nor original, as fingerprint technicians have been using minutiae and their relative position and direction for decades as a means of positive identification.

An indication of the industry's interest in this area can be garnered from the fact that a preproposal conference held at FBI Headquarters on January 12, 1967, was attended by representatives of more than 30 interested companies. The closing date for receiving proposals was February 20, 1967, and, as a result of the solicitation, 14 separate proposals were received. Each proposal was carefully technically evaluated without regard to cost. On the basis of this evaluation, two parallel contracts were nego-

tiated in June 1967. One of the contracts was to run for 10 months and the other for 13 months; however, extensions were granted on both. At the present time work is continuing to develop a working model of the finger-print reader.

Basically, the techniques used by both contractors embody opto-electronic systems for scanning inked fingerprints and detecting the position and orientation of each minutia recognized. The output is a series of binary "words" which are the language of data processing equipment. That part of the reader which observes the fingerprint is a precision flying spot scanner, in which a tiny spot of light (about one-tenth the size of the period at the end of this sentence) on a cathode ray tube is focused onto the

opaque fingerprint card and moves across the inked fingerprint in a series of small steps. Its lateral stepping motion is momentarily interrupted at each position. This technique is not unlike a searchlight tracking back and forth across the clouds. As the flying spot scanner moves across the fingerprint, it gathers data on the reflected light and dark ridge pattern in the vicinity. Since a fingerprint image consists of a number of shades or levels of gray, ranging from black to white, the electronic signals also represent various levels of intensity. Photomultiplier tubes, sensitive to the reflected light as the spot of light illuminates the fingerprint pattern in its path, produce a corresponding electrical signal which carries the pattern information to temporary storage. Special purpose digital computers containing detection logic and techniques are employed to filter the fingerprint image to reduce imperfections and improve the accuracy of the reading. Parallel electrical circuitry connected to the temporary storage registers examines the patterns of the stored data and makes the decision whether a minutia has been detected. When the detection logic locates a minutia, the orientation (angle) is measured. Once the examination is complete, the flying spot moves laterally one step to a new position, and the sequence is repeated.

How the Reader Does It

The output of the fingerprint reader may be visualized as if a dot had been placed on the fingerprint at the location of each minutia. If the fingerprint were then erased, leaving the dots, and if each dot carried a small arrow indicating the minutia direction, the output of a single fingerprint would be represented. The specific techniques employed by both companies vary and are proprietary. However, the fingerprint readers of

(Continued on page 28)

"We Can Help You,

If You'll Let Us"



By
MISS MARY CREESE*
News Editor,
Rock Springs Daily Rocket-Miner,
Rock Springs, Wyo.

Generally, the viewpoints of the press on law enforcement-press relations come from large metropolitan newspapers and are based on relations with large enforcement agencies. Since there are more small newspapers than large and more small law enforcement agencies than large, the Bulletin staff believes that their representatives should also be heard. Articles by officials of small police agencies frequently appear in our magazine. We are pleased to publish this story by Miss Creese who represents a small daily paper. We believe her observations will be of interest to all our readers.

While some law enforcement officers shy away from news reporters, and some are reluctant, with good reason, to trust the news media, we in the newspaper business can be a help to you—if you'll let us.

It took many columns of type and a lot of extra hours to persuade one sheriff that those of us who were aware of the truth knew the search for a missing teenage boy was done thoroughly and professionally, even though it was unsuccessful.

^{*}Miss Creese was a reporter, photographer, and staff writer on the Longmont, Colo., Daily Times-Call for 21 years and wire editor on the Loveland, Colo., Reporter-Herald for 2 years. For the past 9 years she has been wire and news editor on the Rock Springs, Wyo., Daily Rocket-Miner.

We knew that, because of his fatigue and disappointment, the sheriff was reluctant to report his day's efforts. I joined in the search, garnered information from many other sources, and wrote sympathetically, but truthfully, of his activities to show that everything possible was being done.

Built on Confidence

Good news stories, of course, are possible because of the confidence of law enforcement officers in the news reporter—a confidence that grows only after years of sustained accuracy, objectivity, and sound ethics.

Most law enforcement officers will agree that there is no deterrent to crime like a wide publicity campaign, that nothing helps prevent traffic accidents and slows the drivers, at least for a time, quite so much as the knowledge that "it can happen to you" or "it did happen to your neighbor."

Most officers will also agree that, if bogus currency is afloat or check artists are at work, newspaper publicity can serve notice to merchants to intensify their lookout for counterfeit bills and forged checks. As a result, the culprits may be more readily apprehended.

The professional, mature newspaper reporter and photographer wants, needs, and deserves your confidence. Between you and him can develop a mutual trust, respect, and understanding. He will guard your secrets and will appreciate your occasional need for silence.

Loss of Confidence

The police agency which withholds legitimate news from the press will soon gain a reputation of "managing the news." There will be a breach in relations, and confidence and respect will suffer. On the other hand, a reporter who violates the trust of a police official and reports on a case prematurely in order to scoop the op-

position will soon find that a valuable source of information has dried up. It is a matter of dual responsibilities in which the rights of the public rest on the integrity of both the news media and law enforcement.

I, too, have no use for the movietype reporter, who almost puts a "press" tag in his hatband, affects a trench coat, and runs everywhere, coattails flying and eyes wide, searching for a "story."

There are reporters who must be cautioned that they are not investigators—merely observers. They are employed to write about, not to probe into, criminal activity.

Air Crash Makes Headlines

While working as a reporter with the Longmont, Colo., Times-Call in November 1955, I had occasion to cover the crash of a United Airlines DC-6B which went down in flames east of Longmont killing 44 persons. The plane took off from Denver at 6:52 p.m., November 1, bound for Seattle, Wash. Eleven minutes later, when the plane had reached almost 6,000 feet, witnesses reported there were an explosion and a flash and the aircraft plunged to earth.

In a fast-breaking story of this magnitude, excellent liaison and cooperation with law enforcement officials pay off. My associates and I received tremendous assistance from willing law enforcement agencies from the very beginning. Since it was apparent from the information available at the outset that the crash resulted from a midair explosion, the big question was what caused the explosion and was it accidental or—was the aircraft sabotaged?

Six days after the crash, I learned from a reliable source outside law enforcement and official agencies concerned with the incident that a dynamite blast in the number 4 cargo pit caused the crash. Further, I was told

that baggage in this particular pit had been loaded only in Denver.

You can imagine the temptation to break this shocking information in a big story nationwide under a Longmont dateline. But, we did not. The FBI had opened a criminal investigation of the case, and we did not want to jeopardize the possibility of a quick solution and arrest. Further, I really had no right to use the information as it had been given to me in confidence.

Soon thereafter an official release was made that a bomb had caused the crash. On November 14, the FBI arrested Jack Gilbert Graham, 23, whose mother had been killed in the crash, on a charge of sabotage. A few days later, the State of Colorado charged him with the murder of his mother. Graham was tried on the murder charge, convicted, and sentenced to death. He was executed on January 11, 1957.

Sound Judgment

I believe that we at the Longmont Times-Call did what any responsible professional news staff would have done in holding off on the tip about the dynamite blast. Even though the source was reliable, and later developments corroborated the fact, we had no official confirmation. Further, we had good reason to believe that public disclosure at the time might jeopardize the possible success of the intensive investigation by the FBI and other agencies assisting. The temptation was great, but, in looking back, I am convinced our judgment was sound and in keeping with the highest traditions of the profession.

I thought at one point several years ago I had the full confidence of a local law enforcement official. However, when I inquired of him one day about a report of vandalism in a nearby school, he said there was nothing to it.

Since my source seemed reliable, I took my camera and drove out to the school. I found there that the enforcement official had indeed investigated extensive damage inside the building. When members of the school board unlocked the building (closed until damage could be repaired), I prepared a good, interesting story, which included the fact that flour, sugar, eggs, and other foods in the

mature news reporter wants to do his bit to help law enforcement officers. You can ask any responsible reporter or editor for cooperation in withholding a story pending certain developments and, if your request is valid, he will go along with you. He will, of course, expect you to advise him immediately when the story can

"The length of the acquaintance between a reporter and an enforcement official will, of course, have some bearing on cooperation. However, some police agencies are not news oriented. By nature or by habit, the officials and officers are closemouthed and offer little, if any, assistance to newsmen."

school kitchen had been thrown about with abandon. Pictures told the sad story of complete, ruthless vandalism. We did not, however, print the picture of a shoe print with an identifiable heel mark. I held that one out.

It was a livid official who confronted me the next day with my story folded out on his paper, with which he pounded my desk, demanding to know where I got the story and why I chose to write it, and stating that if he had wanted it in the paper, he would have given it to me.

I told him if he did not want the story in the paper, all he would have had to do was tell me and give me a good reason for withholding it.

Helpful Evidence

He calmed down and apologized, saying that the case was still under investigation. I asked if he had any prime suspects, to which he replied, "Two, but we can't prove anything." I offered him my picture of the heelprint, with which he later confronted one of the suspects, matched the picture with the heel of his shoe, and obtained a confession.

It is true that the professional,

be reported. Further, he will also depend on you to help protect his interest should the story become known to other news media which may not respect the agreement. However, a story with any significant news value cannot, as all officers and reporters know, be suppressed for long.

Cooperation With News Media

I have found that the degree of cooperation between the press and law enforcement differs from area to area. The length of the acquaintance between a reporter and an enforcement official will, of course, have some bearing on cooperation. However, some police agencies are not news oriented. By nature or by habit, the officials and officers are closemouthed and offer little, if any, assistance to newsmen. Some departments apparently have no plans or procedures for making available to the press information from public records, such as police blotters. Consequently, a reporter does not like to deal with departments of this type, but he welcomes the chance to work with agencies whose personnel recognize the rights of the public as represented by a free press and who furnish what information and help they can without infringing on the rights of others and without making prejudicial statements.

Reardon Report

Many representatives of news media in this area, as do others in all parts of the country, believe that the highly publicized Reardon Report* of the American Bar Association is a marked encroachment on freedom of speech and freedom of the press.

The first amendment to the Constitution of the United States, adopted December 15, 1791, 179 years ago, is a stipulation forbidding any law abridging the freedom of speech or of the press.

But today many lawyers and law enforcement agencies claim the Reardon Report—only a report, mind you—is aimed only at lawyers and law enforcement agencies to restrict the release of prejudicial statements about accused persons, and that it does not affect the release of news about crime or criminal investigations.

Most newsman see it differently. They feel it would black out arrest records and preliminary hearings. It would muzzle police officers and prosecutors and judges. It would forbid mentioning the existence of confessions, prior criminal records, and police laboratory tests.

It would allow a police officer to state that an accused individual denied charges against him, but if he admitted charges, that could not be printed. The lawyers would have a complete record of closed pretrial

^{*}Editor's Note: The Reardon Report was based on a study conducted by the Advisory Committee on Fair Trial and Free Press established by the American Bar Association in 1954 to consider the responsibilities of members of the bar, as well as responsibilities of law enforcement officials, the press, television and radio, as they relate to preservation of fair trial and avoidance of prejudicial publicity. Justice Paul C. Reardon of the Supreme Judicial Court of Massachusetts served as chairman of the committee. Views on the Report in this article are those of the writer; the FBI has made no comment on the Report.

hearings transcribed, and then after the trial or disposition of the case without trial, the lawyers would have the court reporters write up all those notes and issue copies to the press.

By then, who wants them? No newspaper which has anything to do with news would touch them. Thus the public would be deprived of another bit of public information.

Truth Will Win

Even Justice Paul Reardon, author of the bar report which bears his name, has warned that the proposals should not be used by anyone "as a cover for what should be out in the open."

As pointed out in one newspaper editorial, "The press upholds the traditional democratic ideal that truth will win in a free and open market place.

"The bar tends to believe, on the other hand," the editorial continues, "that truth is best served when filtered through the various technicalities of the court room

"If statements by law enforcement and court officials are limited to a short list of specific formalities, the public clearly will have less opportunity to learn how law enforcement is carried out in their society."

Further, some members of the bar claim that the press uses crime news to sell papers—whereas more than 80 percent of the 61 million copies of daily newspapers are pre-sold by subscription, and the press does not rely on so-called "sensational" stories to survive.

No Threat to Fair Trials

In this section of the country, to have the additional curtain, as proposed by the Reardon Report, dropped between us and news sources would constitute a definite threat to the freedom of the press.

To my knowledge, no one has come

up with any positive support for charges that the press imperils the concepts of fair trials. The people have a definite right to know what their courts and law enforcement officers are doing. No one denies the dangers of excluding the press from proceedings in any type of trial, from the slightest misdemeanor to first degree murder. If such procedures were condoned, it would follow that the greater part of every criminal trial could be conducted in secrecy behind closed doors.

judges are leaning toward the publication of names, ages, names of parents, and even street addresses of juvenile offenders.

Basically our role, with yours as officers, is protecting constitutional rights while making sure of a keener awareness of responsibility in publishing news—all the news.

That is good reason to say "no" when we are requested to withhold the name of an offender whose case goes through a court of public record. For if we comply with one request, where

"Basically our role, with yours as officers, is protecting constitutional rights while making sure of a keener awareness of responsibility in publishing news—all the news."

The public trial, in the words of a Los Angeles writer challenging the exclusion of the press, has a therapeutic function in reducing community tension, in superseding private vengeance, in removing excuses for lynch and vigilante law, in protecting the rights of the public as well as those of the defendant, and in providing values which, perhaps, society has been inclined to take for granted in recent years.

Criminal Justice

Properly conducted public trials maintain the confidence of the community in the honesty of its institutions, in the competence of its public officers, in the impartiality of its judges, and in the capacity of its criminal law to do justice.

We have cooperated to the fullest with the judges who insist we with-hold the names of juveniles involved in serious crimes—and we do cooperate, if the case goes into juvenile court. However, with the percentage of juvenile "repeaters" growing, even those

are we to stop?

A common complaint against newspapers is that we are unduly sensational in our handling of crime news—that such items may be an incentive to crime, that they pander to the cheap surface emotions of the herd mind.

Nothing could be further from the truth.

Press' Duty

The truth is that a complete, factual, and mercilessly accurate account of a crime is the duty of responsible newspapers. In the first place, crime news is not solely the concern of low-grade morons. It is also the concern of responsible law-abiding citizens.

If the youth of this country, reading the facts on a race riot or massacre or murder, are tempted to purchase machineguns and start shooting, then there is little hope for American youth and the adults who bore and reared them.

Generally, crime news, complete (Continued on page 28)

Law Enforcement

Consolidation

for Greater Efficiency

By
DALE G. CARSON
Sheriff,
Jacksonville, Fla.
and
DONALD K. BROWN
Undersheriff,
Jacksonville, Fla.

On October 1, 1968, the city and county governments of Jacksonville and Duval County combined to form the new consolidated city of Jacksonville. Our "Bold New City of the South" covers an area of 832 square miles with a population of 513,000. This vast area makes it the largest city in the Western Hemisphere. Our new police department is responsible for policing more people than live in the States of Alaska, Delaware, Nevada, Vermont, or Wyoming.

Prior to consolidation, the city of Jacksonville had a population of 190,000 and an area of 31 square miles. Its government was of the commission-council type, with the police and fire departments under the supervision of the mayor-commissioner. (This form of city government, formerly used by most American cities, lost its popularity in the 1930's. As far as we know, Jacksonville was the only large city still using it in 1968.) The police department



Mr. Carson.



Mr. Brown.

was staffed by 391 sworn officers and 83 civilians.

Pre-Consolidation

Duval County covered an area of 795 square miles exclusive of the cities of Jacksonville, Jacksonville Beach, Atlantic Beach, Neptune Beach, and the town of Baldwin, with an estimated suburban population 300,000 (1970 census 513,000 minus estimated 190,000 in Jacksonville and 23,000 in Baldwin and the beach cities). The county was governed by five county commissioners and the usual constitutional officers. Police protection was a function of the sheriff's office which included 225

sworn personnel and 36 civilians in supporting roles. The per capita cost of this protection was low mainly because of a critical personnel shortage. Although the usual low rural crime rate was rising, there seemed little hope of obtaining additional men because of the lack of an adequate tax base.

Needs Cited

In 1966, the Local Government Study Commission of Duval County released the following information on the proposed consolidation in its publication, "Blueprint for Improvement," page 100 et seq.:

"Historically the original design for police protection in Florida was a sheriff who would act as an enforcement arm of the State at the county level. Generally, he presided over a large rural territory where he served process papers of the courts and acted as court bailiff. He also provided a jail. He provided only minimal patrol or beat protection. This limited protection was not sufficient for densely populated areas; thus, municipalities provided additional police protection for which their residents were separately taxed. Because of the need for greater regulation as population becomes congested, municipalities pass law enforcement ordinances more stringent than those necessary for sparsely populated areas With the advent of rapid population growth, pressures have arisen which have outdated this 19th century design. Particularly, the automobile has transformed the traditional role of the sheriff into the counterpart of a big city police chief.

"Although the sheriff often finds himself faced with many of the same problems and responsibilities as a city police chief, he lacks three important tools with which to do the job.

"First, the county level of government has no ordinance-making power; all laws must emanate from a State legislature . . . not normally concerned with the day-to-day problems of law enforcement in urban areas.

"Second, the sheriff's enforcement tools are cumbersome. Cities have municipal courts which often meet daily and dispense justice rapidly. The Florida county has no counterpart . . .; the State courts were not designed to handle a large volume of misdemeanor violations.

"The third, and perhaps most serious, shortcoming facing the sheriff is . . . inadequate . . . financial support. The sheriff's department is primarily supported from countywide ad valorem taxes. Increased pressure on county expenditures, particularly for education, has made it very difficult for sheriff's departments to receive adequate appropriation. Once the sheriff goes beyond traditional duties, he is in effect providing 'municipal' type police protection. The cost creates a tax imbalance to the disadvantage of city dwellers, who then naturally oppose increased expenditures for the sheriff's department. Concurrently, municipal police departments have been severely restricted in carrying out their functions. Crime is not bounded by city limit lines. The amount of law enforcement needed is often determined by influences . . . beyond a city's control. . . . Not only does the economic life of the metropolitan area center in Jacksonville, but also does crime; ... with less than 40 percent of the county's population, approximately 60 percent of the county's crime occurs within the city limits. In addition, there is the tremendous burden of traffic control within the city. Suburban dwellers contribute their share of crime and traffic control problems to the 'core' city, but . . . make no direct financial contribution towards abating them. Even if the problem of financial support were solved, city police departments are still handicapped in

their functions by artificial barriers resulting from arbitrary city boundaries"

"A unified countywide department will insure the following goals:

Uniform law enforcement.

Increased crime prevention and traffic control.

... an adequate financial support base. . . .

Better utilization of manpower and facilities.

Cohesive planning to meet current and future law enforcement needs."

Former City and County Governments Abolished

The new consolidated charter abolished the former city and county governments and set up a strong mayor-type government with an elected 19-man council, a sheriff, clerk of court, tax assessor, tax collector, and supervisor of registrations. All the agencies of the former governments were combined into these offices plus several appointive boards and authorities.

The new charter placed all law enforcement responsibilities under the office of the sheriff and continued the elective status of the office.

For the first time, all law enforcement and correctional personnel and functions were to be combined into one organization. As organizational plans were developed, it became apparent that the close working relationships developed in the past would be enhanced by the creation of many opportunities for personal advancement. With 15 new top appointive positions and a reorganization of responsibilities, we have been able to advance our men to these positions and to fill numerous positions of sergeant. The charter provided that no employee would lose any right or benefit he had enjoyed prior to consolidation, which meant that all employees went to the highest level in each benefit category. The former city officers were given a raise of \$1,300 to bring them to the level of the former county men, and the county men were granted paid holidays, hospitalization, insurance, and several other fringe benefits which they did not have before.

Combining the two departments has eliminated many duplicate functions. The two communications centers were joined into one more effective unit. The consolidation of records and identification units has proven to be of great benefit to the organization; a check of one central index now gives all the information we have on a particular case or individual.

One larger investigative division is proving to be much more effective and efficient. It makes little difference now where the thieves operate; their activity is followed by one group of investigators. The vast background knowledge city and county investigators brought together has increased our crime solution rate substantially.

Back Up the Man On the Beat

The new organizational structure is patrol oriented and designed to back up the man on the beat. The rest of us are here to serve him and make his work more effective. We believe our new Department of Traffic and Patrol is rapidly developing into one of the best in the Nation. The Patrol Division of this department is divided into three rotation shifts and a special enforcement unit working during the high-crime period, generally from 7 p.m. until 3 a.m. We also have a group of evidence technicians assigned to the patrol. These men are specially trained in crime scene processing, latent print developing and photog-

Uniforms adopted under the consolidation are shown, left to right: motorcycle officer, ranking officer (lieutenant and above), and patrolman.





Marked patrol cars bear the insigne of the consolidated department on their front doors.

raphy. They work in uniform, use marked cars, and participate in aggressive patrol when not performing their specialty. Beat patrolmen of the Patrol Division investigate routine traffic accidents.

The Traffic Division handles special traffic enforcement details and problems through the use of a team of hit-and-run investigators, a special squad using three-wheel motorcycles for congested area traffic control, men specifically assigned to the control of abandoned cars and trash dumping on streets and highways, safety education specialists, and traffic analysts.

Specially Designed Helicopters Planned

In the near future, the Department of Traffic and Patrol will begin utilizing helicopters specially designed to assist in street-level law enforcement functions. Our community service unit has developed a police youth patrol which involves some 700 teenagers of the community. These young men ride with officers on patrol to gain an understanding and appreciation of the work and problems of the police officer. Under this program the officers get to know the people in the neighborhoods they patrol and develop a better relationship with them. This unit has also recently inaugurated an "Officer Friendly" program in our schools.

A Pre-Release System

Unlike many police departments, we also have the responsibility for a correctional system presently handling a thousand inmates a day in four facilities. We have work release programs, vocational guidance courses, and a detoxification center in the planning stage. With consolidation we are gradually alleviating the cor-

rectional officer shortage common to most institutions.

To bring this formerly onerous position to the level of professionalism it deserves and demands, our office has cooperated with the local junior college in instituting a degree program in correctional science and administration. The U.S. Veterans Administration has instituted an 18-month onthe-job training program in this area, an innovation which is unique in the State of Florida.

Consolidation has given us the opportunity for experimentation and innovation. We have taken a new look at police organizations and have not been bound by old methods. Some of our new techniques have been implemented and others are still being tested. Our planning and research unit is constantly examining new procedures and revealing weaknesses and strengths. We have reorganized beat structures and are now assigning men

by computer on a predicted-crime basis.

Increased Protection

Consolidation has not effected a savings to the taxpayer, but no monetary value can be placed on increased protection to life and property.

If consolidation is being discussed in your area, no doubt the proponents are pointing out the savings such a move would be for the taxpayers. This may well be true in combining the work of some duplicate governmental functions, but it is rarely true for law enforcement. The reason for this is simple. Most police agencies are already undermanned and underfinanced. When you combine two police agencies, too often you create one large undermanned and underfinanced department. The citizen will get more for his tax dollar, but he will still be taxed. Money will be saved in some areas, but it will be needed in

others. Our first combined budget of \$8 million was about \$50,000 less than the two separate budgets, but some funds had to be spent to accomplish consolidation. For example, our new communications center calls for additional equipment costing \$800,000. We spent \$175,000 for new uniforms and \$125,000 to remodel the police station. So do not let anyone sell you on the idea of saving money through

good for Jacksonville. It may or it may not work in your area; but just look around your political subdivision and add up all the money in the various police budgets. If all this money and manpower were placed in one agency, no doubt a better job could be done. There would be no dispute over jurisdictional lines, no interagency jealousy, and the men could work when and where they are most needed.

"Consolidation has given us the opportunity for experimentation and innovation. We have taken a new look at police organizations and have not been bound by old methods."

law enforcement consolidation. You can promise them a much more efficient operation, but adequate law enforcement is expensive.

We think consolidation has been

There is only so much money available in any metropolitan area for law enforcement, and we believe consolidation offers the most efficient way to use these limited funds.

UNSUSPECTING SUSPECT

A carwash in a west coast city had been the victim of a number of weekend burglaries. The amount of cash taken was small, but the cashboxes were becoming quite expensive to replace.

The local sheriff's office was requested to help devise a method to catch the burglar. Arrangements were made for a local photographer to set up a camera to photograph the burglar in the act. A decoy camera was installed and pointed toward the cashbox where it could easily be seen; another camera with infrared bulbs was well hidden.

The following weekend the carwash was burglarized again. The suspect saw the decoy camera and cautiously turned it aside. However, the concealed camera worked perfectly and caught the suspect using two fabric bags to lift the cashbox.

Hidden camera photographs the suspect lifting the cashbox.



October 1970



A University of Texas Patrolman gives directions to a visitor to the Austin campus.

The district attorney let it be known ". . . that the university campus is for learning and will not be a sanctuary for law violators."



The image of the "old campus cop" with a keychain and a flashlight is disappearing.



By
GEORGE W. H. CARLSON*
Director of Security,
The University of Texas System,
Austin, Tex.

". . . the traditional means of persuasion and voluntary compliance with laws and rules have, to a certain degree, broken down. This immediately raises the question, 'What does an institution do when such voluntary compliance does not work?"



During the 1967 session of the Texas Legislature, members of the House and Senate in a near unanimous action answered a growing need on Texas college campuses for adequate police protection by passing Senate bill 162 (art. 2919j, Vernon's Civil Statutes of the State of Texas).

While article 2919j contained several provisions relating to law enforcement, the main provision which offered assistance to State college and university campuses across Texas was the authorization of the governing boards of the schools to commission certain traffic and security personnel as peace officers.

In Texas the term "peace officer" is the highest rank in the law enforce-

^{*}Mr. Carlson served as a Texas highway patrolman from 1936 until 1938. He entered the FBI as a Special Agent in April 1938 and retired on Dec. 30, 1966. He assumed his present position in September 1967.



A University police officer reviews a collision investigation report he has just prepared.

ment field and is distinguished from game warden and other titles which come under the general heading of "law enforcement officers."

Attraction to Outsiders

In a predictable way article 2919j was both a help and a problem for many campuses. It was a help first because college campus populations were, and are, increasing rapidly; and more and more outsiders, that is, nonstudents, are being attracted to the college and university campus areas in Texas. This is true not only in schools in the University of Texas System, but at other institutions as well.

On the other side, many faculty members criticized article 2919j from its inception. Their main objection was not to the increased standards for law enforcement on college campuses, but to the point that commissioned officers would be carrying sidearms on campus. The faculty members—and they were joined by some students—told the legislature and the University of Texas administration that an academic campus is no place for a policeman with a pistol or weapon.

It should be pointed out that these complaints soon disappeared as article 2919j was implemented on campuses across the State. There was a reason for the decline in complaints. With leadership from the University of Texas System and Chancellor Harry Ransom, the position of director of security, the University of Texas System, was created; and University of Texas component institutions moved quietly and imaginatively into the area of law enforcement.

The image of the "old campus cop" with a keychain and a flashlight soon began disappearing. What had been portrayed as an elderly man shuffling around the campus rousting students from parked cars became a young, well-trained police officer patrolling the campus on foot and in squad cars offering everything from a jumper cable for dead batteries to crime investigation for the students, faculty, and staff.

The New Look

In the forefront of the new look for the University of Texas System security force was Chancellor Ransom. He took an organization plan and a recommended training program to the Board of Regents, the University of Texas System, soon after article 2919j was signed into law, and the regents approved them unanimously.

The responsibilities of the position of director of security, the University of Texas System, include the establishment of (1) qualifications for commissioned personnel, (2) organizational structure suitable for all institutions in the system, (3) continuing training programs, including basic and inservice sessions, oriented to an educational community, (4) a uniform record system, and (5) a uniform reporting procedure. Also, the director (1) serves as consultant on police matters, (2) coordinates police programs between institutions, and (3) conducts performance evaluations of the various police organizations.

Emphasis on Professionalism

Dr. Ransom was very candid in his appraisal of the situation when I came on board. He pointed out that faculty and student criticism would have to be answered, not in word, but in deed. He also called for a prompt upgrading of the security force. For this reason the University of Texas System security office adopted a motto of "Protection, Courtesy, and Service." Professionalism in law enforcement was emphasized.

Actually, what we planned to do in the system was simply an extension of what the legislature and the Governor had expressed in article 2919j. After 2 years of operation, it might be interesting to review just the introductory phrasing of Article 2919j:

"An Act providing for the protection, safety and welfare of students and employees of the respective governing boards and for the protection and policing of the buildings and grounds of the state institutions of higher education including public junior colleges of this state; authorizing the promulgation of rules and regulations and providing for their enforcement; providing for peace officers and prescribing their duties and powers; providing for the enforcement of this Act by such commissioned officers of each institution; prescribing punishments; prohibiting trespasses and damages to property. . . ."

When the legislature and the Governor handed the University of Texas System that charge, it was necessary to move quickly but efficiently and tactfully.

Day-to-Day Operations

One of the first steps was to survey each campus as to its policing needs, past practices of the traffic and security force, and the quality and ability of the security people already on the individual component's payroll.

The chiefs of the police departments on each of the component institution campuses (the University of Texas at Austin, El Paso, Arlington, Galveston Medical Branch, M. D. Anderson Hospital and Tumor Institute at Houston, Dallas Medical School, and San Antonio Medical School) report to the vice president for business affairs, or his equivalent, on their day-to-day operations. The policy for the daily operations, as well as rules and regulations pertaining to a given institu-

tion, is also formulated by each of the component institutions.

Policing of the University of Texas Medical Branch at Galveston, the University of Texas Medical School at Dallas, and the University of Texas M. D. Anderson Hospital and Tumor Institute in Houston poses different problems and requires different techniques than an academic campus such as the University of Texas at Austin or the University of Texas at El Paso. Medical schools have problems not so much with students but in regard to patients-particularly where psychiatric cases are involved. The Medical School in Dallas has nine common floors with Parkland Hospital. Our officers cooperate with Parkland's police force in maintaining security between the two buildings. Important here is the prevention of visitor traffic in the hospital wandering into the Medical School.

In outdoor security we are using patrol dogs at Galveston and El Paso in certain places where we have seen a marked increase in thefts and as-

Dr. Harry Ransom (right), Chancellor, The University of Texas System, discusses security problems with Security Director Carlson.



saults, as reflected in our annual crime reports. Where dormitory grounds are beautified with high shrubbery, plants, and trees, we use the dogs to find intruders who otherwise might go undetected or unnoticed. Because of their keen sense of smell and hearing, the dogs are a valuable asset to the patrolmen. The dogs are also considered excellent protection for the patrolmen who are assigned to these areas on the campus. Their use has been very effective. With about 63,000 students on our campuses, as well as thousands of faculty members, staff personnel, and other employees, the University of Texas System is akin to several small cities in the need for adequate peace officer protection.

On the Austin campus, for example, there is a community of almost 40,000 people who are there all hours of the day and night under varying conditions. These citizens of the campus must be afforded adequate protection.

Texas Commission on Law Enforcement Officers Standards and Education (TCLEOSE). As far as we know, this was the first recognition of this kind of program in Texas by a professional organization. In a recent letter the head of TCLEOSE said his organization "is proud to cooperate with (the university) in this program, because I believe that the University of Texas has something you need in the Nation. I don't know of any other State university system that has its own centralized security training center where it gives the concentrated training that is given in your

jective which the University System Security Office believes can be followed in the years to come.

In our basic training school we expect each student to learn the Texas motor vehicle laws in order that he may competently enforce traffic laws on University of Texas System property. The student is also expected to learn investigative procedures for traffic collisions and how to prepare accurate collision reports.

One of the major points that is heard time and time again on academic campuses is the need for the officer to be well acquainted with the

". . . once commissioned, the officer acts 'under the color of law' and therefore is subject to prosecution for failure to perform duties imposed by the State statutes as well as for going beyond his scope of authority."

Training Program Begins

After the authorization of the board on December 6, 1967, the University of Texas System immediately initiated a training program for the law enforcement officers on our campuses. While the school is conducted on the Austin campus, all policemen of the seven component institutions are required to attend 250 hours of classroom and practical application instruction before they are commissioned. Our first class, numbering 22 law enforcement officers, was commissioned on February 1, 1968. There are also an inservice school and a supervisors' seminar.

Instructors in the basic training schools and the other schools are furnished by the FBI, the Texas Department of Public Safety, the Austin Police Department, and the Texas State Attorney General's Office.

The basic training school was accredited on January 9, 1969, by the

school. As the enrollment continues to increase, and more campuses are added to your system, it will be imperative that your training program keep pace with the growth of the system."

The University of Texas System now has approximately 110 commissioned peace officers at the seven institutions. About 50 of these are on the large Austin campus. We hope to increase the number to 135 under the next budget. Additional security officers are being planned for emerging campuses in Dallas, San Antonio, and the Permian Basin.

Each of the basic training schools has been carefully planned. However, as experience always indicates, it seems that each successive school is more complete and more thorough in its coverage of police and related matters than the one before it. The basic school includes an 11-point course ob-

constitutional foundation of the laws of arrest, search, and seizure and with a procedure for their application in obtaining arrest and search warrants, making an arrest without a warrant, and making searches incidental to arrest. A detailed course covering these points is presented in our schools by Special Agents of the FBI.

FBI instructors and University of Texas System security officers spend several hours in discussions on practical problems and how the practical problems relate to actual cases. Included in these are the searches of places, the practical problems involved in obtaining and executing search warrants, and the limitations on searches both of property and vehicles.

Courtroom procedures are explained in detail by members of the University Law Office and the FBI. The student officer in the basic school



University of Texas Police use patrol dogs in securing dormitory areas and other outdoor property at the Galveston Medical Branch.

participates in a moot court trial on police cases requiring court action.

Our students are also expected to learn the provisions of the Texas State Criminal Statutes and, in particular, those statutes most applicable to a university community.

Another major item is that our students are aware of the fact that, once commissioned, the officer acts "under the color of law" and therefore is subject to prosecution for failure to perform duties imposed by the State statutes as well as for going beyond his scope of authority.

Firearms Training

Much of the course is spent on the proper use of firearms and time on the firing range. While police personnel of the University of Texas System hope that they will not need to use firearms, they feel this training is important in the basic school.

Our commissioned officers are also taught defensive tactics and how to collect, preserve, and identify evidence to be presented in a court of law.

A course in human relations is offered during classroom work. Traffic patrol tactics are taught by members of the Austin Police Department and include such topics as "observation of and detection of violators," "stopping and approaching the violator," "officer-violator relations," and "taking enforcement action."

The Austin Fire Department presents 16 hours of first aid instruction based on the Bell System First Aid and Personal Safety Course certified by the American Red Cross. Texas Department of Public Safety representatives discuss such topics as "latent fingerprints" and "criminal procedure as related to campus problems."

To date, my office has had no complaints from students or members of the faculty concerning the training program or the action of any of our peace officers.

We are also quite proud of the fact that four of our police chiefs and one assistant chief have graduated from the FBI National Academy.

Crime Reporting

The University of Texas System sought new ways of handling its police records, and we are now able to furnish annual crime statistics from campuses in the system. These figures follow the FBI standards for reporting crimes.

One of the first things our veterans and our new trainees find in today's campus world is that the traditional means of persuasion and voluntary compliance with laws and rules have, to a certain degree, broken down. This immediately raises the question, "What does an institution do when such voluntary compliance does not work?" To date, there is no specific answer, but this is the type of problem that we encounter day in and day out.

Indications are strong that the general public has little patience with what goes on at many of the Nation's educational institutions today. We in the University of Texas System are most aware of this as a result of coverage in the press and subsequent complaints to our administrators following two incidents on the University of Texas at Austin campus which attracted national attention. These have come to be known in student, faculty, administration, and general public

discussions as the "Waller Creek incident" and the "Chuck Wagon incident."

During the "Waller Creek incident" in the fall of 1969, some 22 students were removed from trees along Waller Creek and charged with disorderly conduct. The students were protesting the removal of the trees for the expansion of the University of Texas Memorial Stadium and the construction of a physical education facility. In this incident university police and Austin police cooperated in safely removing the students and nonstudents from trees and taking them to town to be charged.

The "Chuck Wagon incident" during the same period prompted the first and only use of an outside police agency in clearing a building on the University of Texas at Austin campus and this resulted in several arrests. The incident came about after the Texas Union Board, a student-majority board, said that nonstudents would be refused the use of facilities in the Chuck Wagon, a popular eating place in the Texas Student Union. A large group of students and nonstudents forced their way past monitors at the door and held a meeting in the Chuck Wagon. When they refused to leave, the university police chief determined that his officers on duty could not handle the situation and asked for assistance from the Texas Department of Public Safety and the Austin Police Department. Through long-established procedures, the Department of Public Safety and the Austin Police Department sent sufficient officers to clear the Chuck Wagon and to make those arrests that became necessary.

As a result of the confrontation in the Chuck Wagon and at Waller Creek, the Travis County Grand Jury reviewed in some detail the relationship between the University of Texas and various law enforcement officers in the geographic area of concern. Those listed were the Federal Bureau of Investigation, Department of Public Safety, Austin Police Department, Travis County Sheriff's Office, the constables of Travis County, and the University of Texas Police Department.

The report said in part, "Under the laws of the State of Texas, officers of (Continued on page 29)

A visitor obtains a permit to enter the Austin campus from a University of Texas Patrolman.



MANPOWER When You Need It

By
EARLE W. ROBITAILLE
Chief of Police,
Huntington Beach, Calif.



October 1970

Police administrators have long recognized that the hourly fluctuation in law enforcement workloads has not coincided with the normal 8-hour patrol shift, and they have tried to develop new systems of deployment to meet this problem. Several effective solutions have been offered; however, many of these proposed solutions have their own corresponding problems.

In analyzing the workload of the Huntington Beach Police Department, we found two periods of time in which there are sharp changes. During the first period, between 9 p.m. and 3 a.m., the rate of criminal occurrence is high and most of the calls require dispatching two police units. The second time period is that between 3 a.m. and

7 a.m., when we experience a sharp drop in the number of calls for service and the police task becomes one of basically inspecting police hazards.

Under the regular system of patrol deployment where each watch was on duty for 8 hours, we were experiencing large fluctuations in workload during the shifts. Typical of this problem was our "graveyard" shift. During the early portion of the shift, which started at 11 p.m., the level of calls for service was high. At approximately 3 a.m., there was a sharp drop in the number of calls for service received. During this latter period, the number of officers on duty exceeded that necessary to perform the police services required.

We have studied methods of manpower distribution which would result in the assignment of the maximum force during the late evening hours and the minimum force during the early morning hours. After considering several alternate methods, we arriod, which was instituted on February 2, 1970, we found officers having a difficult time adjusting to the new shifts. One of the primary complaints was that they could not find activities to occupy their 3-day weekends. It was not uncommon to find officers return-

between 9 p.m. and 7 a.m. during which the major shift in manpower occurred.

Response Time

In reviewing the effect of the Ten Plan on the patrol units' response time, we considered the period between 9 p.m. and 2 a.m., when Shift II and Shift III overlap, and the time between 2 a.m. and 7 a.m., when we reduce the number of personnel assigned to duty.

As could be expected, the response time between 9 p.m. and 2 a.m. was significantly reduced. Our study reflected a 32 percent reduction in response time on Code 3 (proceed to location with red light and siren) runs and a 38 percent reduction on routine calls.

The result we did not anticipate was the reduction of response time during the period of 2 a.m. to 7 a.m. The Ten Plan called for a 30 percent reduction in manpower during this time period. In spite of this substantial reduction in manpower, there was a 46 percent reduction in the response time on Code 3 runs and a 7.7 percent reduction on routine calls.

In attempting to determine what factors caused this increased efficiency, we found that prior to the application of the Ten Plan, Watch III (graveyard) was receiving a majority of its calls for service prior to 2 a.m. Because officers assigned to that shift were unable to file their reports until later in the shift, many times after 2 a.m., there was a substantial reduction of units available on the street between the hours of 2 a.m. and 7 a.m. The efficiency of the shift was further reduced by officers processing arrestees who would be taken into custody during the shift's peak period of 11 p.m. to 2 a.m. With the introduction of the Ten Plan and the resulting increase of personnel on duty between the hours of 11 p.m. and 2 a.m.,

"After reviewing our test of the effectiveness of the Ten Plan, we concluded that this method of scheduling not only increases the efficiency of our department, but also has a positive effect upon the morale of the officers."

rived at the decision to abandon the 8-hour shift in favor of a 10-hour day.

This "Ten Plan" reduced the work-week to 4 days. This system resulted in a shift overlap during the late evening hours increasing the number of beat patrol units by 45 percent. During the low call-for-service period between 2:30 a.m. and 7 a.m., the number of beat patrol cars was reduced by 30 percent. This plan resulted in the assignment of personnel in a closer ratio to the departmental workload.

We were of the opinion that the Ten Plan would not only increase the efficiency of the police department, but would also serve as an employee benefit. This plan allowed us to reduce the workweek by 21/2 hours. This was accomplished by incorporating the briefing period into the base 40 hours, which resulted in a workday increase of only 90 minutes. This scheduling had not been possible under the 8hour shift. Our initial poll of the officers indicated that they were in favor of having 3 days off each week. However, our proposal, to our knowledge, had never been tested. We were of the opinion that, in order to effectively evaluate the merits of the Ten Plan, we should institute the program for a 90-day test period.

During early stages of the test pe-

ing to the police facility on their days off.

After the initial 2 weeks, the men became accustomed to the new shift assignments and generally expressed the opinions that they would like to continue on a 10-hour day.

Objective Evaluation

At the conclusion of the 90-day test period, a questionnaire was circulated to those patrolmen affected by the plan. The men were asked whether they felt the 10-hour patrol shift had increased the department's efficiency, whether they wanted the longer shift continued, and what problems the 10-hour shift had created.

After reviewing the questionnaires returned by the officers, which overwhelmingly reflected their desire to continue with the Ten Plan, we attempted to conduct objective evaluation of the plan's effect upon the efficiency of our service.

The evaluation consisted of a study of only those hours which were directly affected by the change. There were no changes in manpower during the day shift and little change during the early portion of Watch II (swing shift). Therefore, we have only concerned ourselves with that time period

many of the calls received during this period are now serviced or handled by Watch II (swing shift). As a result, more Watch III cars are available for service during the period of 2 a.m. to 7 a.m.

Officers' Field Activity

We conducted a study of the patrol division's total field activity under the Ten Plan and found that between the hours of 9 p.m. and 2 a.m. felony arrests have increased 18.6 percent, misdemeanor arrests increased 55.28 percent, and observations increased 31.5 percent. Traffic citations have decreased 2.9 percent, but we could identify no outside cause for this reduction.

During the time period of 2 a.m. to 7 a.m., when the number of patrol units is reduced, we noted an 87.5 percent increase in felony arrests and no change in misdemeanor arrests.

Commercial Burglaries

One of our primary concerns about reducing the number of officers on duty between 2 a.m. and 7 a.m. was that we would experience an increase in commercial burglaries. Contrary to our beliefs, we found that prior to the implementation of the Ten Plan, we were experiencing 1.63 commercial burglaries each day. After instituting the 10-hour shift, we found the rate dropped to 1.3 commercial burglaries a day, a 20.2 percent reduction in that crime.

Overtime

In comparing the overtime expenditures under the Ten Plan to those under the normal 8-hour shift, we found that the overtime required for completing reports under the new plan is 47.8 percent less than previously expended.

The members of the investigative staff of the Huntington Beach Police Department, while not themselves scheduled on a 10-hour day, have encouraged the continuation of the plan. They have noted that, since the institution of the plan, the reports written and the investigations conducted by the patrolmen are far superior to those submitted prior to the test period. This improvement is attributed to the availability of time to file comprehensive reports—a direct result of the Ten Plan.

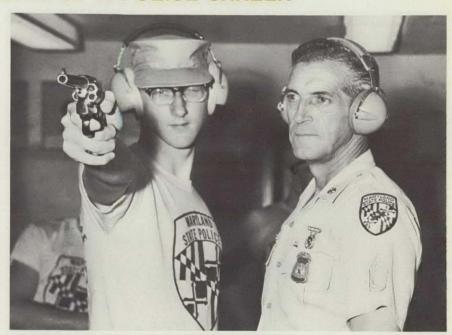
After reviewing our test of the effectiveness of the Ten Plan, we concluded that this method of scheduling not only increases the efficiency of our department, but also has a positive effect upon the morale of the officers. This higher morale, while not directly measured by our test, is reflected in the quality of work being produced. We have adopted the 10-hour shift for patrol forces on a year-round basis.

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A PREVIEW OF A POLICE CAREER

Ten outstanding senior high school students spent a week during August at the Maryland State Police Academy as "police recruits." The training program was sponsored by the Department of Maryland, The American Legion, in conjunction with the State Police.

The students, all boys, were chosen on the basis of their scholastic achievements from a group which had expressed interest in becoming law enforcement officers. Subjects studied by the students included criminal law, public speaking, motor vehicle laws, first aid, firearms, discipline, and causes of crime and delinquency. The purpose of the project, according to Maryland State Police Superintendent Thomas S. Smith, is to promote better relations between youth and law enforcement throughout the State.



A Maryland State Police instructor watches as one of the students tries his skill after a course in the use of firearms.

October 1970

NATIONWIDE CRIMESCOPE

DISGUISES USED BY FUGITIVES



Items recovered from a fugitive when he was apprehended.

A fugitive in a southern State could not escape the long arm of the law even though he had numerous disguises.

When he was apprehended, items recovered from the subject and his

automobile included nine handguns, three hair pieces, four plastic face masks, two rubber face masks, one ski mask, one hat, five pairs of gloves, one false mustache, four rolls of adhesive tape, and 52 car keys.

STOLEN MONEY ORDER USED TO PAY RENT

An investigator for a nationally known money order firm, while checking out a lead on an individual suspected of theft, learned from his landlady that he was still plying his trade.

The thief had left owing \$20 rent, but had returned "because his conscience had bothered him." Impressed by his honesty, the landlady readily agreed to cash a \$75 money order for him to pay the rent.

Needless to say, she was surprised to learn that the money order was stolen and that she had not only lost \$20 for the rent but also \$55 in cash.

WHAT MAKES PEOPLE JAYWALK?

Most safety authorities feel that pedestrian fatalities as a result of jaywalking are caused by carelessness, ignorance, and confusion. Television station WCKT decided to do a survey on the subject as a public service.

Using hidden cameras and microphones, reporters covered one of the busiest intersections of Miami Beach. During 1 hour of observation, some 50 persons were spotted jaywalking. Some of the offenders who received tickets or warnings from police officers were interviewed. Most of them explained they thought it was all right for them to cross when they did not see oncoming cars and they also thought the "go" signal was for them as well as for cars.

As a result of the jaywalking survey and talks with both pedestrians and traffic officials, the station suggested changes in traffic engineering which would lessen pedestrian exposure to vehicles. These suggestions included construction of more malls where vehicular traffic would be excluded, adding more one-way streets and overpasses, and separating the "stop" and "go" signals for pedestrians and vehicular traffic.

After filming its report, "Two Feet to the Grave," the station broadcast the show to television audiences on the eve of Memorial Day weekend. By drawing attention to the high incidence of jaywalking and exploring possible solutions, the station hoped to alert senior citizens and others in the community to the dangers of the practice.

WOMEN'S CLUBS AID STUDENTS STUDYING LAW ENFORCEMENT AND CORRECTIONS

The Pennsylvania Federation of Women's Clubs has established a fund to aid students at Pennsylvania State University studying law enforcement and corrections. Grants are made to students to help pay the extra cost of living off-campus during their required terms with law enforcement and correction agencies. The original goal of \$5,000, set 2 years ago, has more than doubled from contributions since the program began. Ninety-one students have been helped through grants of \$50 to \$200 de-

pending on academic achievement and need.

One of the professors at the university remarked, "This project illustrates that women who are concerned about a national problem can do more than talk." He further stated, "Laboratory experience out in the community is an essential part of the education of our students. And the Federation women have made it possible for scores of young men and women to get this practical training—and a headstart on their careers."

EYE TESTS FOR DRIVERS

Vision tests are now required by law in the State of Wisconsin before drivers can renew their driver's licenses. Vision screenings by the Highway Safety Bureau began in December 1969, and by the end of March 1970, 112,935 license applicants had been checked through the examining stations. Of this number, 75,606 passed the eye test unaided, 35,894 were issued restricted licenses, and 1,435 failed.

Restricted licenses are valid for driving only when the licensee is wearing corrective glasses or contact lenses. Persons failing the eye tests must have their visual deficiencies corrected in order to qualify for a license.

The screenings began with persons with odd-numbered birthdates, and beginning January 1, 1972, drivers with even-numbered birthdates will appear for examination. This will set up a rotation schedule under which all renewing drivers will undergo vision screening every 4 years.

The results of a written questionnaire given to applicants indicated that 95 percent of the drivers tested are in favor of the periodic vision test.

LEGAL ADVICE FOR POLICEMEN

The Honolulu Police Department and the Prosecuting Attorney's Office for the City and County of Honolulu have worked out a system for providing legal advice and assistance to police officers. Deputy prosecuting attorneys are assigned to the Honolulu Police Department on a rotating 2-week basis to assist officers in connection with legal problems that arise during the performance of their duties. Space has been provided at police headquarters for the attorneys so they are available for consultation.

HIT-AND-RUN SCHEME

In a southwestern State a number of hippies have devised a method of trying to collect money from motorists for alleged accidents. Failing to collect, they file a false report of damage to their car by the victim driver.

One instance involved four hippies who were driving on the freeway harassing a man and his wife. The man left the freeway and the hippie driver sped past the car. At the intersection where both cars had to stop, the hippie put his car in reverse gear and rammed into the front end of the car. The hippie demanded money for the "accident," and, when the man refused to pay, the hippie filed a police report charging the motorist had "rear-ended" his car.

Another instance involved a man who had stopped at a grocery store. After shopping, he returned to his vehicle and was confronted by a car full of hippies who wanted to know what he intended to pay for the damage he had done to their car. Not knowing what they were talking about, he refused to pay anything and left. He was later charged with hitand-run and is having to defend himself in court against the trumped up charge filed by the hippies.

YOUTH HELP POLICE

Police in southern England have initiated a program which encourages young people between the ages of 7 and 17 to help locate stolen automobiles.

Each week, on a regional television program, the license numbers of 20 stolen cars are announced.

The young detectives are asked to phone the police when they see an automobile bearing one of the license numbers on the list.

A child who is successful in spotting a stolen car gets to appear on television to receive a scroll of honor.

A STEP FORWARD

(Continued from page 6)

each company output minutiae arrays. A minutiae array is a listing of the location and direction of the bifurcation and ridge endings for the individual fingerprints scanned. This information is recorded on tape and is presently being studied.

In the final analysis, it was determined that both contractors successfully demonstrated the feasibility of reading inked fingerprints of excellent quality. Additional work must be done to effectively read fingerprints of low contrast with sufficient accuracy in order that a reading of a different impression of the same finger can be repeated at a later time. At the present time, work is continuing on enhancing fingerprints of poor quality so that the matching technique now being developed by the National Bureau of Standards will permit the recognition of minutiae arrays.

The question arises, "How does the FBI intend to apply the machine-read minutiae arrays to the problems of fingerprint classification, storage, and retrieval?" Concurrent with the development of the fingerprint reader, the National Bureau of Standards has been devising a technique to store minutiae arrays or tables in digital form and at a later time compare and recognize the array for a given fingerprint, or to state conclusively there is no array which matches the array produced by a current inquiry.

Presently under development by the National Bureau of Standards is a comparison technique or "matcher" which involves the selection of a small number of minutiae, generally five to ten, in one portion of a fingerprint, and the determination as to precisely where they are located in relation to each other. In this number a constellation pattern can be formed. As an example, from the multitude of visible stars in the night sky, there is no problem in picking out the Big Dipper in constellation Ursa Major because of the singular pattern of its components. The constellation itself can be rotated to any angle and some of its stars may be hidden by atmospheric conditions, but the Big Dipper remains recognizable. This effect is also true of fingerprints.

Although considerable progress has been made with research on minutiae arrays, at the present time a final determination has not been made on how many fingers it will be necessary to record for each individual. Similarly, no decision has been reached on the number of fingers necessary to conduct an effective search using minutiae arrays. From the outset, the ultimate concept of using only a single finger has been the goal toward which research in this area has been directed. Additional research must be conducted on the interaction of the fingerprint reader and the matching technique. FBI and National Bureau of Standards personnel assigned this arduous

and challenging task are hopeful that at a future date it may be possible to conduct a search using minutiae from only one finger. It must be recognized, however, that minutiae arrays from as many as six fingers may have to be compared when conducting searches in some of the more common groupings in the fingerprint file.

Conclusion

In conclusion, FBI fingerprint automation research thus far undertaken has proved the feasibility of extracting significant fingerprint characteristics from inked fingerprints through the use of existing scanning technology. Work is continuing in cooperation with the National Bureau of Standards on refining the matching technique. A great deal of work remains in learning how to order or classify minutiae arrays. It is anticipated that within the next 12 months a prototype fingerprint reading device will be installed in the FBI Identification Division for testing and further research. The challenge before us is to develop the speed and accuracy of the automatic fingerprint reader to the point where the performance of the amazingly adaptable and accurate human eye and brain is approached. The longrange potential in reaching this goal is virtually limitless. Once achieved, this ability will add immeasurably to the efficiency of the entire law enforcement community.

PRESS RELATIONS

(Continued from page 10)

and even blatant, is necessary before any serious move for reform is ever attempted.

Without publicity which brings out details of crimes, which the private citizen may recognize and therefrom offer his assistance, the tough solutions could be even tougher. With no news story, the person who stumbles over evidence of crime in remote places probably would never get his information to the law enforcement agencies.

We do not want to be told what to print; we will not surrender the right to public reports of events we consider newsworthy or of public interest; we will continue to publish any statement made in open court, whether or not it is stricken from the record, and we will defend our freedom to publicize wrongdoing wherever it exists, including the actions of law enforcement officers, lawyers, and judges. And we will print our own names in the news if we are the offenders.

Because the public ultimately is responsible for the administration of justice, the public is entitled to know how justice is being administered. No one has the right to keep the press and the public in darkness.

Freedom of the Press

Freedom to gather news is at the heart of any concept of a free press. When you close out sources of news, you cripple the functioning of the press. It is a combination of the rights to gather, print, and distribute which is the cornerstone of true freedom of the press.

If we have a fault, it is to underpublicize, rather than overpublicize, as staffs and space often are too small to give all areas the attention they demand and deserve.

It's Up to You

We try to attract to our business persons with an insatiable curiosity and an ability to look and listen and report — without distortion — what they see and hear. True, some reporters follow devious methods in getting there first, regardless of the end result. We have contemptible persons in our business, but you will find them wherever the pressures of competition make it necessary to perform first and explain later.

However, we can be the agency which presents your story, accurately and sympathetically, as we understand that law enforcement is one of the most hard-pressed, underpaid, and senselessly abused groups in the Nation. We can help give you the status you deserve. But what good is the professional, knowledgeable reporter, if a curtain separates him from law enforcement news? That curtain ties our hands so that we are unable to help you. It's up to you.

CAMPUS SECURITY

(Continued from page 22)

all these agencies have free ingress and egress to university grounds to carry out their responsibilities. This right of ingress for law enforcement officials never has depended upon an invitation to enter or a grant of permission to enter by the administration of the University of Texas.

"The long record of cooperation between other law enforcement agencies and the university police and the general practice of other law enforcement agencies to inform the university police, as a matter of courtesy, when outside law enforcement agencies expect to enter the university campus are commendable and are not matters of present concern."

The general policy, as a result of long and detailed discussions with the Department of Public Safety and the Austin Police Department, is that the University of Texas Police Department has the first responsibility for incidents on the campus; the Department of Public Safety and the Austin Police Department will respond when university police determine the need for assistance. A similar understanding is in effect on all University of Texas System campuses.

ROTC Disruption

For example, the University of Texas Police Department felt that it could handle a min or incident involving the attempted disruption on April 23, 1970, of an ROTC inspection on the university campus.

When the district attorney accepted the charges on the ROTC matter, he let it be known that he would not tolerate such disruption of university meetings and that the university campus was not to become a sanctuary for violators of the law.

The district attor ney's position is in total accord with that of university

officials who have said on several occasions that the university campus is for learning and will not be a sanctuary for law violators.

A plan of action has been developed by each institution's police department in cooperation with administrative officials for unusual situations such as sit-ins, demonstrations, and, at some institutions, for fires and tornadoes. Normally, a representative of the dean of students' office, seeking voluntary compliance, will first contact a group in violation of a rule, regulation, or law. If this contact is not effective, the university's police department plan is initiated. In natural disasters such as tornadoes or hurricanes, the University of Texas System is prepared to move quickly to protect lives.

Help and Understanding

University security people cooperate with all local law enforcement agencies, and the university asks for assistance only when needed.

It would be eye-opening if the public could understand the hours spent by top administrators in handling potential disruptive situations. The University of Texas System to date has been most fortunate in its handling of possible disruptions. For example, the dean of students at one of our institutions had a call from a taxpayer during a rally on the campus. The caller offered two suggestions: first, dismiss all students participating, and, second, fire all faculty members who are helping in the demonstration. At the particular time when the call came in, the dean later remembered, there were at least 4,000 to 5,000 students-as well as many faculty members-involved in listening to speeches.

While it is easy to understand the public's impatience with such activities, the quick and ready solution of "suspend the students and fire the faculty" just will not suffice. And the



Patrol dogs assist in sniffing out intruders inside campus facilities.

peaceful solution to problems at the University of Texas at Austin and at other University of Texas campuses is testimony to this point.

The only near trouble the University of Texas System has had at a Board of Regents meeting came recently when a young man wanted to have a shouting match in the room where the regents were meeting. He was quickly grabbed by a University of Texas police officer and hustled out of the room with little or no trouble. A young lady who accompanied him decided that she did not want any trouble at all and left quietly. Charges

were filed immediately on the man for disorderly conduct.

To date there have been no arrests on our Arlington or El Paso components in connection with demonstrations held on these campuses.

This today is the posture and policy of the University of Texas System Security Force—university police, cooperating with all law enforcement agencies, will handle minor occurrences. If necessary, Austin Police and/or the Department of Public Safety will be called. The channels are open for such action, but we are hopeful the need will not arise.

The Swedish Police Board Operation—

"Protect Your Car"

The Swedish Police Board recently started a nationwide campaign called "Protect Your Car." All available resources of the police were combined with a series of contributions from other authorities, branch organizations, mass media, and the car owners themselves, with the aim to protect automobiles against theft.

Car thefts constitute nearly 25 percent of the total criminality in Sweden. Every year about 100,000 thefts involving motor vehicles are reported to the police. This represents about 30,000 stolen cars, approximately 20,000 stolen scooters and motorcycles, and 50,000 thefts of objects from motor vehicles.

In 1968, insurance companies paid about \$7 million in compensation to policy holders for thefts of motor, vehicles.

In Sweden, as in many countries, juveniles are involved in a high percentage of auto thefts. In 1967, about 26 percent of car thieves were under 15 years of age. Ninety-two percent of all scooter thieves were under 15 years of age.

PREVENT CARBON MONOXIDE POISONING

Two police officers were recently killed by carbon monoxide fumes emanating from the exhaust system of their patrol car. An examination of the car disclosed holes in the trunk floor which permitted the fumes to enter the car. The holes had been made during a prior radio installation and had not been properly sealed.



Seizing the teachable "moment," Officers Phil Henry (left) and Thomas R. Williams (second from left) coach PAL members in the rules of basketball.

Columbus Police Athletic League Makes Pals of Young People

he Columbus, Ohio, Police Department recently organized a Police Athletic League (PAL) in that city to show young people that policemen do care and want to help solve their problems. Interested merchants, businessmen, manufacturers, news media, and individuals contacted by the police contributed money and time to get the program started. City officials cooperated, and Chief of Police

Dwight W. Joseph assigned three officers to work with the youth.

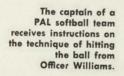
The purposes of the Police Athletic League are:

- To modify and improve the negative image of the police officer.
- 2. To reduce the high rate of delinquency and negative juvenile behavior by developing a closer

- relationship a mong youth, adults, and police.
- To help the police officer to gain a more meaningful understanding of the community he serves through closer involvement with the youth and adults.

Chief Joseph said he believes that young people can learn respect, admiration, and cooperation as well as they can learn to deride, despise, and exclude. The difference comes, he adds, with leadership that is sympathetic and knowledgeable. When the teachable "moment" arises, the leader must seize it and apply his knowledge. Each teenager has his own hangups, skills, ideas, and beliefs, the Chief explains, and each can be expected to react differently to a situation. The officers endeavor to know the youthsnot just their names, but what kind of persons they are.

Presently, the Columbus PAL involves 160 boys. Most of the league activities now center around sports. After girls are brought into the program in the future, plans include arts and crafts, dance, music, and home economics for those not sports minded. Social service, job placement, vocational guidance, and remedial reading are also being considered.





WANTED BY THE FBI



VASILE SUCEVEANU

Interstate Flight—Murder

The FBI is seeking the apprehension of Vasile Suceveanu for unlawful interstate flight to avoid prosecution for murder.

On April 6, 1968, Suceveanu and an accomplice, while allegedly attempting to rob a tavern in Union County, N.J., reputedly shot and seriously wounded two of the tavern's bartenders and killed a customer. In carrying out their escape, the two bandits reportedly forced another customer to drive them to New York City where Suceveanu's reputed accomplice was subsequently apprehended. During the flight, the two robbers engaged in gunfire with pursuing police officers.

A Federal warrant for Suceveanu's arrest was issued on April 8, 1968, at Newark, N.J.

Description

Age	29, born May 7, 1941 Romania.
Height	5 feet 10 inches.
Weight	145 pounds.
Build	Slender.
Hair	Light brown.
Eyes	Hazel.

Complexion	Fair.
Race	White.
Nationality	Romanian.
Occupations	Coal miner, electrician,
	farm worker, and porter.
FBI No	407, 684 G.
Fingerprint classi-	16 O 28 W OOI

I. 24

MII

Caution

fication _____

Suceveanu is being sought for murder by handguns committed during a holdup. He reportedly has stated that he will not be taken alive. Consider him extremely dangerous.

Notify the FBI

Any person having information which might assist in locating this fugitive is requested to notify immediately the Director of the Federal Bureau of Investigation, U.S. Department of Justice, Washington, D.C. 20535, or the Special Agent in Charge of the nearest FBI field office, the telephone number of which appears on the first page of most local directories.

ANOTHER MEANS OF LOSING

The Illinois State Police recently confiscated some novelty vending devices which had been converted into cheap prototypes of coin-operated slot machines. The lucky numbers and the amount paid for each were posted on a card attached to the glass front of the portion of the device holding the novelty items.

To operate the machine, a quarter is inserted and a handle turned to release a numbered ticket in one of three colors. Usually, the winning combination on tickets of one color pays larger amounts than the same number on tickets of the other two colors. However, as is true in gambling schemes of this type, the odds were such as to preclude a person from winning if he played the machine for any sustained period of time. The converted device is, of course, in violation of gambling laws in many areas.



A vending device that has been converted into a coin-operated slot machine.

FBI Law Enforcement Bulletin

FOR CHANGE OF ADDRESS ONLY

(Not an order form)

Complete this form and return to:

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WASHINGTON, D.C. 20535

(Name)		(Title)
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(City)	(State)	(Zip Code)

Camera Scores Again

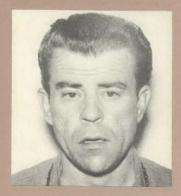
The value of bank camera photographs in identifying robbers has been proven again. Recently in a western city a defendant on trial for bank robbery, on learning that an FBI laboratory expert would testify concerning the results of a comparison of

bank camera photographs made during the robbery and known photographs of the defendant, changed his plea to guilty. He was subsequently sentenced to 12 years' imprisonment and fined \$5,000.

The ironical thing in this case is

that the robber, on entering the bank, had ripped the surveillance camera from the wall and tossed it into a planter directly below. Despite this, the camera continued to operate and took recognizable photographs of the bandit.

Three views of the robber taken from the bank surveillance film are compared with similar known photographs of the subject.









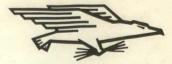




UNITED STATES DEPARTMENT OF JUSTICE FEDERAL BUREAU OF INVESTIGATION WASHINGTON, D.C. 20535

OFFICIAL BUSINESS

RETURN AFTER 5 DAYS



POSTAGE AND FEES PAID
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QUESTIONABLE PATTERN



The questionable pattern presented above possesses the minimum requirements of a whorl: two deltas with a recurve in front of each delta. Therefore, this impression is classified as a central pocket loop-type whorl with a meeting tracing.