THE SCIENTIFIC CRIME DETECTION LABORATORY

J. EDGAR HOOVER*

THE Federal Bureau of Investigation of the United States Department of Justice years ago realized the need for careful consideration of evidence in criminal cases by trained technicians. Acting to meet this need, a Technical and Research Laboratory was established in the fall of 1932 at Washington, D.C., to assist in the current investigations conducted by the FBI's Special Agents and to make available to police and law enforcement officers the scientific aids to criminal investigations. In addition, research work in police sciences is conducted in the Bureau's Technical Laboratory at Washington, and numerous contributions to the field of science in law enforcement are made through the FBI Law Enforcement Bulletin and other publications.

The manner and method of operation of the FBI Technical Laboratory are designed to give to the courts and juries disinterested, judicial, expert testimony. The Bureau experts are not interested in securing convictions, but only in reporting the results of their scientific findings.Their efficiency and status are not judged by the number of convictions, but rather by the skill of the work which they perform.

The Laboratory is composed of scientists, each one of whom is a specialist in his particular field, and each of whom has been thoroughly investigated and whose character, reputation, and integrity are beyond reproach. The scientist must be of unquestionable character and unbiased, so that after a disinterested methodical study of the evidence, he can arrive at a conclusion as to the existing conditions and interpret them in the best interests of justice. The criminological scientists of the FBI have risen in distinction and increasingly gained the confidence of the investigators, the prosecutors, and the courts.

The conclusion of the laboratory technician following his examination of evidence submitted has a distinct, twofold value. First, it furnishes the investigator with definite information concerning the condition of the evidence and the meaning of such condition. Second, to the prosecutors and to the courts, these conclusions of the expert when properly reached by sound and approved methods furnish conclusive, demonstrative evidence of a most desirable kind.

* Director, Federal Bureau of Investigation, U.S. Dept. of Justice.

The services of the FBI Laboratory are available to the following groups:

A. *In criminal and noncriminal investigations.*—To all branches of the federal government, including the Army, Navy, and Marine Corps.

B. *Criminal investigations only, except in examination of handwritten or handprinted documents.*
   1. Duly authorized law enforcement agencies.
   2. State and local Civil Service Commissions.
   3. Coroners and medical examiners.
   4. State and local governments or agencies thereof.
   5. Railroad terminal police and railway express agencies.

The functions of the FBI Laboratory are:

A. *Blood examinations.*—Examination of blood and other body fluids found during investigations of such types of cases as homicides, robberies, criminal assaults, hit-and-run accidents, etc., are made.

B. *Toxicological examinations.*—Organs and tissues from victims in suspected poisoning homicides are examined, and analyses of food and drinks for poisons are made. Carbon monoxide determinations are made on blood. Urine, blood, and spinal fluid are tested for alcohol.

C. *Firearms identifications.*—Bullets and cartridge cases can be identified as having been fired in a certain gun.

D. *Powder patterns.*—Examinations are made on clothing to determine the distance at which the muzzle of the gun was held at the time the shot was fired into the object being tested.

E. *Bombs and explosives.*—There is maintained a file of dynamite wrappers, blasting caps, and fuses in order that these known standards may be compared with material found at the scene of an explosion.

F. *Tool marks.*—Tools leave marks on metals that are characteristic of the tool. A tool, such as a pipe wrench, can be identified by the marks it leaves on a bar, pipe, safe knob, etc.

G. *Number restoration.*—Obliterated serial numbers can be restored on articles such as guns, typewriters, motors, tools, etc.

H. *Glass fractures.*—Fragments of headlight lenses are examined to determine make and model of car from which they came, and to determine if different fragments came from the same source.

I. *Document examination.*—Examinations are made of handwriting, typewriting, printing, paper, erasures, alterations, obliterations, bogus checks, etc.

J. *Cryptanalysis.*—Code and cipher material is examined to determine its full import.

K. *Microscopy.*—Hairs, fibers, soils, and minerals are examined for identity and origin.

L. *Metallurgical examinations.*—Metals of numerous types are examined, their internal structures studied, and comparisons made with known samples.

M. *Spectrography.*—Small samples of paint, such as found in hit-and-run accidents, and small chips of metal, such as may be found in the teeth of a hacksaw blade, are analyzed by the spectrograph.

N. *Chemical examinations.*—Qualitative and quantitative analyses are conducted on organic and inorganic substances that may be found at the scene of the crime, in the possession of, or on the premises of the suspect.

O. *Microchemical examinations.*—Spot tests are very valuable in determining identity of small samples of material. Identification of secret inks in espionage matters is a typical example.

P. *Special photography.*—Problems in the treatment of under- and over-exposed negatives, ultra-violet and infra-red light, and the restoration of altered, defaced, or burned documents demanding special handling are handled.

Q. *Miscellaneous examinations.*—Moulage and plaster of paris casts are made of perishable evidence, such as apple cores or cheese. Casts of tire tread and footprint impressions are examined. Botanical, pharmaceutical, and bacteriological examinations are made.

In addition to making these examinations in the Technical Laboratory, the FBI will also furnish the experts necessary to testify in connection with the results of their examinations in either state or federal courts, all without cost to the local law enforcement agency.

The work of the FBI Laboratory was extended at the inception of the emergency period three years ago to include highly confidential and technical work in connection with national security investigations. No basic change in the work of the Laboratory was entailed, but its activities were considerably expanded and multiplied. The wartime work of the FBI in

combating espionage, sabotage, and other subversive activities has resulted in a heavy increase in laboratory examinations.

A total of 14,589 examinations were conducted in the FBI Laboratory during the fiscal year 1941. The types of examinations and number of each made during the past fiscal year, 1942, are as shown in the accompanying table.

	1942
Examinations of questioned documents	5,885
Confidential analyses	12,332
Cryptographic analyses	29,306
Microscopic analyses:	
Fibers	260
Petrographic and geologic	342
Metallurgical	181
Chemical analyses:	
Toxicological	61
Biochemical	206
General chemical	415
Firearms:	
Guns and ammunition	484
Number restoration	45
Gunpowder tests	24
Tool marks	303
Spectrographic	241
Explosives	96
Footprint and tire tread	54
Glass examinations	36
Miscellaneous	1,204
Total	51,475

Examinations for the first three months of the fiscal year 1943 totaled 47,433.

In the examination of this tremendous volume of evidence, new applications of scientific methods in crime detection have been and are daily being found whereby science may assist the courts and juries in reaching proper verdicts, and it is to this end that the facilities of the FBI Laboratory are dedicated.