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PROOF OF GUILT IN CAPITAL CASES—AN UNSCIENCE

WILLARD J. LASSERS

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To what extent do the police and prosecution, in cases where death is the sentence for murder, avail themselves at the trial of the techniques of modern science in establishing guilt? So far as we are aware, no prior investigation of this matter has been conducted.

The question is important, its ramifications extending far beyond the small number of individuals sentenced to death in any one year (60 to 80) and the still smaller number executed (7 in 1965 and 1 in 1966). If it appears that the police and prosecution do not make full use of current technology in death cases, then it seems a fair assumption that still less use is made of such methods in murder cases where the death penalty is not sought and in other non-capital criminal prosecutions. Presumably the prosecution makes the most thorough investigation and has the most positive proof of guilt in those cases where the extreme penalty is sought. If the resources of science are employed at all, one would expect them to be utilized the most where the heaviest penalty is sought.

There is another related reason for investigating the use of science in murder prosecutions. In 1964, in the *Escobedo* decision, and again in 1966 in the *Miranda* decision, the Supreme Court of the United States placed radical restrictions on the prosecution in obtaining admissible confessions from persons in custody. Few issues in law enforcement are more emotion-laden. Civil libertarians (and we include ourselves) believe that conviction by confession, among its other evils, kills inducement to good police work. Others view confessions as essential to law enforcement, claiming that in many instances there is no other way to solve crimes. We do not presume to resolve this dispute. Surely, however, data on the utilization of scientific techniques is

relevant to the controversy. A showing of failure to make full use of modern methods tends to support the view that reliance on confessions has retarded growth of scientific methods of crime fighting.

There is a third reason for interest in the topic: it throws some light upon a related, but different question, that is, the extent to which the police and prosecution avail themselves of scientific techniques in ascertaining the identity of the criminal, apart from the use of such evidence in the courts. The state of the art as used to convict may reflect the state of the art as used to catch the accused. We are concerned here, however, solely with scientific evidence in court.

Let us stress an important point. Our attention is directed solely at the use of scientific evidence to determine the identity of the individual responsible physically for the death of the victim. We were not concerned with scientific testimony as to the numerous "state of mind" issues that arise in a murder trial, such as mental capacity, ability to form an intent to kill, the "voluntary" character of a confession, etc. These issues are beyond the scope of this paper.

We think our study shows an incredible lag in the employment of modern methods. The prosecution does use scientific evidence in upwards of 25% of all cases, but it relies almost exclusively on three forms of such evidence, the newest of which is 40 years old: firearms identification (so-called "ballistics"), blood typing, and fingerprint comparison. We deem this fact highly disturbing, not because of the percentage (since there is no standard for judging whether it is high or low), but because it indicates stagnation. And it indicates something more and worse: that the scientific process stands at the periphery of the judicial fact finding inquiry, not integrated as it ought to be in every step of the investigative and prosecution process.

Regarding the defense, the record is dismal. It hardly ever uses scientific evidence, and then its efforts generally are limited to helpful admissions

* The committee members were: Martin Baron, Mary Thale, Richard Whitney, Robert Spitzer, James B. Osgood, Beverly Williams, Paula Gorney, and Chris May. The committee expresses its indebtedness for the assistance of Carol Blomgren, Winifred Meeks, Audrey Dulaney, Richard Fried, Judith Siegel, and Diane Reichenberger.

on cross-examination from prosecution experts. We shall comment below on the reason for this situation.

These conclusions are based on a review of substantially all Illinois capital cases decided by the Supreme Court of Illinois since 1950, and all capital cases in the United States for 1963, 1964, and 1965 which have been reviewed by state or federal appellate tribunals. Sentences imposed in 1966 have not yet been reviewed by higher tribunals.

We chose, for several reasons, to study capital cases—cases tailor-made to appraise the use of technology by the prosecution:

1. As previously stated, scientific evidence is more apt to be used in capital cases than in other cases;
2. The limited number of such cases per year permits examination of every case. Hence we need not rely on a sample.
3. Because of the penalty, almost every capital case is appealed, usually to the highest court of the state. Hence, there are prepared a verbatim record of the testimony, or a full summary; briefs by the prosecution and defense; and a written opinion by the court. The latter is nearly always published; it usually contains a detailed recital of the facts, and is readily available in law libraries.

We became interested in our topic during the course of another study. During 1964–1965, for other purposes, the Illinois Division of the American Civil Liberties Union conducted a survey of all cases in Illinois since 1950 where the defendant was sentenced to death. Upon reading the court opinions, it seemed to us that there was heavy reliance in these cases on confessions, witness testimony, and other traditional modes of proof. Science seemed to play a subordinate role. Our interest piqued, we decided to restudy the cases, adding the cases decided subsequently. Our procedure was as follows: we read all of the court opinions (in some cases there were both state and federal court opinions or more than one state court opinion), and, in addition, we examined the “abstract of record” which contains substantially all of the trial testimony in narrative form.

During the period 1950–1966, there were 42 capital cases that came before the Supreme Court of Illinois. The decision on the initial appeal to that court, and the subsequent disposition, are shown in Table I. Three cases of the 42 had to be excluded because there was no published opinion by the Supreme Court of Illinois or by any other court.

TABLE I
CAPITAL CASES IN ILLINOIS 1950–1966

Judgment affirmed by Illinois Supreme Court		
Executed	11*	
Sentence commuted	2	
Died of natural causes	1	
Suicide	1	
Further legal proceedings or commutation pending	7	
Discharged by federal courts	1	
Total	23	23
Judgment reversed and new trial granted		
No capital sentences subsequently imposed	17	
Not yet retried	2	
Total	19	19
		42**

* Includes two cases where Illinois Supreme Court refused review. See text.

** Excluded are 10 cases where the trial court has imposed the death sentence but the case has not been reviewed. Among the 10 is one woman.

One defendant died while his case was pending on review, and two individuals were executed without any appellate review of their decisions because Illinois law at the time granted review in the Illinois Supreme Court to those convicted of non-capital felonies, but made review in capital cases discretionary. In these two cases, review was denied by the court. Further, in these two cases, no abstract was available.

Now to the meat of the matter: Of the 39 cases, some form of scientific evidence was introduced in 15 cases (38%). In these such cases, firearms identification (ballistics) testimony was introduced on 11 occasions. In two cases there was testimony from an expert that because of the condition of a bullet, no such examination was possible. Blood type evidence was introduced on two occasions, and fingerprint evidence on two occasions. (We have considered one palm print as fingerprint evidence.) No other form of scientific evidence was introduced in any case by the prosecution.¹

¹ In one robbery-murder case, the defendant was convicted of robbery. A sawed-off shotgun “similar to” the murder weapon was found in the possession of an accomplice, together with a length of gun barrel and portion of a stock. Scientific evidence was intro-

There was but a single case where scientific evidence was introduced by the defense. Seven years after the initial state court trial, the defendant was granted a federal court hearing. In these proceedings, for the first time, the defendant had an opportunity to have a defense expert examine a pair of shorts which the prosecution contended were stained with the blood of the victim. The victim, aged 8, had been sexually attacked and murdered. At the hearing, this expert testified that the stains were paint and not blood as the prosecution had claimed in the original trial. Further, in this proceeding it was shown that the prosecution had not revealed to the defendant, at the original trial, a crime lab report that a hair found in the vagina of the child was not defendant's. The conviction was set aside by the Supreme Court of the United States because of the suppression of evidence regarding the paint.

We were taken aback by our findings. Illinois is a leading urban, industrial state and yet the foundation of all methods of scientific evidence employed by the prosecution in these cases was established 40-60 years ago. Fingerprinting dates from the development of a workable system of classifying the prints in the 1890's and firearms identification in the middle 1920's. Blood groups were discovered in the 1900's.

These methods are not only old, but all three suffer defects. Firearms identification, of course, is of value only where the weapon is a gun and both bullets (or shells) and the alleged murder weapon are found by the prosecution. But firearms identification does not enlighten us on the crucial question, namely, "Who fired the gun?". True, in the context of a specific trial, it may be a link in a chain leading to the defendant.

Fingerprints where found can be almost conclusive, but in some situations they are valueless. Thus, if the defendant is accused of murdering his wife with his own gun, his fingerprints in the house are meaningless. His fingerprints on his own gun are scarcely more important.

Blood grouping evidence, as presented, suffers its own defect. In the usual case, the prosecution's evidence is that the victim had blood of a specific type (A, AB, B or O), that blood of that same type was found, say, on the defendant's garments, and that defendant has blood of another type.

The weakness of this evidence is that among

white Europeans about 45% have Type A, 10% Type B, 5% Type AB and 40% Type O. In the usual case, victim and defendant have either Type A or O. Hence, if the defendant has any blood on his garment, there is nearly a 50% chance that it is of the same type as the victim.

After analyzing the Illinois data, we asked ourselves next whether the Illinois cases represented an isolated phenomenon. Perhaps if we reviewed the national picture for recent years the results would be different. We regret to say that the pattern is essentially the same. An initial problem was to determine the cases for study.

There is essentially no coordination between the records of the police, the prison, and the court, nor is there uniformity among the states regarding the stage in the trial process at which a death sentence is imposed, and, thus, becomes reportable as such. We decided to employ the federal records as the reliable starting point. We obtained from the Bureau of Prisons copies of the work sheets for the years 1963, 1964, and 1965 which were used in the preparation of its publication *National Prisoner Statistics—Executions*. These work sheets gave us the name of every individual sentenced to death during each of these years, the date of sentencing, offense, sex, race, and date of birth. We disregarded all cases where death sentences were imposed for crimes other than murder but included cases where an individual was sentenced to death for rape and murder.

The next step was to examine the decisions in all cases which have been taken to a higher court and decided by that court. Cases not appealed, or pending an appeal, were not included in our analysis.

There were, altogether, 230 individuals listed on the government work sheets for the years 1963, 1964, and 1965: 81 cases in 1963; 89 cases in 1964; and 60 cases in 1965. (See Table II for disposition on those cases on review.)

The next step was to find, photocopy, and read all available court opinions. For this portion of our study, we had to rely on the court opinions. We could not, as we did in the Illinois cases, read the "abstract" which contains, somewhat condensed, the testimony of each witness. There may be cases where scientific evidence was presented at the trial by the prosecution or defense but such evidence was not mentioned in the court opinion. For this reason, we must be circumspect in our conclusions in this portion of the study. But we feel justified in drawing some conclusions, and partic-

duced that the barrel and the stock had been sawed off the gun. Since the murder case is not yet decided by the Illinois Supreme Court, the case is not included.

ularly when we know that the defense presents a written brief to the court containing a statement of facts. This statement is subject to comment by the prosecution in its brief. There is oral argument before the higher court and then a study of the case by the court. Because it is a capital case, we assume a thorough study of the matter by the court.

In this light, our approach to the opinions was as follows: If the court decided a case on an issue which did not require a full statement of facts, or if the court did not attempt to state the facts fully, we did not include the case for analysis. We included only those cases where the court purported to give a complete statement of the facts. To us it seems unlikely that there were many cases where evidence seriously pressed upon the court by prosecution or defense, scientific or otherwise, would escape mention by the court. Further, to the extent that such evidence did go unmentioned, there is no reason to believe it differs as to type from such evidence which was mentioned.

Let us look first at the 1963 data which is the most complete. Of 81 cases, 8 are still undecided. We eliminated from our study 16 cases, because the reported decision failed to include a complete statement of facts. Thus, we were left with 57 cases subject to analysis. Of the 57 cases, the prosecution relied on confessions in 31 cases (54%).

We found that scientific evidence of one form or another was introduced in 15 of these 57 cases (26%) and that there were 22 instances in all where scientific evidence was presented.² The breakdown as to type of evidence is as follows:

Blood Typing—	5 cases
Firearms identification (Ballistics)—	5 cases
Fingerprint identification—	3 cases
Other—	9 cases
	—
	22 cases

There were 19 California cases included among the 57. Of the 15 cases throughout the entire country in which scientific evidence was introduced, 10 were from California. Thus there were only 5 cases from other parts of the country. These included 2 cases (companion cases) from the District of Columbia, 1 from Georgia, 1 from Massachusetts, and 1 from Texas.

² In two Arizona cases (companion cases) there was testimony that bloodstains and hair were found on a rock, but it is not clear that the blood and hair were identified as such by expert testimony. These cases are not included.

Let us consider these 5 cases first: In the District of Columbia cases, the scientific evidence employed consisted of blood type testimony, plus testimony that a bloodstained heel mark found on the deceased had been made by the heel of the boot of one of the defendants. In the Georgia case, the scientific evidence was a firearms identification test of a shotgun shell. In the Massachusetts case, the prosecution, in addition to the introduction of firearms identification testimony, introduced the testimony of a medical examiner as to the course of a bullet. In the Texas case, the scientific evidence was that a gas line had been cut by defendant's pipe cutters.

Based upon these cases, our conclusion is that the scientific evidence introduced by the prosecution in the 1963 cases, while more varied than in the Illinois cases, was nevertheless limited in scope and imaginativeness.

In the California cases there was a more sophisticated approach. In addition to blood typing, firearms, and fingerprint testimony, other forms of scientific evidence were introduced in 6 cases. These decisions give an indication of what might be done generally.

In one case, defendants were convicted of murdering a bartender in their car. In addition to blood group evidence respecting the blood of deceased and blood stains in the car, there was evidence that numerous fibers taken from the victim's shoes matched those found in the defendants' automobile, that hairs found in the automobile matched those of the victim; and that red paint found on the floor mat of the defendants' automobile came from the shoes of the victim.

The other five cases involved a typewriter comparison, 2 forensic medicine cases (presence of semen), one soil matching case, and one matching of bloody footprints.

For 1964, there were 89 cases, of which 54 were subject to analysis (See Table II). Six cases were eliminated as duplications of names previously entered by the Bureau of Prisons for 1963.³

Confessions were relied on in 31 cases (57%). Scientific evidence was employed in 18 cases (33%) representing, in all, 10 states. California contributed scientific evidence in 3 of these cases.

³ This was evidently due to an oversight since it is the announced policy of the Bureau to list an individual only once on its annual report and then in the year in which he is first sentenced to death. If the conviction is set aside and he is subsequently sentenced to death, he is not supposed to be included in the figures for the later year.

TABLE II
INDIVIDUALS SENTENCED TO DEATH FOR MURDER 1963-1965

DISPOSITION OF CASES

(SOURCE: NATIONAL PRISONER STATISTICS 1963-1965, PUBLISHED COURT DECISIONS AND CORRESPONDENCE)

	1963	1964	1965
Total cases reported by Bureau of Prisons	81	89	60
Affirmed	38	42	16
Affirmed, sentence reduced	6	2	
Affirmed as to guilt, reversed and remanded as to penalty only	7	2	
Reversed and remanded	22	13	4
	—	—	—
Total decided on merits	73	59	20
Not decided on merits:			
Pending in reviewing court	8	18	37
Duplicate entry of prior year		6	1
Reversed or remanded without opinion		1	1
Facts not stated		1	
Deceased before decision of reviewing court		1	
New trial granted by trial court—Followed by life sentence		1	
New trial granted by trial court—Pending		1	
Remanded, decision reserved		1	
Declared insane. No appeal			1
	—	—	—
Total not decided on merits	8	30	40
Total decided on merits	73	59	20
Facts not stated in opinion	16	5	2
	—	—	—
Cases available for analysis	57	54	18
	==	==	

Again nearly half of the cases fell within the traditional pattern:

Blood Typing—	2
Firearms identification (Ballistics)—	5
Fingerprint identification—	3
Other—	10
	—
	20

The "other" cases, as for 1963, reveal what evidence can be found when the police are prepared to approach an investigation scientifically. Texas identified the hat of a defendant by hair comparison. Pennsylvania presented evidence that the pants of a defendant, accused of murder of a boy, were splattered with brain tissue. Pennsylvania also, in a murder and possible rape case, presented evidence the victim had had intercourse within 10 days of death and that there were semen stains on the defendant's shorts. No semen was found in the vagina of the victim, however. California brought in a handwriting expert to testify that a defendant had made a sketch of a savings and loan associa-

tion. The defendant was charged with murder committed during a robbery of the association. California also produced expert testimony as to the course of a bullet in a grocery robbery-murder. Arkansas produced the cast of a foot print at a murder scene which matched the defendant's. In another case it identified liquid found in a car as kerosene. The defendant was charged with the murder of several members of his family and setting the home on fire with kerosene. Alabama charged a defendant with the rape of a girl and the murder of a conservation officer who came to her aid. There was testimony that there was blood and fatty material of human origin on a knife and that the tail light assembly of the defendant's car had paint on it which matched the paint of the car of deceased. This evidence was significant because of other evidence that the defendant's car had collided with the car of the deceased.

One case of particular interest was from Arkansas. The defendant was accused of the rape-murder of a housewife surprised in her home while ironing. There was testimony as to the presence of

semen in the vagina of the deceased, but the most dramatic evidence, even though not "scientific" in character, was a burn mark on defendant arrested shortly after the crime. The victim had put up a struggle and the outline of the burn matched exactly the impression of her iron.

Unquestionably the most bizarre and fascinating case arose from Ohio. Defendant and one Riddle checked into a motel in Stark county. Subsequently, Riddle's body was found in a burned auto, some distance from the motel in Wayne county. At the defendant's trial for murder in Stark county, he testified that, upon returning to the motel room after a brief absence, he found Riddle dead. He placed the body in his car and drove around for two days. Defendant chose County Line Road, which divides Stark and Wayne counties, for the final scene. At the top of a hill he soaked the body and car interior in gasoline, ignited it and started the car, in flames, down the hill. The State claimed Riddle was alive when incinerated. This certainly cast grave doubt on the reliability of defendant's tale and his unusual behavior, and it counted heavily against him. Scientific evidence in two crucial areas supported his strange version. Both the State and the defense established by expert testimony that Riddle had severe heart disease—his life expectancy, according to his doctor, could only be foretold from day to day. Further, there was expert testimony by the defense, largely concurred in by the State, that carbon monoxide is present in bodies of victims burned while alive and that the blood of Riddle contained no carbon monoxide. The Ohio Court of Appeals reversed the conviction and granted a new trial in part on the ground guilt was not proved beyond a reasonable doubt, and in part on the ground (intriguing to lawyers) that venue did not lie in Stark County.

In this case, but for scientific evidence, an innocent man might well have been convicted, because of grossly incriminating circumstances and his own odd behavior.

For 1965, the data is still fragmentary. Of 60 cases, 37 cases remain undecided and 5 had to be rejected for many of the same reasons that compelled rejection of cases in 1964. Included among the 5 was one duplicate from a prior year. Thus, only 18 cases could be analyzed. Of these 18 cases, confessions were presented in 7 cases (39%). Scientific evidence was introduced in 6 cases (33%). In three instances (two in Georgia and one in South Carolina) firearms identification testimony was introduced. In one California case, de-

fendant's palm print was found in the cab of a taxi driver he was accused of murdering. In a Texas case, defendant was accused of murdering a woman in her home at night. A hair, found on defendant's pistol, matched the victim's; defendant's shoes had mud on them like that in the victim's yard, and plaster casts of foot prints in the yard matched defendant's shoes. In one New Jersey case, the prosecution charged robbery and murder, followed by burning the corpse. To prove the robbery, there was scientific testimony that no gold was found among the remains, whereas there was testimony that deceased customarily wore a gold ring.

All in all, we think the record is dismal. True, there are occasional cases where evidence out of the ordinary is presented, but on the whole, it seems clear that scientific evidence is presented in a minority of the cases. And, when it is presented, almost without exception it consists of one of the three standbys used for decades.

Thus, during a 3-year span, we could study 129 cases (57 + 54 + 18). In all, there were 50 occasions (22 + 20 + 8) where scientific evidence was introduced in 39 cases (15 + 18 + 6). Of the 50, the old standbys accounted for 26 instances (13 + 10 + 3) or about 50%. Most of the 24 remaining instances employed unsophisticated or even elementary techniques. The only instances we consider as exceptions are these 7 cases: Texas pipe cutter case, the impressive array of facts in the California bartender case, and the California soil matching case, the Texas hat case, the Pennsylvania boy murder case, the Alabama conservation officer murder, and the Texas array of facts in the cab driver case.

The "array" cases such as the two mentioned above illustrate that once scientific evidence is sought more than one item of evidence may be found.

In reading the cases we were struck by the fact that in almost every instance there was no attempt to conceal the fact that murder had been committed. In fact, we recall only two exceptions: in a California case, the murderers concocted an elaborate plot to murder the husband-wife motel keepers, mask their disappearance, hide the bodies, and assume ownership of the motel. In one Illinois case (Vincent Ciucci), a husband shot his wife and children and then set the house afire to make the deaths appear as if due to fire. All this, because he had a girl, named by a strange trick of fate, Carol Amora.

Perhaps murder masked as natural death is rare. Or perhaps when discovered, capital sentences are not imposed. But we suspect that given the lack of sophisticated techniques in convicting the murderer where murder is obvious many murderers successfully conceal their crimes.

We have shown that the defense almost never utilizes scientific evidence. For the indigent defendant, the reasons are obvious. Even if he is given competent counsel, he is not provided an investigative staff and funds. Even the defendant who has funds has problems. By the time counsel is retained, the trail is usually cold. The key evidence frequently is in the hands of the prosecution, it may be impossible for the defense to obtain access to it. Finally, a truly scientific study of a criminal case requires a broad spectrum of experts and a coordinator who knows what can be done and who can do it. Such individuals and galaxies of specialists exist only in the largest cities.

The Ohio motel case is the outstanding illustration of the use of scientific evidence by the defense. There, it was a significant fact in the reversal of a capital sentence. It was achieved by bringing in Dr. Milton Halpern, Chief Medical Examiner of New York City to testify. The prosecution sought to counter the defense, but its presentation was flawed by an omission of a key fact from the report of one of its experts.

We do not suggest for a moment that scientific evidence can or should replace traditional modes of proof. Thus, for example, the California motel keepers' case demonstrates the value of careful, patient police work in assembling a massive case. Only a small part of the evidence was "scientific" as such, but in a broad sense, the presentation was truly scientific.

Nevertheless, factual determinations can be exceptionally complex. Consider for example, the storm of controversy on the issue whether the bullet which hit President Kennedy also struck Governor Connally. We should bring to bear every resource, including traditional techniques, to resolve these issues.

Modern technology ought to play a much greater role than it does now. We have the capacity to investigate the most distant reaches of the universe, and to tear apart the atom, yet, when we put men on trial for their lives we bring to bear almost none of this vast scientific capacity.

If we are to make full use of science and be truly scientific—and *fair to the accused*, the task will be hard for several reasons. We cannot simply

establish a super laboratory in Washington to which police throughout the country can send material for analysis. A national laboratory, far beyond the scope of the FBI laboratory would be a forward step, but to be truly effective, it must draw upon a national spectrum of experts. Beyond this we must have well trained local investigators of technical knowledge and imagination. The national laboratory can scarcely rise above the material sent to it and this in turn will depend upon the skill of the local investigators.

There is another dimension to the problem. Science must be used not merely to convict the guilty, but to free the innocent. It is inevitable that the police, being first on the scene, will marshal the evidence. Road blocks which bar examination of the physical evidence by the defense must fall. And, even today, the prosecution—how often no one knows—engages in the scandalous practice of concealing exonerating evidence, permitting its expert to tell half truths and engaging in similar disreputable practices. We do not make this charge lightly. It is based upon case after case documented in the courts. Despite repeated denunciation of such practices by the courts, they have continued, and we fear they will continue.

If we are to really use science to solve crime, we must not mar the achievement by the stain of dishonest methods which are the antithesis of science. A growing professional spirit among investigators may lessen the problem. Yet, so long as men's advancements and reputations depend on results, there will be the temptation to trifle with the facts. The criminal prosecution is an adversary process. Largely, this process serves us well. But when the prosecution stoops to suppression and misrepresentation of evidence, it hides the truth the trial is designed to elicit. Suppression and misrepresentation occur, moreover, not only because of calculation or malice, but also because every investigation must proceed not upon a witless collection of facts, but also upon a hypothesis. We like to see our hypotheses proved right and as we become more committed to them the less easy it is for us to admit their error or even to see the possibility for error. Hence, the manifest importance of countering this inevitable tendency. For this, the defense must have full and unrestricted access to the facts. It must have well paid, competent investigators and it must have full access to scientific laboratories. Only then will we bring the potentialities of our technology to the service of justice.