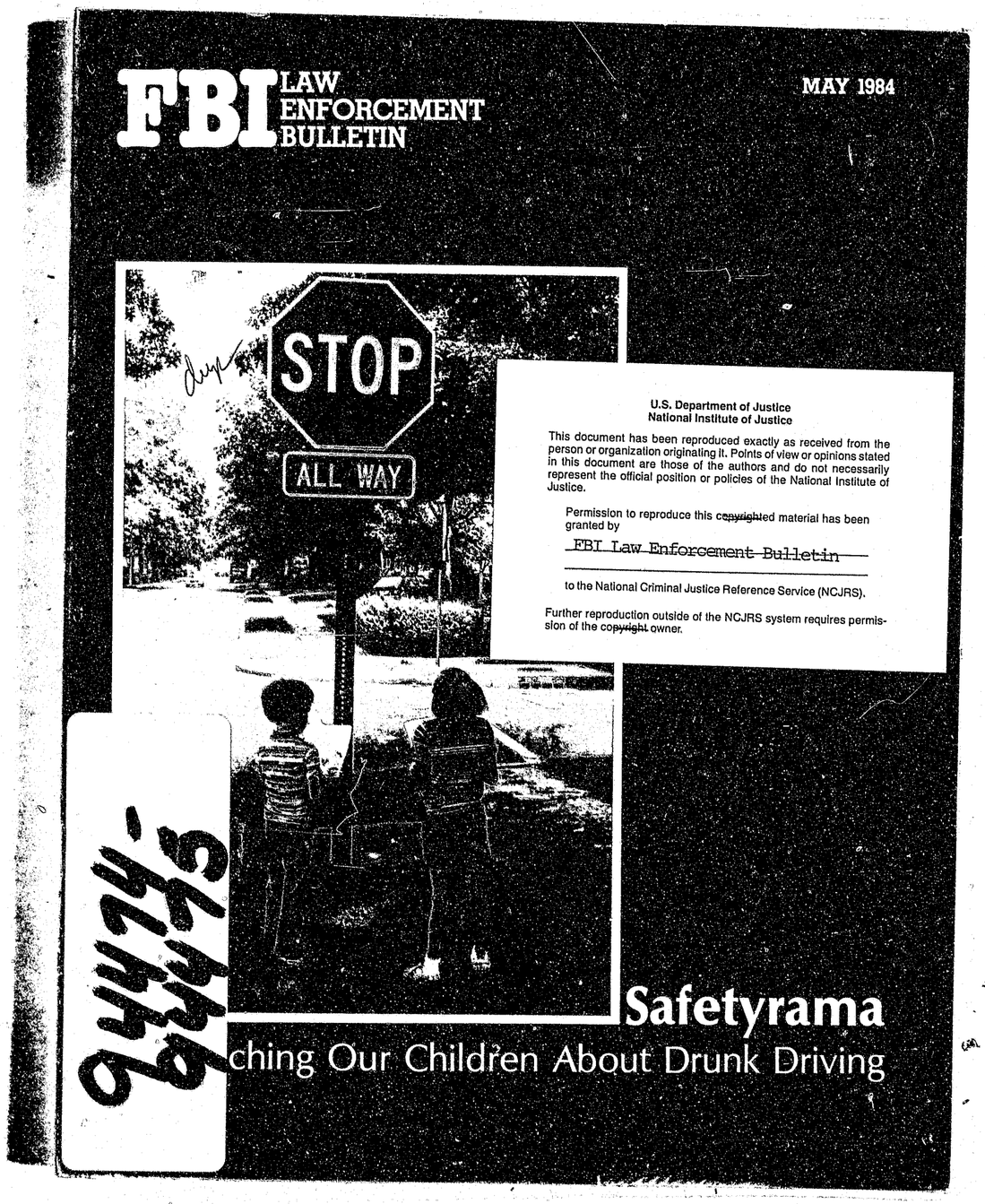

FBI LAW ENFORCEMENT BULLETIN

MAY 1984, VOLUME 53, NUMBER 5

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Federal Bureau of Investigation
United States Department of Justice
Washington, D.C. 20535

William H. Webster, Director

The Attorney General has determined that the publication of this periodical is necessary in the transaction of the public business required by law of the Department of Justice. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through June 6, 1988.

Published by the Office of Congressional and Public Affairs,
William M. Baker, *Assistant Director*

Editor—Thomas J. Deakin
Assistant Editor—Kathryn E. Sulewski
Art Director—Kevin J. Mulholland
Writer/Editor—Karen McCarron
Production Manager—Jeffrey L. Summers
Reprints—Marlethia S. Black

ISSN 0014-5688 USPS 383-310

Safetyrama

Teaching Our Children About Drunk Driving

By

ERNEST J. CIPULLO
Commissioner
and
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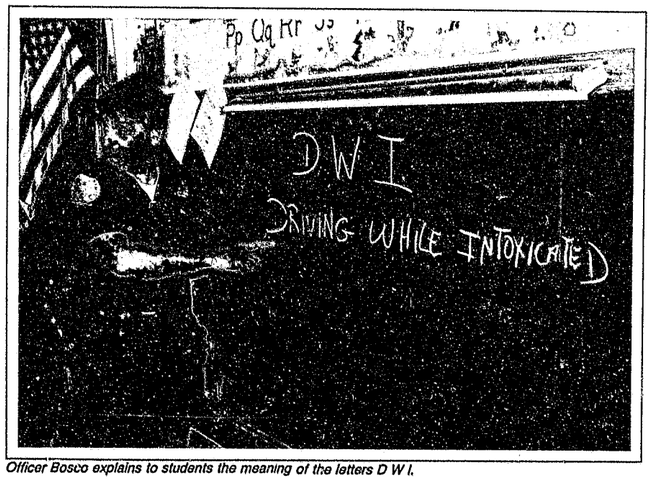
Garden City, N.Y.



Officer Bosco explains to students the meaning of the letters D W I.

"By teaching [children] about one of the problems of the real world—drunk driving—at an early age and making them aware of the seriousness of the problems, [they] can be influential in decreasing the number of traffic-related injuries and deaths that occur on our Nation's streets and highways each year."

Officer Bosco explains the principle of a radar gun to elementary school students.

the police and their safety functions. Children score points for knowing the traffic regulations they are taught and obeying them in simulated drills. Upon successful completion of the course, each child receives a safety license, or as Officer Bosco states, "an official backseat driver's license."

Unlike most traffic safety programs designed for children, Safetyrama also teaches the youngsters the meaning of driving while intoxicated and the menace drunk drivers create.[1] The students of the program may be too young to drive, but they are old enough to learn that drinking and driving don't mix. Safetyrama teaches this old message with a new approach.

To help educate young people to the realism that alcohol and driving are dangerous, the program includes a special storybook on "The Misadventures of Wags, Freckles, and Spot," three dogs who find some spilled cans of beer in an alley. Two dogs drink the beer and become drunk and disorderly. These two dogs are found "sleeping it off" by the police and are eventually hauled away to the city pound, leaving their "sober" friend behind. The story is used to stress the effects of alcohol on judgment and physical movement and is followed by a question-and-answer period to make sure the message is clearly understood. It is especially important for the child to learn to distinguish what is safe and what is dangerous and what can happen to someone who is driving while intoxicated. When asked what beer can do to you, one second grader commented, "While you're driving, it can hurt your eyesight and you could hit another person or hit a tree and kill yourself."

As with the traffic safety portion of the program, the driving while intoxicated phase also includes role playing on the DWI course. The road course is set up in the classroom, and two students are selected to act as a truck driver and a driver who is intoxicated. Both students start on different roadways and go through the course at the same time. The DWI driver fails to obey the traffic signs, turning into the path of the truck. A discussion about the results of driving while intoxicated follows, including an explanation of why it is against the law to drive in such a condition. As one student stated when asked what he learned, "Drunk driving on the road is really dangerous and it can damage your brain."

At the end of the program, each student receives a STOP DWI safety pet that he can place on his bicycle or on the dashboard of his parent's car.

The DWI program does not stop at the elementary school level. At the high school level, an intensive DWI program starts with a procedure for a vehicle stop, relative to driving while intoxicated. Students participate in a role playing simulation of a street test, being placed under arrest, handcuffed, and transported to the central testing unit.

In conjunction with the DWI role playing, there is a DWI slide film presentation, which consists of a series of slides on car crashes, broken bodies, morgue scenes, arrests, and methods of survival. The narrative is bold, hard-hitting, and readily makes the high school students stop and take notice.

Conclusion

Children can "talk" safe driving to their parents or other adults if they know traffic safety rules and regulations. By teaching them about one of the problems of the real world—drunk driving—at an early age and making them aware of the seriousness of the problem, these children can be influential in decreasing the number of traffic-related injuries and deaths that occur on our Nation's streets and highways each year. **FBI**

Footnote

U.S. Department of Justice, Federal Bureau of Investigation, *Crime in the United States—1982*, pp. 167–181. More than 1,750,000 total estimated arrests were made in 1982 for driving under the influence of alcohol or narcotic-related substances. Of those arrested, over 25,000 were under the age of 18 and 1 out of 10 were females. The number of males arrested under the age of 10 was 69; the number of females under 10 was 13.

Fighting Municipal Corruption

"This system of investigating municipal corruption has been so successful that law enforcement officials from around the world have studied the Investigative Squad's methods and tactics."

By
PATRICK W. McGINLEY
Commissioner of Investigation
New York, N.Y.

The Department of Investigation (DOI) is the law enforcement agency responsible for the detection and elimination of fraud and corruption within the New York City government. It is an independent agency, separate from the police department and the various district attorneys, with its own enforcement powers under the laws of the City and State of New York.

Specifically, the department conducts investigations into the following areas:

1) Criminal conduct by city employees committed in the course of their official duties;
2) Criminal or fraudulent conduct by private companies or citizens doing business with the city;
3) Misappropriation of city money, either in the form of fraudulent cash grants or improper contracts;
4) Negligence or mismanagement by city agencies or employees that create an atmosphere in which corruption can take place;
5) Conflicts of interest or other violations of provisions of the code of ethics by city employees or private citizens who have entered into contractual relationships with the city; and
6) Compliance with Federal, State, and city regulatory mandates by city agencies and contractor/vendors.

Origins of the Investigations

In a city of 7 million people with a municipal workforce of close to 200,000 employees and an annual budget of more than $16 billion, the forms that corruption or misconduct can take are unlimited.

Corruption-related crimes have certain elements that set them apart from other crimes. They are almost always committed in secrecy with sophistication. Corrupt officials know the strengths and weaknesses of the system and exploit them to their own advantage. Furthermore, successful corruption produces a mutuality of benefit. Participants rarely complain and are unwilling to appear as witnesses.

The department encourages the cooperation of the public, whether they be city employees or private citizens, to report acts of wrongdoing. Similarly, DOI relies heavily on the experience and imagination of its own employees. A minor case will frequently provide subtle hints of a much larger systemic problem.

DOI's cases fall into several categories: Bribery and bribe receiving, theft of city money or property, forgery of checks or official documents, impropriety in the awarding of contracts, and gross mismanagement or negligence resulting in wasted city resources.

Such classifications are an oversimplification of the inventiveness and sophistication of the criminal mind.

The department receives more than 2,100 complaints each year from a variety of sources which reflect the myriad forms that corruption takes.

- *The owner of a newly renovated home reports that a building inspector is demanding a $600 bribe before he will issue a certificate of inspection. A DOI staff member then poses as the sister of the homeowner and is filmed making the $600 payment. The inspector is arrested and his employment terminated.
- *Intelligence reports indicate that collectors are stealing parking meter revenues. After a lengthy surveillance operation, seven collectors are arrested, and the contract with the private collection firm is cancelled.
- *Examination of public assistance records indicates that certain clients are receiving an unusually large number of payments. Investigation reveals an

Forensic Science

Fiber Evidence and the Wayne Williams Trial (Conclusion)

By
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Washington, D.C.

Part I of this article dealt with the importance of forensic fiber examinations. The conclusion discusses the use of fiber evidence in the Williams case.

Development of Williams as a Murder Suspect

Before Wayne Williams became a suspect in the Nathaniel Cater murder case, the Georgia State Crime Laboratory located a number of yellowish-green nylon fibers and some violet acetate fibers on the bodies and clothing of the murder victims whose bodies had been recovered during the period of July 1979, to May 1981. The names of those victims were included on the list of missing and murdered children that was compiled by the Atlanta Task Force (a large group of investigators from law enforcement agencies in the Atlanta area). The yellowish-green nylon fibers were generally similar to each other in appearance and properties and were considered to have originated from a single source. This was also true of the violet acetate fibers. Although there were many other similarities that would link these murders together, the fiber linkage was notable since the possibility existed that a source of these fibers might be located in the future.

Initially, the major concern with these yellowish-green nylon fibers was determining what type of object could have been their source. This information could provide avenues of investigative activity. The fibers were very coarse and had a lobed cross-sectional appearance, tending to indicate that they originated from a carpet or a rug. The lobed cross-sectional shape of these fibers, however, was unique, and initially, the manufacturer of these fibers could not be determined. Photomicrographs of the fibers were prepared for display to contacts within the textile industry. On one occasion, these photomicrographs were distributed among several chemists attending a meeting at the research facilities of a large fiber producer. The chemists concurred that the yellowish-green nylon fiber was very unusual in cross-sectional shape and was consistent with being a carpet fiber, but again, the manufacturer of this fiber could not be determined. Contacts with other textile producers and textile chemists likewise did not result in an identification of the manufacturer.

In February 1981, an Atlanta newspaper article publicized that several different fiber types had been found on two murder victims. Following the publication of this article, bodies recovered from rivers in the Atlanta metropolitan area were either nude or clothed only in undershorts. It appeared possible that the victims were being disposed of in this undressed state and in rivers in order to eliminate fibers from being found on their bodies.[11]

On May 22, 1981, a four-man surveillance team of personnel from the Atlanta Police Department and the Atlanta Office of the FBI were situated

Special Agent Deadman

under and at both ends of the James Jackson Parkway Bridge over the Chattahooche River in northwest Atlanta. Around 2:00 a.m., a loud splash alerted the surveillance team to the presence of an automobile being driven slowly off the bridge. The driver was stopped and identified as Wayne Bertram Williams.

Two days after Williams' presence on the bridge, the nude body of Nathaniel Cater was pulled from the Chattahoochee River, approximately 1 mile downstream from the James Jackson Parkway Bridge. A yellowish-green nylon carpet-type fiber, similar to the nylon fibers discussed above, was recovered from the head hair of Nathaniel Cater. When details of Williams' reason for being on the bridge at 2:00 a.m. could not be confirmed, search warrants for Williams' home and automobile were obtained and were served on the afternoon of June 3, 1981. During the late evening hours of the same day, the initial associations of fibers from Cater and other murder victims were made with a green carpet in the home of Williams. Associations with a bedspread from Williams' bed and with the Williams' family dog were also made at that time.

An apparent source of the yellowish-green nylon fibers had been found. It now became important to completely characterize these fibers in order to verify the associations and determine the strength of the associations resulting from the fiber matches. Because of the unusual cross-sectional appearance of the nylon fiber and the difficulty in determining the manufacturer, it was believed that this was a relatively rare fiber type, and therefore, would not be present in large amounts (or in a large number of carpets).

The Williams Carpet

Shortly after Williams was developed as a suspect, it was determined the yellowish-green nylon fibers were manufactured by the Wellman Corporation. The next step was to ascertain, if possible, how much carpet like Williams' bedroom carpet had been sold in the Atlanta area—carpet composed of the Wellman fiber and dyed with the same dye formulation as the Williams' carpet. Names of Wellman Corporation customers who had purchased this fiber type, technical information about the fiber, and data concerning when and how much of this fiber type had been manufactured were obtained.

It was confirmed that the Wellman Corporation had, in fact, manufactured the fiber in Williams' carpet and that no other fiber manufacturer was known to have made a fiber with a similar cross section. It was also determined that fibers having this cross-sectional shape were manufactured and sold during the years 1967 through 1974. Prior to 1967, this company manufactured only a round cross section; after 1974, the unusual trilobal cross section seen in Williams' carpet was modified to a more regular trilobal cross-sectional shape. A list of sales of that fiber type during the period 1967 through 1974 was compiled.

The Wellman Corporation described the fibers used in the construction of Williams' carpet as being composed of a nylon 6,6 polymer called Wellman 181B. The Wellman 181B fiber was sold to 12 companies from 1967 to 1974 in undyed sections, each 6 inches in length. The purchasers, for the most part, were carpet yarn spinners (companies that prepare yarn from loose fibers). After a carpet yarn is prepared, it is then used to manufacture the face (pile) of the actual carpet. In order to determine the manufacturer of Williams' carpet, it was necessary to contact all purchasers of Wellman carpet fiber like that used in his carpet. These companies, normally those who prepare carpet yarn only, were asked to furnish the names of carpet manufacturers who had purchased carpet yarn made of Wellman 181B fibers.

At the outset, a problem arose. A number of companies either having purchased Wellman 181B fibers or having manufactured carpet from yarn composed of Wellman 181B fibers were no longer in business. Therefore, it was necessary to locate former employees of the defunct companies to see if they could recognize the fibers in Williams' carpet or recognize an actual piece of the carpet from Williams' room. In each of these contacts, a sample of the carpet from Williams' home was made available for display by investigators.

Through numerous contacts with yarn spinners and carpet manufacturers, it was determined that the West Point Pepperell Corporation of Dalton, Ga., had manufactured a line of carpet called "Luxaire," which was constructed in the same manner as the Williams' carpet. One of the colors offered in the "Luxaire" line was called "English Olive," and this color was the same as that of the Williams' carpet (both visually and by the use of discriminating chemical and instrumental tests).

It was learned that the West Point Pepperell Corporation had manufactured the "Luxaire" line for a 5-year period from December 1970 through 1975; however, it had only purchased Wellman 181B fiber for this line during 1970 and 1971. In December 1971, the West Point Pepperell Corporation changed the fiber composition of the "Luxaire" line to a different nylon fiber, one that was dissimilar to the Wellman 181B fiber in appearance. Accordingly, "Luxaire" carpet, like the Williams' carpet, was only manufactured for a 1-year period. This change of carpet fiber after only 1 year in production was yet another factor that made the Williams' carpet unusual.

It is interesting to speculate on the course the investigation would have taken if the James Jackson Parkway Bridge had not been covered by the surveillance team. The identification of the manufacturer of the nylon fibers showing up on the bodies could still have occurred and the same list of purchasers of the Wellman fiber could have been obtained. The same contacts with the yarn and carpet manufacturers could have been made; however, there would not have been an actual carpet sample to display. It is believed that eventually the carpet manufacturer could have been determined. With a sample of carpet supplied by West Point Pepperell—which they had retained in their files for over 10 years—it would have been possible to conduct a house-by-house search of the Atlanta area in an attempt to find a similar carpet. Whether this very difficult task would have been attempted, of course, will never be known. A search of that type, however, would have accurately answered an important question that was discussed at the trial—the question of how many other homes in the Atlanta area had a carpet like the Williams' carpet. An estimation, to be discussed later, based on sales records provided by the West Point Pepperell Corporation indicated that there was a very low chance (1/7792) of finding a carpet like Williams' carpet by randomly selecting occupied residences in the Atlanta area.

Only the West Point Pepperell Corporation was found to have manufactured a carpet exactly like the Williams' carpet. Even though several manufacturers had gone out of business and could not be located, it was believed that considering the many variables that exist in the manufacture of carpet and the probable uniqueness of each carpet manufacturer's dye formulations, it would be extremely unlikely for two unrelated companies to construct a carpet or dye the carpet fibers in exactly the same way. A large number of other green fibers, visually similar in color to Williams' carpet, were examined. None was found to be consistent with fibers from the Williams carpet.

Probability Determinations

To convey the unusual nature of the Williams residential carpet, an attempt was made to develop a numerical probability—something never before done in connection with textile materials used as evidence in a criminal trial.[12] The following information was gathered from the West Point Pepperell Corporation:

1) West Point Pepperell reported purchases of Wellman 181B fiber for the "Luxaire" line during a 1-year period. The Wellman 181B fiber was used to manufacture "Luxaire" carpet from December 1970, until December 1971, at which time a new fiber type replaced that Wellman fiber.
2) In 1971, West Point Pepperell sold 5,710 square yards of English Olive "Luxaire" and "Dreamer" carpet to Region C (10 southeastern States which include Georgia). "Dreamer" was a line of carpet similar to "Luxaire" but contained a less dense pile. In order to account for the carpet manufactured during 1971, but sold after that time, all of the "Luxaire" English Olive carpet sold during 1972 to Region C (10,687 square yards) was added to the 1971 sales. Therefore, it was estimated that a total of 16,397 square yards of carpet containing the Wellman 181B fiber and dyed English Olive in color was sold by the West Point Pepperell Corporation to retailers in 10 southeastern States during 1971 and 1972. (In 1979, existing residential carpeted floor space in the United States was estimated at 6.7 billion square yards.)[13]
3) By assuming that this carpet was installed in one room, averaging 12 feet by 15 feet in size, per house, and also assuming that the total sales of carpet were divided equally among the 10 southeastern States, then approximately 82 rooms with this carpet could be found in the State of Georgia.
4) Information from the Atlanta Regional Commission showed that there were 638,995 occupied housing units in the Atlanta metropolitan area in November 1981.[14] Using this figure, the chance of randomly selecting an occupied housing unit in metropolitan Atlanta and finding a house with a room having carpet like Williams' carpet was determined to be 1 chance in 7,792—a very low chance.

To the degree that the assumptions used in calculating the above probability number are reasonable, we can be confident in arriving at a valid probability number. The assumptions made included:

1) The sales records provided by the West Point Pepperell Corporation were complete and accurate;
2) The carpet sold by West Point Pepperell containing Wellman 181B fiber dyed English Olive in color was distributed and installed equally throughout the 10 southeastern States;
3) All the carpet sold to retailers in Georgia was installed in the Atlanta metropolitan area.
4) Each residential unit contained only 20 square yards of the carpet in question;
5) All English Olive carpet sold in 1972 contained the Wellman 181B fiber, even though the use of that fiber type was discontinued in December 1971.
6) None of the English Olive carpet installed during 1971 and 1972 had been discarded; and
7) No other carpet manufacturer would produce a carpet containing Wellman 181B fiber dyed with essentially the same English Olive dye formulation.

With the exception of #2 and #7, the assumptions are conservative. In other words, the real probability number is likely to be smaller than 1 in 7,792. For example, if it were assumed that 60 square yards of the carpet had been installed in each house, then the probability number would become 1 in 23,406. (Williams' residence had over 60 square yards of the carpet).

If assumption #2 were changed so that one-half of the 16,397 square yards sold to the 10 southeastern States was sold (and subsequently installed) in metropolitan Atlanta, the probability of finding a residence containing 20 square yards of carpet like Williams' carpet would become 1 in 1,559.

The probability figures illustrate clearly that the Williams' carpet is, in fact, very uncommon. To enhance the figures even further, it is important to emphasize that these figures are based on the assumption that none of the carpet of concern had been discarded during the past 11 years. In fact, carpet of this type, often used in

commercial settings, such as apartment houses, would probably have had a normal lifespan of only 4 to 5 years.[15]

The validity of assumption #7 is arguable. However, considering the comparatively small amount of Wellman 181B fiber used to produce carpet, the nature of the coloring process used by the carpet industry, and the actual comparisons of many green carpet fibers, it is believed that no companies using Wellman 181B fiber would duplicate the dye formulation used by West Point Pepperell. (Four individual dyes were mixed to color the Wellman fiber in Williams' carpet.)

The Williams Trial

To any experienced forensic fiber examiner, the fiber evidence linking Williams to the murder victims was overwhelming. But regardless of the apparent validity of the fiber findings, it was during the trial that its true weight would be determined. Unless it could be conveyed meaningfully to a jury, its effect would be lost. Because of this, considerable time was spent determining what should be done to convey the full significance of the fiber evidence. Juries are not usually composed of individuals with a scientific background, and therefore, it was necessary to "educate" the jury in what procedures were followed and the significance of the fiber results. In the Williams case, over 40 charts with over 350 photographs were prepared to illustrate exactly what the crime laboratory examiners had observed. Several types of charts were prepared, including:

1) Educational charts to illustrate different classifications of textile fibers and to show the variety that can exist within one fiber classification. Charts listing the microscopes used, as well as the fiber properties and characteristics that are compared during microscopical comparisons.
2) A series of charts showing objects in Williams' environment which were linked to the various victims. These were used to facilitate reference to and discussion of particular objects.
3) Charts where photomicrographs of foreign fibers removed from a particular victim were shown next to photomicrographs of similar fibers from known objects in Williams' environment.

Each of the fiber photomicrographs was enlarged to an 8-by 10-inch color print to give a final magnification of approximately 600X. These 8- by 10-inch prints were cropped to a final size of 5-by 7-inches. As many as 16 prints could then be displayed on a standard size 30-by 40-inch chart.

Considerable time and expense were involved in the preparation of the charts used in the Williams trial. This was because of the tremendous amount of evidence linking Williams to the many victims. In a more typical case, where the fiber evidence is not so voluminous, charts and photographs could more easily be prepared.

Representatives of the textile fiber industry, including technical representatives from the Wellman and West Point Pepperell Corporations, were involved in educating the jury regarding textile fibers in general and helped lay the foundation for the conclusions of the forensic fiber examiners. The jury also was told about fiber analysis in the crime laboratory.

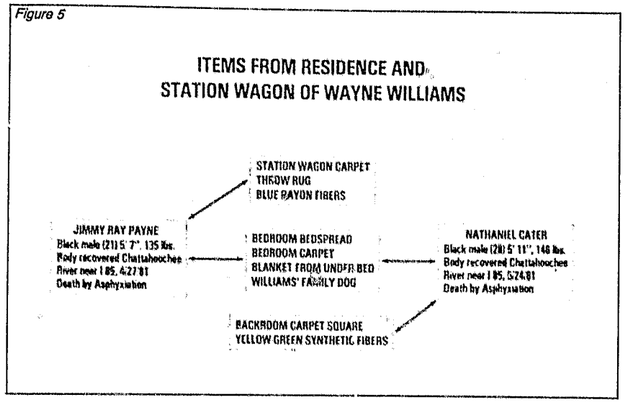
The trial, as it developed, can be divided into two parts. Initially, testimony was given concerning the murders of Nathanial Cater and Jimmy Ray Payne, the two victims included in the indictment drawn against Williams in July 1981. Testimony was then given concerning Williams' association with 10 other murder victims.

The fiber matches made between fibers in Williams' environment and fibers from victims Payne and Cater were discussed. The items from Williams' environment that were linked to either or both of the victims are shown in the center of the chart. (See fig. 5.) Not only is Payne linked to the Williams' environment by seven items and Cater linked by six items, but both of the victims are linked strongly to each other based on the fiber matches and circumstances surrounding their deaths.

In discussing the significance or strength of an association based on textile fibers, it was emphasized that the more uncommon the fibers, the stronger the association. None of the fiber types from the items in Williams' environment shown in the center of figure 5 is by definition a "common" fiber type. Several of the fiber types would be termed "uncommon."

One of the fibers linking the body of Jimmy Ray Payne to the carpet in the 1970 station wagon driven by Williams was a small rayon fiber fragment recovered from Payne's shorts.

Figure 5



Data were obtained from the station wagon's manufacturer concerning which automobile models produced prior to 1973 contained carpet made of this fiber type. These data were coupled with additional information from Georgia concerning the number of these models registered in the Atlanta metropolitan area during 1981. This allowed a calculation to be made relating to the probability of randomly selecting an automobile having carpet like that in the 1970 Chevrolet station wagon from the 2,373,512 cars registered in the Atlanta metropolitan area. This probability is 1 chance in 3,828, a very low probability representing a significant association.

Another factor to consider when assessing the significance of fiber evidence is the increased strength of the association when multiple fiber matches become the basis of the association. This is true if different fiber types from more than one object are found and each fiber type either links two people together or links an individual with a particular environment. As the number of different objects increases, the strength of an association increases dramatically. That is, the chance of randomly finding several particular fiber types in a certain location is much smaller than the chance of finding one particular fiber type.

The following example can be used to illustrate the significance of multiple fiber matches linking two items together. If one were to throw a single die one time, the chance or probability of throwing a particular number would be one chance in six. The probability of throwing a second die and getting that same number also would be one chance in six. However, the probability of getting 2 of the same numbers on 2 dice thrown simultaneously is only 1 in every 36 double throws—a much smaller chance than with either of the single throws. This number is a result of the product rule of probability theory. That is, the probability of the joint occurrence of a number of mutually independent events equals the product of the individual probabilities of each of the events (in this example—$\frac{1}{6} \times \frac{1}{6} = \frac{1}{36}$). Since numerous fiber types are in existence, the chance of finding one particular fiber type, other than a common type, in a specific randomly selected location is small. The chance then of finding several fiber types together in a specific location is the product of several small probabilities, resulting in an extremely small chance.

Probability theory has previously been used to some extent in determining the significance of evidence, but has often been used incorrectly. In most cases, an adequate foundation had not been laid for the individual probability estimates—a foundation that would include the validity of reasonableness of the figures used and a demonstration that individual probabilities are independent of one another. In the Williams case, it was believed that the probability numbers obtained were based on valid data and were, in fact, conservative estimates. However, no attempt was made to use the product rule and multiply the individual probability numbers together to get an approximation of the probability of finding carpets like Williams' residential carpet and Williams' automobile carpet in the same household. The probability numbers were used only to show that the individual fiber types involved in these associations were very uncommon.[16]

It should be noted that carpet is one of the few types of fibrous material that is suitable for statistical analysis. This is because manmade carpet fibers are usually dyed and have much larger diameters than textile fibers from most other sources. Most carpet fibers have cross-sectional shapes which are only used in carpet fibers and which often are unique to a particular fiber manufacturer. Therefore, a large diameter fiber, especially those that are colored, can usually be identified as having originated from a carpet. Additionally, because carpet is generally a high-cost item, accurate and complete sales records are more likely to exist.

If so, an accurate estimation of the total amount of carpet produced or sold by a manufacturer in a particular area could be determined. This may not be an easy task, but is possible, as shown in the Williams case. It is assumed that each of the carpet manufacturers is using dye formulations unique to its company, for reasons explained earlier.

Refer again to figure 5. In addition to the two probability numbers already discussed (bedroom and station wagon carpets), each of the other fiber types linking Williams to both Cater and Payne has a probability of being found in a particular location. The chance of finding all of the fiber types indicated on the chart in one location (seven types on Payne's body and six types on Cater's body) would be extremely small. Although an actual probability number for those findings could not be determined, it is believed that the multiple fiber associations shown on this chart are proof that Williams is linked to the bodies of these two victims, even though each fiber match by itself does not show a positive association with Williams' environment.

Studies have been conducted in England that show that transferred fibers are usually lost rapidly as people go about their daily routine.[17] Therefore, the foreign fibers present on a person are most often from recent surroundings. The fibrous debris found on a murder victim reflects the body's more recent surroundings, especially important if the body was moved after the killing. Accordingly, the victims' bodies in this particular case are not only associated with Williams, but are apparently associated with Williams shortly before or after their deaths.

Figure 6

VICTIM'S NAME	DATE VICTIM MISSING	DAYS MISSING	BODY RECOVERY AREA	CAUSE OF DEATH	AGE	WEIGHT	HEIGHT
EVANS	7/25/79	3	WOODED AREA S.W. ATLANTA	PROBABLE ASPHYXIATION/ STRANGULATION	13	87 LBS.	5'4"
MIDDLEBROOKS	5/18/80	1	NEAR STREET S.E. ATLANTA	BLUNT TRAUMA TO HEAD	14	88 LBS.	4'10
STEPHENS	10/9/80	1	NEAR STREET S.E. ATLANTA	ASPHYXIATION	10	120 LBS.	5'0"
GETER	1/3/81	33	WOODED AREA FULTON COUNTY	MANUAL STRANGULATION	14	130 LBS.	5'4"
PUE	1/22/81	1	NEAR HIGHWAY ROCKDALE CO.	LIGATURE STRANGULATION	15	105 LBS.	5'5"
BALTAZAR	2/6/81	7	NEAR HIGHWAY DEKALB CO.	LIGATURE STRANGULATION	12	125 LBS.	5'4"
BELL	3/2/81	31	SOUTH RIVER DEKALB CO.	ASPHYXIATION	16	100 LBS.	5'2"
ROGERS	3/30/81	10	NEAR STREET N.W. ATLANTA	ASPHYXIATION/ STRANGULATION	20	110 LBS.	5'3"
PORTER	4/10/81	1	NEAR STREET IN S.W. ATLANTA	STABBED	28	123 LBS.	5'7"
PAYNE	4/22/81	5	CHATTAHOOCHEE RIVER FULTON COUNTY	ASPHYXIATION	21	135 LBS.	5'7"
BARRETT	5/11/81	1	NEAR STREET DEKALB CO.	LIGATURE STRANGULATION (3 PUNCTURE WOUNDS)	17	125 LBS.	5'4"
CATER	5/21/81	3	CHATTAHOOCHEE RIVER FULTON COUNTY	ASPHYXIATION/ STRANGULATION	28	146 LBS.	5'11"

It was also pointed out during the trial that the locations of the fibers—on Payne's shorts and in Cater's head hairs and pubic hairs—were not those where one would expect to find fibrous debris transferred from an automobile or a house to victims who had been fully clothed.

Although from these findings it would appear that the victims were in the residence of Williams, there was one other location that contained many of the same fibers as those in the composition of various objects in his residence—Williams' station wagon. The environment of a family automobile might be expected to reflect, to some extent, fibers from objects located within the residence. This was true of the 1970 station wagon. With one exception, all of the fiber types removed from Payne and Cater, consistent with originating from items shown in the center of figure 5, were present in debris removed by vacuuming the station wagon. The automobile would be the most logical source of the foreign fibers found on both Payne and Cater if they were associated with Williams shortly before or after their deaths. It should also be pointed out that two objects, the bedspread and the blanket, were portable and could have at one time been present inside the station wagon.

Both Payne and Cater were recovered from the Chattahoochee River. Their bodies had been in the water for several days. Some of the fibers found on these victims were like fibers in the compositions of the bedroom carpet and bedspread except for color intensity. They appeared to have been bleached. By subjecting various known fibers to small amounts of Chattahoochee River water for different periods of time, it was found that bleaching did occur. This was especially true with the carpet and bedspread fibers from Williams' bedroom.

Two crime laboratory examiners testified during the closing stages of the first part of the trial about Williams' association with Payne and Cater. They concluded that it was highly unlikely that any environment other than that present in Wayne Williams' house and car could have resulted in the combination of fibers and hairs found on the victims and that it would be virtually impossible to have matched so many fibers found on Cater and Payne to items in Williams' house and car unless the victims were in contact with or in some way associated with the environment of Wayne Williams.

After testimony was presented concerning the Payne and Cater cases, the Fulton County District Attorney's Office asked the court to be allowed to introduce evidence in the cases of 10 other victims whose murders were similar in many respects. Georgia law allows evidence of another crime to be introduced " . . . if some logical connection can be shown between the two from which it can be said that proof of the one tends to establish the other as relevant to some fact other than general bad character." [18] There need be no conviction for the other crime in order for details about that crime to be admissible.

It was ruled that evidence concerning other murders could be introduced in an attempt to prove a "pattern or scheme" of killing that included the two murders with which Williams was charged. The additional evidence in these cases was to be used to help the jury ". . . decide whether Williams had committed the two murders with which he is charged." [19]

There were similarities between these additional victims and Payne and Cater. (See fig. 6.) Although some differences can also be seen on this chart, the prosecution considered these differences to fit within the "pattern of killing" of which Payne and Cater were a part. The most important similarities between these additional victims were the fiber matches that linked 9 of the 10 victims to Williams' environment. The fiber findings discussed during the trial and used to associate Williams to the 12 victims were illustrated during the trial. (See fig. 7.)

The 12 victims were listed in chronological order based on the dates their bodies were recovered. The time period covered by this chart, approximately 22 months, is from July

Figure 7

NAME OF VICTIM	VIOLET AND GREEN BEDSPREAD WILLIAMS' BEDROOM	GREEN CARPET WILLIAMS' BEDROOM	DOG HAIRS WILLIAMS' DOG	YELLOW BLANKET WILLIAMS' BEDROOM	BLUE RAYON FIBERS DEBRIS FROM WILLIAMS' HOME	TRUNK LINER 1973 PLYMOUTH	CARPET 1973 FORD	CARPET 1970 CHEVROLET	ADDITIONAL ITEMS FROM WILLIAMS' HOME, AUTOMOBILES OR PERSON
Alfred Evans	X	X			X				
Eric Middlebrooks	X	X				X			YELLOW NYLON FORD TRUNK LINER
Charles Stephens	X	X		X					YELLOW NYLON WHITE POLYESTER BACKROOM CARPET FORD TRUNK LINER
Lubie Geter	X	X					X		KITCHEN CARPET
Terry Pue	X	X							WHITE POLYESTER BACKROOM CARPET
Patrick Baltazar	X	X	X				X		YELLOW NYLON WHITE POLYESTER HEAD HAIR GLOVE JACKET PIGMENTED POLYPROPYLENE
Joseph Bell	X			X					
Larry Rogers	X	X	X				X		YELLOW NYLON PORCH BEDSPREAD
John Porter	X	X	X	X			X		PORCH BEDSPREAD
Jimmy Payne	X	X	X	X			X		BLUE THROW RUG
William Barrett	X	X	X	X			X		GLOVE
Nathaniel Cater	X	X	X						BACKROOM CARPET YELLOW-GREEN SYNTHETIC

1979, until May 1981. During that time period, the Williams family had access to a large number of automobiles, including a number of rental cars. Three of these automobiles are listed at the top of figure 7. If one or more of the cars was in the possession of the Williams family at the time a victim was found to be missing, the space under that car(s) and after the particular victim's name is shaded.

Four objects (including the dog) from Williams' residence are listed horizontally across the top of figure 7, along with objects from three of his automobiles. An "X" on the chart indicates an apparent transfer of textile fibers from the listed object to a victim. Other objects from Williams' environment which were linked to various victims by an apparent fiber transfer are listed on the right side of the chart. Fiber types from objects (never actually located) that were matched to fiber types from one or more victims are also listed either at the top or on the right side of the chart. Fourteen specific objects and five fiber types (probably from five other objects) listed on this chart are linked to one or more of the victims. More than 28 different fiber types, along with the dog hairs, were used to link up to 19 objects from Williams' environment to 1 or more of the victims. Of the more than 28 fiber types from Williams' environment, 14 of these originated from a rug or carpet.

The combination of more than 28 different fiber types would not be considered so significant if they were primarily common fiber types. In fact, there is only 1 light green cotton fiber of the 28 that might be considered common. This cotton fiber was blended with acetate fibers in Williams' bedspread. Light green cotton fibers removed from many victims were not considered or compared unless they were physically intermingled with violet acetate fibers which were consistent with originating from the bedspread. It should be noted that a combination of cotton and acetate fibers blended together in a single textile material, as in the bedspread, is in itself uncommon.

The only other natural fiber of the 28 types discussed was a rust-colored woolen fiber removed from the body of Patrick Baltazar. This fiber was consistent with woolen fibers in the composition of a leather jacket recovered from Williams' home. Additionally, a rayon fiber of the type also present in this leather jacket was removed from Baltazar's body.

Some of the objects contained more than a single fiber type. Many of the different fiber types within each of these objects were recovered from at least one victim.

Williams was strongly linked to all the victims except Joseph Bell. Bell was a "river victim," whose body was recovered from the South River in Atlanta 31 days after he was reported missing. The body was recovered wearing only a pair of undershorts, and as would be expected, very few fibers were located.

The bodies of the nine victims were recovered near streets and highways in the Atlanta metropolitan area. It appeared that in all of these cases, the bodies had been moved from the murder scene to the recovery sites. A considerable amount of fibrous debris was recovered from these nine victims. As would be expected, the number of individual fibers within a fiber type linking any one of these victims to Williams' environment was much larger than in the cases of Payne and Cater.

The previous discussion concerning the significance of multiple fiber matches can be applied to the associations made in the cases of all the victims except Bell, but especially to the association of Patrick Baltazar to Williams' environment. Fibers and animal hairs consistent with having originated from 10 sources were removed from Baltazar's body. These 10 sources include the uncommon bedroom carpet and station wagon carpet. In addition to the fiber (and animal hair) linkage, two head hairs of Negroid origin were removed from Baltazar's body that were consistent with originating from the scalp area of Williams. Head hair matches were also very significant in linking Williams to Baltazar's body. In the opinion of author, the association based upon the hair and fiber analyses is a positive association.

Another important aspect of the fiber linkage between Williams and these victims is the correspondence between the fiber findings and the time periods during which Williams had access to the three automobiles listed on the chart. Nine victims are linked to automobiles used by the Williams family. When Williams did not have access to a particular car, no fibers were recovered that were consistent with having originated from that automobile. Trunk liner fibers of the type used in the trunks of many late model Ford Motor Company automobiles were also recovered from the bodies of two victims.

One final point should be made concerning Williams' bedroom and station wagon carpets where probability numbers had been determined. Fibers consistent with having originated from both of these "unusual" carpets were recovered from Payne's body. Of the nine victims who were killed during the time period when Williams had access to the 1970 station wagon, fibers consistent with having originated from both the station wagon carpet and the bedroom carpet were recovered from six of these victims.

The apparent bleaching of several fibers removed from the bodies of Payne and Cater was consistent with having been caused by river water. Several fibers similar to those from Payne and Cater were removed from many of the victims whose bodies were recovered on land. Consistent with the bleaching argument, none of the fibers from the victims found on land showed any apparent bleaching. The finding of many of the same fiber types on the remaining victims, who were recovered from many different locations, refutes the possibility that Payne's and Cater's bodies picked up foreign fibers from the river.

The fact that many of the victims were involved with so many of the same fiber types, all of which linked the victims to Williams' environment, is the basis for arguing conclusively against these fibers originating from a source other than Williams' environment.

It is hoped that this article has provided valuable insight concerning the use of fiber evidence in a criminal trial, has provided answers to questions from those in the law enforcement community about textile fiber evidence in general, and has presented convincing arguments to establish Wayne Williams' association with the bodies of the murder victims. **FBI**

Footnotes

[11] Prior to the publication of the February 11, 1981, newspaper article, one victim from the task force list, who was fully clothed, had been recovered from a river in the Atlanta area. In the 2½-month period after publication, the nude or nearly nude bodies of seven of the nine victims added to the task force list were recovered from rivers in the Atlanta area.

[12] E. J. Mitchell and Holland, "An Unusual Case of Identification of Transferred Fibers," *Journal of the Forensic Science Society*, vol. 19, 1979, p. 23. This article describes a case in which carpet fibers transferred to a murder victim's body in England were traced back to the carpet manufacturer and finally to an automobile owned by the person who eventually confessed to the murder.

[13] This information was taken from a study by E.I. du Pont de Nemours & Co. concerned with the existing residential floor space with carpet in the United States. This study was reported in the marketing survey conducted by the Marketing Corporation of America, Westport, Conn.

[14] Information regarding the number of housing units in the Atlanta metropolitan area was obtained from a report provided by the Atlanta Regional Commission. The report, dated November 11, 1981, contained population and housing counts for counties, super districts, and census tracts in the Atlanta metropolitan area.

[15] Information about carpet similar to Williams' carpet was developed through contacts with carpet manufacturers and carpet salesmen in Georgia. It was determined that this type carpet was often installed in commercial settings, such as apartments, and in those settings, had an average life span of 4 to 5 years.

[16] Joseph L. Peterson, ed. *Forensic Science* (New York: AMS Press, Inc., 1975), pp. 181–225. This collection of articles, dealing with various aspects of forensic science, contains five papers concerned with using statistics to interpret the meaning of physical evidence. It is a good discussion of probability theory and reviews cases where probability theory has been used in trial situations.

[17] C. A. Pounds and K. W. Smalldon, "The Transfer of Fibers between Clothing Materials During Simulated Contacts and their Persistence During Wear," *Journal of the Forensic Science Society*, vol. 15, 1975, pp. 29–37.

[18] *Encyclopedia of Georgia Law*, vol. 11A (The Harrison Company, 1979), p. 70.

[19] *The Atlanta Constitution*, "Williams Jury Told of Other Slayings," Sec. 1–A, 1/26/82, p. 25.

1982, p. 25.

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