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A Tax Exempt
Non-Profit Corporation
Identification Number: 237050691

THE FORENSIC SCIENCES FOUNDATION, INC.
11400 ROCKVILLE PIKE • ROCKVILLE, MARYLAND 20852 • (301) 770-2723

FINAL REPORT

Second Grant Year

#77NI-99-0070

October 3, 1977 - April 2, 1979

Forensic Sciences Certification Program

Submitted to:

U.S. Department of Justice
Law Enforcement Assistance Administration
ATTENTION: Financial Management and Grants
Administration Branch
Washington, D.C. 20531

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November 21, 1979

Law Enforcement Assistance Administration
U.S. Department of Justice
Washington, D.C. 20531

ATTENTION: Financial Management and
Grants Administration Branch

Gentlemen:

This is a letter of transmittal for the FINAL REPORT on Grant #77NI-99-0070, which is attached.

The period covered by this report is October 3, 1977 to April 2, 1979.

This report is submitted in compliance with instructions in LEAA letter, Subject: Grant Award #77NI-99-0070, dated August 25, 1977.

Sincerely,

Kenneth S. Field

Kenneth S. Field
Interim Executive Director

dr

Enclosure: Final Report

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ABSTRACT

During the second year public demand for professional accountability and competence in the forensic sciences work force continued, and two additional disciplines, Anthropology and Document Examiners, joined the ranks of Toxicology, Odontology and Psychiatry - a total of five (5) - with each now having an operational non-profit certifying Board incorporated in the District of Columbia.

The objective of each Board is to establish, enhance and revise as necessary, standards of qualification for those who practice forensic science and to certify as qualified specialists those voluntary applicants who comply with the requirements of the Board. In this way, the Board aims to make available to the judicial system, and other publics, a practical and equitable system for readily identifying those persons professing to be specialists in the forensic sciences and who possess the requisite qualifications and competence.

During the second year the Criminalistics Certification Study Committee continued to meet actively as a group and because of their many sub-specialties and the diverse regional membership within the group, progress toward a viable Certification Program will not materialize until approximately January or February of 1980.

The first edition of the Forensic Sciences Certification Program "Directory of Diplomates," designed to provide to the courts an annually increasing

number of highly qualified "expert witnesses" and a means to identify them, will be republished with an increase from ninety-six (96) identified "expert witnesses" to a new total of two hundred and forty (240).

Applications received and individuals certified increased as follows:

Discipline	Applications From	Applications To	Certified From	Certified To
American Board of Forensic Toxicology, Inc.	102	185	44	110
American Board of Forensic Odontology, Inc.	63	65	34	41
American Board of Forensic Psychiatry, Inc.	13	137	0	29
American Board of Forensic Anthropology, Inc.	0	29	0	22
American Board of Forensic Document Examiners, Inc.	0	112	0	57

Much work is needed to continue to field test the existing programs through the cycle of certification, primarily in the area of the credentialing and examination phases, to research the area of continuing education, the various options open in the area of recertification, and finally to the establishment of a national viable certification program in Criminalistics.

INTRODUCTION

The need unequivocally to identify forensic scientists qualified to provide essential professional services for the nation's judicial and executive branches of government has long been recognized. In response to this professional mandate, certifying Boards within several disciplines were organized to provide, in the interest of the public and the advancement of the science, a program of certification in the forensic sciences.

Early recognition of the fact that group decisions by a process of due deliberation and substantial agreement were vital to the success of the program and could only be attained by meeting together, unencumbered by conflicting obligations, resulted in a request for funds from The Law Enforcement Assistance Administration (LEAA). Two LEAA grants proved to be the catalyst needed to overcome the traditional "inertia" and bridge the gap to a program of highly significant accomplishments.

> *In a period of approximately two (2) years, two hundred and fifty (250) forensic scientists in seven (7) separate disciplines were able to attend thirty-six (36) meetings in fifteen (15) cities across the country, reflecting an impressive amount of free, contributed service by the profession, supported by LEAA funds where bits and pieces were forged into accomplished tasks.*

In purpose, function and organization, the established Boards are analogous to the certifying boards in various medical specialties and scientific fields.

- The American Board of Forensic Toxicology - 1975
- The American Board of Forensic Odontology - 1976
- The American Board of Forensic Psychiatry - 1977
- The American Board of Forensic Anthropology - 1977
- The American Board of Forensic Document Examiners - 1977

The objective of each Board is to establish, enhance and revise as necessary, standards of qualification for those who practice in the various disciplines of forensic science, and to certify as qualified specialists those voluntary applicants who comply with the requirements of their respective Board. In this way, the Board aims to make available to the judicial system, and other publics, a practical and equitable system for readily identifying those persons professing to be specialists in the forensic sciences and who possess the requisite qualifications and competence.

The Boards are tax exempt non-profit organizations incorporated in the District of Columbia and administered by the Forensic Sciences Foundation, Inc. Each Board is composed of officers and other directors, who serve staggered terms and are elected from among nominees of designated nominating organizations, or serve at-large.

WHAT IS CERTIFICATION?

Certification is a voluntary procedure by which a non-government organization attests to the professional qualifications of specific individuals. The organization is usually a professional society or separate board concerned with the individual's specialized field of work.

WHY CERTIFICATION?

- Certification helps the public to select individuals who meet a specified set of standards by identifying the individuals who have special competence in their field, thereby performing a valuable public service.
- Certification tends to improve the overall professional competence in a field and thus promotes the public welfare.
- Certification raises the public respect for a profession.
- Certification gives the individual a form of desired peer recognition and enhances his prestige.
- Certification can improve the financial status of certified practitioners who may be assumed (rightly or wrongly) to be more competent than individuals who are not certified.
- Certification, unlike state licensing, is national in scope, thus it does not limit a person's geographical mobility in the U.S.
- Periodic recertification of certified individuals encourages them to stay professionally up to date through participation in a continuing education program.

BACKGROUND HISTORY OF THE FORENSIC SCIENCES CERTIFICATION PROGRAM

Former President Mason of the American Academy of Forensic Sciences, through the issuance of the Mason White Papers, February 20, 1974, declared:

> *If the AAFS does not have an operating certification program embracing all of the defined subdivisions of the forensic sciences, thus spelling out requirements for practice at the highest level, then the risk that other agencies will make the recommendations to be imposed becomes very great. It therefore seems proper that the Academy should carefully consider the question of whether to undertake certification. Because of the many issues involved in terms of desirability and the complexities of implementation, it is an appropriate task for a committee which includes members having experience with other certification programs. I have, therefore, appointed such a committee to be charged with (a) making a recommendation regarding desirability and feasibility of an Academy certification program, and (b) if desirable and reasonable, outlining a structure of implementation for consideration.*

In keeping with this initial mandate, the American Academy of Forensic Sciences Committee on Certification pursued its assigned task by correspondence, telephone and through individual personal contacts and finally on February 6, 1975, the Committee Chairman reported as follows:

> *That steps be taken to implement certification immediately, since if not accomplished by the Academy, it would probably be accomplished by another organization or organizations forthwith. The importance of initiating this procedure at once was emphasized and it was suggested that such a process should include not only members of the Academy but all those recognized as experts outside the membership of the Academy. The Committee felt that the vehicle best suited to accomplish this task was the Forensic Sciences Foundation, emphasizing that the Foundation would serve only as an administrative unit to affect the certification procedure enacted by the Academy membership.*

With initial guidance well in hand, the Foundation took over the dual task of seeking funds for the Program and expanding on the initial guidance to the field. Requests for funds were dispatched to the Ford Foundation, the National Science Foundation, and to the Law Enforcement Assistance Administration. Both the Ford Foundation and National Science Foundation indicated an interest in the project but lacked funds to offer any financial assistance. LEAA responded

favorably and on May 20, 1976 a grant was approved for a Certification Program in the amount of $140,434. During the latter half of the first year grant a second proposal was submitted to LEAA to continue support for a second year and in August, 1977 LEAA approval was received for an additional grant of $171,836.

WHAT IS THE FORENSIC SCIENCES CERTIFICATION PROGRAM?

In any area of expertise, a relative standard of competence must be developed in order to judge the quality of the information rendered by the expert. To this end, the Foundation established a Program working with several professional Boards/Planning Committees to research the problems and requirements unique to each discipline and to formulate separate detailed plans to certify professionals within each discipline, thereby facilitating the task of judicial and law enforcement personnel in identifying qualified experts.

PRIMARY GOAL

The primary goal of this program is to facilitate the deliberation, research structuring and field testing efforts of six separate forensic science Certification Planning Committees/Boards by providing each with the following: research support, administrative support, the means to conduct working research planning meetings and the capability to promulgate research findings, information, and instructions ... to the end that the myriad tasks involved in the research/design of certification programs will be accomplished in an orderly and a timely manner.

OBJECTIVES AND NEED

a. Objectives

- To organize six separate forensic science discipline-oriented certification planning and research committees composed of nationally recognized leaders in the disciplines concerned.
- To research the problems and requirements unique to each discipline and to formulate separate, detailed plans for the certification of professionals within each discipline.
- To field-test each component of each voluntary certification program as developed ... to include complete systems if developed during the time frame of this project.
- To inform the professionals concerned, the "users" of the end products and the public of the research effort and the value of each program.

b. Need

1) Quality and Equality

The United States through its people and through its organized network of governments, is continually dedicated to the task of improving the quality and equality of justice -- whether through the enactment of laws or by the improvement of the system in which the laws are implemented.

One of the many facets of the justice system in need of minimum standards is the forensic science work force.

There is a direct correlation between the improvement of the qualifications of an individual in the system and the improvement of the quality of the system. Similarly, there is a direct correlation between the improvement of the qualifications of all related persons in the system and the improvement in national equality of justice.

Professional credentialing is a complex, multifaceted activity, involving determination and recognition of the professional qualifications of three distinct entities: individuals; operating agencies; educational and training institutions.

It is the consensus of opinion of leading law practitioners, legal scholars and students of the law that legal proof is rapidly evolving into a multidisciplinary mosaic of law, science and technology. As a consequence of our modern age, in which increasing specialization is deemed a desirable means of solving difficult problems, *scientific evidence* and *expert testimony* have become indispensible in many types of criminal investigations and in the trial of criminal cases. Adding to the cause of scientific evidence have been the limitations placed on the traditional methods of suspect interrogation.

The term "scientific evidence" covers, of course, a range of evidence varying widely in probative value, weight and persuasiveness. Some sciences accommodate the formulation of an opinion with mathematical certainty; others are less precise. The various sciences and techniques are allied, however, in at least one respect: *their secrets are unlocked by specially trained experts.*

2) Quantity

The evidentiary use of the expert witness in the field of Forensic Science is on the upswing. Scientific evidence is highly credible, both to judges and jurors.* Expert scientific opinions based on scientific analysis of evidence related to a crime provide, in countless cases each year, evidence which pushes the probability of an accused's innocence or guilt beyond a reasonable doubt.

Present judicial procedures direct that the trial judge must decide whether a witness is qualified to testify as an expert. Logic suggests that the witness must have special knowledge or experience relating to the subject at hand. Unfortunately, in practice, judges cannot keep up with the rapidly advancing state-of-the-art and, therefore, may base their decision on the question of whether the person has previously testified as an expert in his field of knowledge. Unfortunately, such a means of qualifying may have little real value in measuring current professional qualifications in the fornesic sciences. Needed is a national system of individual certification . . . a system that culls those who do not meet logical, reasoned minimum professional and ethical standards.

Historically, all certification programs for individuals and all companion accreditation programs for facilities and educational

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* LEAA study "Assessment of the Personnel of the Forensic Sciences Profession" -- Grant #73-NI-99-0052-G, June, 1975: of 1363 judges and trial lawyers queried, 92% desire greater utilization of forensic science personnel skills because of their credibility in the legal decision making process and 74% stated that a system of certification was an "important" criteria in determining the qualifications of prospective expert witnesses.

institutions have met with opposition from within the profession. It is therefore of considerable significance that the approximately 1,500 scientific members of the AAFS approved the principle of certification and directed the Forensic Sciences Foundation to implement their decision.

3) Uniform/Equal Support

Although each of the disciplines involved has a distinctly different certification problem to address and an equally distinct environment in which to operate . . . each has a need for a minimum level of planning and research support. In this instance such support ranges from the time donated by discipline experts who can make substantive contributions to the solution of the problems, to the financial support needed to pay for essential research by the staff and through committee meetings and for the administrative backup necessary for such an effort.

RESULTS OR BENEFITS EXPECTED

Funds generated for this program will be utilized to greatly enhance the contribution made by the forensic sciences to the quality-equality of justice by providing for a higher degree of professionalism within the multidisciplinary work force. In a time related manner this benefit will be reflected in:

- An increase in "physical evidence examined" (in quantity and in quality).

- A material contribution to a reduction in the number of cases entering our overloaded court system by improving pretrial screening, i.e. allowing decisions to be made as to whether a case merits a court hearing to be based more on scientific fact than on circumstantial evidence.
- A potential decrease, nationwide, in court time by providing an increased number of highly qualified expert witnesses available to the courts . . . and a means to identify them.
- An increase in geographic mobility of the professional workforce (particularly in criminalistics, coroner/medical examiner, and toxicology agencies) through the design of common standards.
- A significant contribution to the betterment of public confidence in the judicial process.

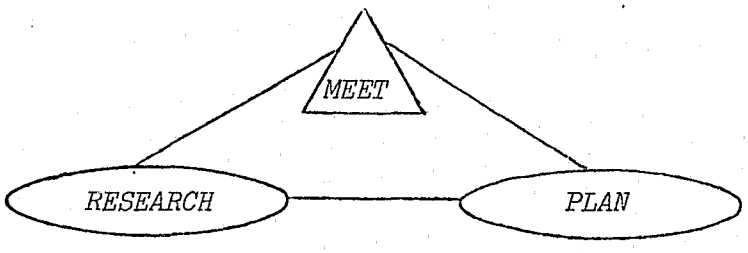
There is now a wide acceptance of the idea of periodic reestablishment of qualifications, usually in association with documentation of continuing education or other formalized means of demonstrating continuing professional competence. Reevaluation, typically at 3-5 year intervals (with due regard for specialization), will be incorporated into the various certification programs from the outset to avoid compromising their later effectiveness.

APPROACH

a. General

The pivotal task to be performed under this program will be the conduct of Research Planning Committee meetings -- since each such meeting will:

- Utilize the products of off-meeting research planning activities.
- Produce selected products.
- Direct further research activities.



The research planning committees are temporary organizational conveniences by which to structure publicly useful certification systems for the professions involved.

In practice, a research planning committee takes its direction from the roles and missions of the certifying or specialty board that will eventually be created to implement the approved certification system. Following are the primary functions of such boards -- and, thus, the current goals of the research planning committees:

1) To establish and periodically to enhance standards of competence for the practice of a specified profession (e.g., criminalistics, forensic toxicology, etc.).
2) To conduct investigations, evaluations, and examinations to determine the competence of voluntary applicants to engage in the practice of the profession.
3) To grant and issue certificates of qualification to candidates who successfully demonstrate their fitness therefor, as evidence of their competence.
4) To stimulate and assist in the establishment and development of adequate educational and training programs and facilities.
5) To advise prospective entrants into the profession concerning recommended courses of study and training required.
6) To make available to the public at large and to various interested parties (such as bench and bar) periodically revised lists of persons who have been granted certificates of qualification.

A specialty board carries out its certifying functions by complete documentation of an applicant's background and by application of identical, nondiscriminatory standards. Board action is based upon the candidate's moral, ethical, and professional record, education, experience and attainments -- plus the results of formal examinations, oral or written.

b. Plan of Action

Given the above goals each research planning committee will proceed to develop its certification system in three phases.*

- *Phase I* will be concerned with the design of the research mechanism needed to accomplish the tasks ahead.
- *Phase II* will be devoted to the research needed to structure a certification system.
- *Phase III* will consist of field tests of designed components.

CURRENT STATUS OF THE PROGRAM

a. General

Despite the fact that LEAA funds were not available until May 24, 1976, two disciplines, Toxicology and Odontology, were able to hold their first organizational meeting and attain a status of incorporation within the District of Columbia during the year 1975 and early 1976. Monies to implement actions for an operating Board

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* It should be noted that each discipline, six in all, will work independently. Some will approach problems one way . . . some another, i.e., criminalistics will be concerned with several sub-specialties, while others have only one specialty.

were acquired through personal donations of both time and money by the Board members themselves and application fees received from applicants seeking certification in each discipline.

In 1977 three (3) more disciplines attained Board status, i.e. the American Board of Forensic Psychiatry, the American Board of Forensic Anthropology, and the American Board of Forensic Document Examiners.

In the course of the past two or more years of research effort the following organizations have joined the American Academy of Forensic Sciences in active support of certification and accreditation activities and in an appeal to see the development on viable programs through to the implementation stage.

- Society of Forensic Toxicologists
- California Association of Toxicologists
- American Society of Crime Laboratory Directors
- American Academy of Psychiatry and the Law
- Northeastern Association of Forensic Scientists
- Mid-Atlantic Association of Forensic Scientists
- Southern Association of Forensic Scientists
- Midwestern Association of Forensic Scientists
- Northwest Association of Forensic Scientists
- California Association of Criminalists
- American Society of Questioned Document Examiners

Further accomplishments are impressive, reflecting a tremendous amount of free, contributed service by the profession -- supported by LEAA funds for research and companion meetings where bits and pieces here have been forged into accomplished tasks.

See on following pages:

Figure #1 - Meeting Cities

Figure #2 - General Status of Disciplines

Figure #3 - Work Products

FIGURE #1 -- MEETING CITIES

THE UNITED STATES OF AMERICA
AND ITS TERRITORIES AND POSSESSIONS
(Outline Map)

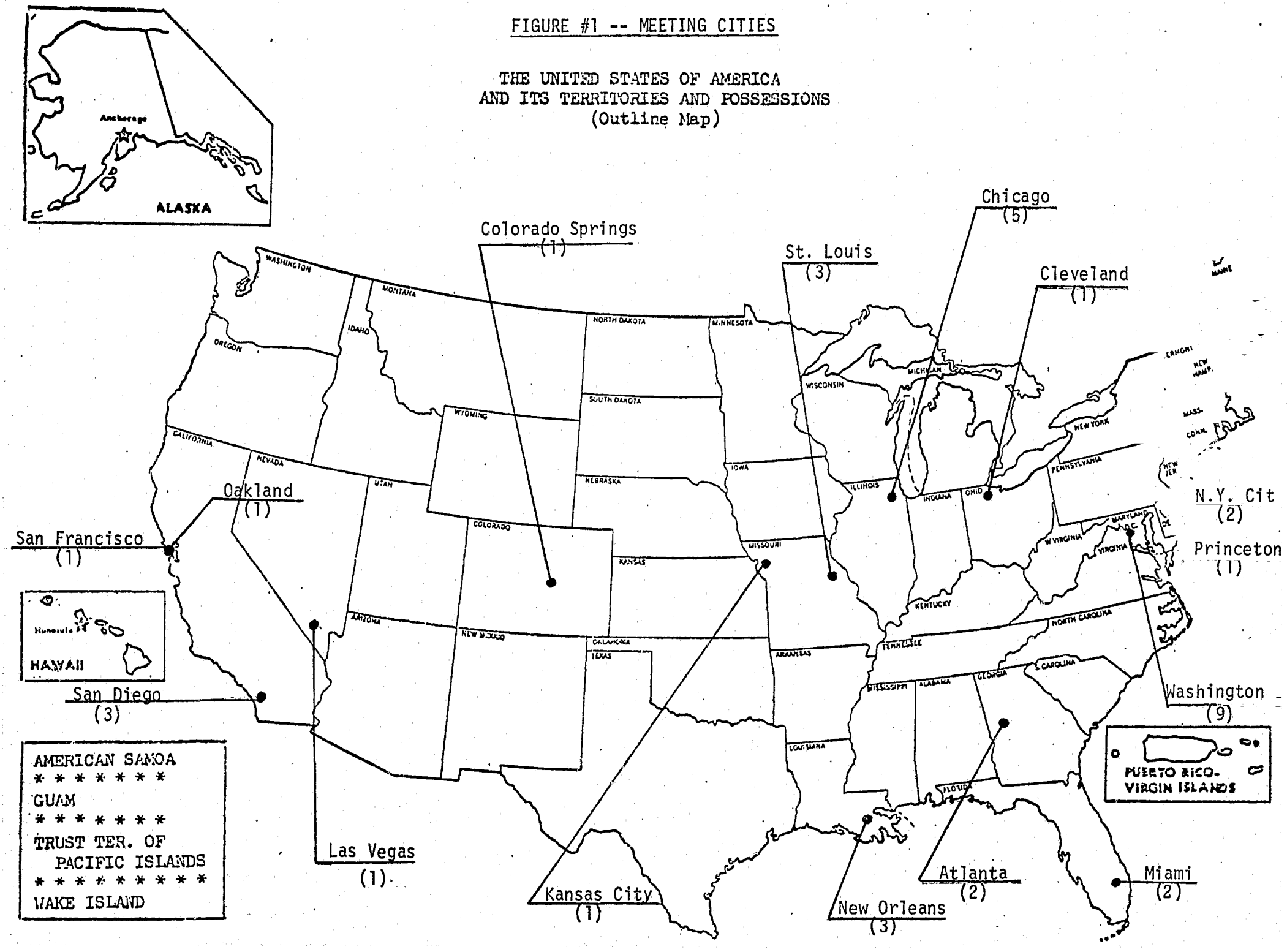

FIGURE #2 - STATUS OF PROGRAM

Disciplines	Initial Planning Group/Board	Incorporated Dist. of Columbia	Bylaws	Standards	Operational Board	Applications Received	Applicants Certified	Meetings under LEAA Grant 1	2	3	4	5	6	Phase I*	Phase II*	Phase III*	Remarks
Toxicology	x	x	x	x	x	185	110	x	x	x				x	x→	w→	
Odontology	x	x	x	x	x	65	41	x	x	x	x	x	X	x	x→	w→	
Psychiatry	x	x	x	x	x	137	29	x	x	x	x	X	X	x	x→	w→	
Anthropology	x	x	x	x	x	29	22	x	x	x	x			x	x→	w→	
Document Examiners	x	x	x	x	x	112	57	x	x	x	x	x		x	x→	w→	
Criminalistics (Certification)	w→							x X	x X	x	x	x	x	w→			
Pathology	- - - →																Board in operation several years. Participation under LEAA Grant will be in areas of continuing education - recertification.

Phase I*: Design of the research mechanism to accomplish the tasks ahead.

Phase II*: Research to structure a certification system.

Phase III*: Field test of designed components.

LEGEND: x - Task Completed
w - Working to Complete Task

FIGURE #3 - WORK PRODUCTS

Disciplines	Articles of Incorporation	Bylaws	Standards	Brochure	WORK PRODUCTS: Letter of Interest	WORK PRODUCTS: Letter of Instruction	WORK PRODUCTS: Applica-tion	WORK PRODUCTS: Directory of Diplomates	Benefits of National Certification Program	Regional Distribution of Meeting Minutes	Regional Distribution of Questionnaires: Serology Hair - Fibers Drug Chemistry	Remarks
Toxicology	x	x	x	x	x	x	x	x				
Odontology	x	x	x	x	x	x	x	x				
Psychiatry	x	x	x	x	x	x	x	x				
Anthropology	x	x	x	x	x	x	x	x				
Document Examiners	x	x	x	x	x	-	x	x				
Criminalistics (Certification)	-	-	-	-	-	-	-	-	x	x	x	See page 57.
Pathology	-	-	-	-	-	-	-	-			→	Board in operation several years. Participation under LEAA Grant will be in areas of continuing education and accreditation.

During the execution of this program "traditional" inertia has been overcome and marked progress has been made toward stated goals. The critical need to maintain this hard earned momentum is evident. Such need ranges from the time donated by discipline experts who have and will continue to make substantive contributions to the formulation of in-being certification and accreditation programs -- to the support needed to continue the financial support of meetings, research, and field testing costs plus project management and administrative expenses.

The entire recredentialing process needs to be implemented, with continuing implementation on a planned schedule, possibly a three (3) to five (5) year cycle. Examinations for establishing initial and continuing competence of applicants for certification must be developed and revised in keeping with the needs of the field. Liaison must be developed with multiple agencies and bodies such as federal and state civil service commissions, judicial conferences, the prosecution and defense bar and higher education. A system of identifying acceptable education in all disciplines must be developed and implemented.

For all of these critical needs there are continuing requirements for manpower, communications, meetings of the concerned parties, etc., all of which translates into a need for financial support beyond the obviously limited contribution the individual practitioners seeking certification can make.

"Outside" funds are needed to support those activities which translate ideas into action. Two years of operation with five certifying bodies has reaffirmed the twenty-six (26) year lesson of comparable certification bodies in the health field that an undertaking of this complexity cannot be translated into functional reality by mail or telephone communication of part-time volunteers, however dedicated. Group decisions by a process of due deliberation and substantial agreement are vital and can only be attained by meeting together, unencumbered by conflicting obligations.

Professional accountability and competence in the Forensic Sciences Work Force can be attained through:

- Step 1 -- Certification
- Step 2 -- Continuing Education
- Step 3 -- Recertification

We are now at the threshold, the first step. The forensic sciences community has shown a growing acceptance for a nationwide Certification Program. Certification and the public can only be satisfied by completion of the full cycle, Steps 1, 2, and 3.

STATUS BY DISCIPLINE

Toxicology

- What is Forensic Toxicology?

Forensic Toxicology is the study and understanding of the harmful effects of such external substances as poisons, drugs, pollutants, and potentially toxic chemicals which may be introduced into living systems. The forensic toxicologist works in the areas of drugs and abuse, toxicological aspects of criminal investigations and postmortem cases.

- The American Board of Forensic Toxicology, Inc.

The formation of the American Board of Forensic Toxicology was approved unanimously at a meeting of the Committee on Certification and Standards of the Toxicology Section, American Academy of Forensic Sciences in Kansas City, Missouri, August 7, 1975. A second meeting October 18, 1975 saw the promulgation of Bylaws and Resolutions under which the Board would function. The Board was incorporated in the District of Columbia on November 6, 1975 and assumed an operational role with the formal approval of the minutes of its first organizational meeting completed on January 3, 1976.

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- Certification Requirements

1. General Qualifications

   a. Applicants must be persons of good moral character, high integrity, and good repute, and must possess high ethical and professional standing.

   b. Only permanent residents of the United States of America and its territories and possessions, or of Canada and its territories, are eligible for Certification.

2. Education (See also Section 5 below)

   a. Applicants must possess an earned Doctor of Philosophy or Doctor of Science degree in one of the natural sciences, from an institution acceptable to the Board. (Acceptable institutions are those accredited by Regional Accrediting Commissions recognized by USOE, those whose pertinent educational programs e.g., in chemistry, were at the time accredited by national accrediting agencies recognized by USOE, and other institutions in the discretion of the Board.)

   b. Applicants must have had adequate undergraduate and graduate education in biology, chemistry, and pharmacology or toxicology. (An example of adequate undergraduate education in chemistry is satisfactory completion of at least 32 semester hours or 48 quarter hours of college level studies in chemistry including accredited courses in inorganic, organic, analytical, and physical chemistry.)

3. Professional Experience (See also Section 5 below)

   a. Applicants must possess at least three (3) years of full-time professional experience (or the part-time equivalent thereof) in forensic toxicology, acceptable to the Board and acquired subsequent to receipt of the doctorate degree, in one or more of the following categories: (1) postdoctoral education/training in toxicology or closely related discipline(s), (2) practice, (3) research, (4) teaching, (5) administration.

   b. At least one (1) year of the professional experience must have been acquired during the five (5) years immediately preceding the date of application.

   c. Applicants are required to document a record of appropriate professional activities in forensic toxicology, in keeping with the concept that "Forensic Toxicology is the study and practice of the application of toxicology to the purposes of the law."

   d. Applicants must be engaged in the practice of forensic toxicology at the time of application for Certification.

4. Examinations

   a. Applicants who meet the requirements in Sections 1, 2, and 3 above will be admitted to comprehensive written examinations based upon broad principles of toxicology, and are required to receive passing grades.

b. Applicants remain eligible to undergo examination within two (2) years after admission to the examination.

c. Applicants who fail in the examination may apply within one (1) year for one (1) re-examination without additional fee.

5. Temporary Waivers

a. For the period ending December 31, 1978, the requirements of an earned doctoral degree and postdoctoral experience are waived for otherwise qualified applicants who possess:

(1) An earned baccalaureate or higher academic degree in one of the natural sciences from an institution acceptable to the Board, and

(2) At least six (6) years of full-time postbaccalaureate experience (or the part-time equivalent thereof) in forensic toxicology, acceptable to the Board, (which) may include graduate education acceptable to the Board).

6. General Provisions

a. The right to deny Certification is reserved.

b. Certificates of Qualification in Forensic Toxicology are valid for five (5) years, and are renewable according to Standards and under conditions established by the Board, at an appropriate fee.

c. Persons holding a valid Certificate of Qualification issued by the Board are entitled to use the designation "Diplomate of the American Board of Forensic Toxicology" and the initials "DABFT" whenever professionally appropriate.

d. Certificates issued by the Board are not transferable. They remain the property of the Board, but every person to whom a Certificate has been properly issued is entitled to its continued possession unless and until such Certificate is revoked.

e. Certificates may be suspended or revoked for appropriate cause, under an elaborate system of safeguards for the diplomate concerned.

- Current Status

During these two years of operation:

- One hundred eighty-five(185) applications have been or are in the process of being reviewed.
- One hundred and ten (110) "Diplomates" have been certified.

The Board continues to receive applications for certification, to review the credentials of the applicants, and to concentrate their efforts toward the creation of a viable continuing education and recertification program.

Odontology

- What is Forensic Odontology?

Forensic Odontology involves the application of dentistry to legal problems. More specifically, the odontologist, often working closely with the forensic pathologist, examines and evaluates injuries to the teeth, jaws and oral tissues and examines dental remains for the purposes of victim identification. He also examines bite marks in cases of homicide, battered children and sexual assault to provide identification of a suspect.

- The American Board of Forensic Odontology, Inc.

The formation of the American Board of Forensic Odontology was approved unanimously at a meeting of the Certification Committee in New London, Connecticut, January 11, 1976. This meeting saw the promulgation of Bylaws, Resolutions, and Articles of Incorporation, under which the Board would function. The Board was incorporated in the District of Columbia on February 4, 1976 and assumed an operational role with the formal approval of the minutes of its first organizational meeting completed on February 7, 1976.

AMERICAN BOARD OF FORENSIC ODONTOLOGY, INC.

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- Certification Requirements

1. General Qualifications

   a. Applicants must be persons of good moral character, high integrity, good repute, and must possess high ethical and professional standing.

   b. Certification is limited to permanent residents of the United States of America, its territories and possessions, or of Canada and its territories.

2. Professional Education

   a. Applicants must possess a dental degree from an accredited institution, conferring the D.D.S. or D.M.D. degree.

   b. Applicants must have specialized training from an institution(s) acceptable to the Board. Such institutions include colleges and universities accredited by Regional Accrediting Commissions recognized by the U.S. Office of Education, and those institutions whose pertinent educational programs have been accredited by one or more national specialized accrediting agencies recognized by the U.S. Office of Education.

3. Professional Experience

   a. Applicants shall have at least two years practical experience in Forensic Odontology, be currently active and formally affiliated with Board accepted

institutions such as: Medical Examiner's or Coroner's Office, Law Enforcement Agency, Insurance Company, Federal Dental Service.

b. Applicants shall participate in twenty-five (25) autopsies attested to by the Medical Examiner or Coroner in charge. This participation will include a dental and oral examination plus a written record of that examination. In combination with or in lieu of the previously mentioned criteria, cases for presentation may also consist of personal injury, malpractice, or peer review.

c. Applicants will submit three (3) significant cases in Forensic Odontology acceptable to the Board, having complete write-ups, photographs, etc., which will become the property of the Board. This requirement shall be subject to waiver by the Board if the applicant is unable to obtain case material.

d. Applicants must be engaged in the practice of Forensic Odontology (consulting practice) at the time the application is submitted. Such experience must be in two (2) or more of the following general categories or appropriate combinations thereof:

1. Post Doctoral Education
2. Training in Forensic Odontology
3. Closely related disciplines
4. Practice
5. Research
6. Teaching
7. Administration

e. Applicants must present evidence of one thousand (1,000) qualification points. The applicant is encouraged not to concentrate in one area, but to be well diversified, determination of such to be at the discretion of the Credentials Committee. It is the responsibility of each applicant to submit documentation and a compilation of his/her own qualifications, to be reviewed by the Credentials Committee. The points are to be accumulated as follows with #7 a must for each applicant:

1. One (1) point per hour for attendance at a Board recognized scientific session (meeting) in Forensic Odontology. A maximum of 100 points.
2. Fifty (50) points for presenting a lecture or a laboratory demonstration at a recognized session.

3. Fifty (50) points for the publication of a paper on forensics (preferably dental) with a reprint or copy to be sent to the Board.
4. Two hundred (200) points maximum for the formal affiliation with a Board recognized institution such as: Medical Examiner, Coroner, Law Enforcement Agency, Federal dental service, or Insurance Company. Twenty-five (25) points for each affiliation.
5. Forty-five (45) points for the organization of a mass disaster team or a symposium. The points divided as follows: twenty-five for directorship, one (1) point per hour for the organizing to a maximum of twenty (20).
6. Twenty-five (25) points for officiary or chairperson of a committee in a Board recognized Forensic Odontology organization.
7. Twenty-five (25) points per case for: a documented routine identification case; a Board recognized procedure such as serology, microscopy, pharmacology, etc.; a bite mark work up. Each case must be documented to the Board.
8. Twenty-five (25) points for a court deposition, a copy to the Board; for a court appearance, including

litigation cases, at the rate of five (5) points per hour with a maximum of twenty-five (25) points per case; twenty-five (25) points for an examination and written report on: malpractice, personal injury, or peer review cases.

9. Two hundred and fifty (250) points maximum for a full time course, as a student, in Forensic Sciences in an institution acceptable to the Board.

4. Examinations

a. Applicants who meet the requirements and qualifications set forth in Sections 1, 2, 3, shall be admitted to comprehensive written and/or oral examinations provided by the Board and based upon broad principles of Forensic Odontology, and shall be required to receive passing grades in such examination(s). Applicants remain eligible to undergo examination for a period of two (2) years after admission to examination.

b. An applicant who fails to pass the examination (s) may apply within one (1) year for re-examination, without payment of an additional fee. After unsuccessful re-examination, an applicant must file a new application and pay an additional fee before examination.

5. General Provisions

a. The right to deny Certification is reserved.

b. Certificates granted and issued by the Board may be suspended or revoked for any of the following reasons:

1. A misstatement or misrepresentation, or concealment or omission of a material fact or facts in an application or any other communication to the Board or its representative(s).

2. Conviction of an applicant for Certification or holder of a Certificate of this Board by a court of competent jurisdiction of a felony or any crime involving, in the judgment of the Board of Directors, moral turpitude.

3. Issuance of a Certificate contrary to or in violation of any of the laws, standards, rules, or regulations governing the Board and its Certification programs at the time of its issuance; or determination that the person Certified was not in fact eligible to receive such Certificate at the time of its issuance.

4. Unethical conduct or other conduct, by a holder of of a Certificate of this Board, which in the judgment of the Board brings the specialty of Forensic Odontology into disrepute.

c. Action to suspend or revoke may only be taken after at least thirty (30) days advance notice of the charges or reasons for such action has been given to the individual concerned and an opportunity for such persons to be heard has been provided by the Board.

d. Applicants who are denied Certification by the Board may appeal such action to the Board of Directors, in writing, within sixty (60) days after the issue date of such notification.

e. Persons holding a valid, unrevoked Certificate of Qualification issued by the Board are entitled to use the designation "Diplomate of the American Board of Forensic Odontology" in conformance with the standards of the American Dental Association.

f. Certificates of Qualification in Forensic Odontology are valid for five (5) years and renewable according to standards and under conditions established by the Board.

g. Certificates issued by the Board are not transferable. They remain the property of the Board, but every person to whom a Certificate has been properly issued shall be entitled to its continued possession unless and until such Certificate is revoked.

- Current Status

During these two years of operation:

- Sixty-five (65) applications have been or are in the process of being reviewed.
- Forty-one (41) "Diplomates" have been certified.

The Board continues to receive applications for certification, to review the credentials of the applicants, and to concentrate their efforts toward the creation of a comprehensive examination and a viable continuing education and recertification program.

Psychiatry

- What is Forensic Psychiatry?

Forensic Psychiatry is a field of practice of the medical specialty of psychiatry in its special medical-legal context. Like other forensic sciences, its goal is to improve the administration of justice. The forensic psychiatrist achieves this objective by providing the legal system with understanding about the relationship of medical and psychological material relevant to legal issues. The forensic psychiatrist promotes this understanding through opinions based

on his investigations, identification, clarification, and interpretation of psychiatric theory and practice, and especially on his meaningfully relating significant clinical data to these issues.

- The American Board of Forensic Psychiatry, Inc.

The formation of the American Board of Forensic Psychiatry was approved unanimously at a meeting of the Certification Committee in San Francisco, California, October 19-20, 1976. This meeting saw the promulgation of Bylaws, Resolutions, Standards and Articles of Incorporation under which the Board would function. The Board was incorporated in the District of Columbia on June 24, 1976 and assumed an operational role with the formal approval of the minutes of its first organizational meeting completed on August 1, 1977.

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- Certification Requirements

1. General Qualifications
   a. Applicants must be persons of good moral character, scientific integrity, with high ethical and professional standing.
   b. Certification is limited to permanent residents of the United States of America, its territories and possessions, or of Canada.
2. Professional Education and Licensure
   a. Applicants must possess an M.D., D.O., or a recognized equivalent medical degree.
   b. Applicants must have a valid license to practice medicine in a state, territory, or province of the United States or Canada.
   c. Applicants must be Certified in Psychiatry by the American Board of Psychiatry and Neurology or by the Canadian equivalent.
3. Professional Experience and Training
   a. Applicants must have a minimum of five years of post-residency experience in clinical psychiatry with substantial experience in forensic psychiatry, including but not limited to, contributions in research, teaching and the administrative aspects of forensic psychiatry.

b. One year of accredited full time training in forensic psychiatry shall be two years of equivalent credit.

c. The applicant must provide evidence of all training in forensic psychiatry. Credit will be considered for forensic psychiatric training within an approved psychiatric residency training program.

d. On approval by the Committee on Credentials the applicant may apply for examination to be conducted by the Committee on Examination at an appointed time and place.

4. Examination

a. Applicants who meet the requirements and qualifications set forth in Sections 1, 2, and 3 above shall be accepted for written examination. Upon successful completion they shall be eligible for an oral examination.

b. Applicants remain eligible to undergo examination within two years after admission to the examination.

c. Applicants who fail in either written or oral examination may apply within one year for one re-examination without payment of additional fee. Before a third examination, an applicant must file a new application and pay an additional fee.

5. General Provisions

a. The right to deny Certification is reserved.

b. Certificates granted and issued by the Board may be denied, suspended or revoked for any of the following reasons:

1. A misstatement, misrepresentation, concealment or omission of a material fact or facts in an application or any other communication to the Board or its representative(s).

2. Issuance of a Certificate contrary to or in violation of any of the laws, standards, rules or regulations governing the Board and its certification programs at the time of its issuance; or determination that the person certified was not in fact eligible to receive such Certificate at the time of its issuance.

3. Conviction of an applicant for certification or holder of a Certificate of this Board by a Court of competent jurisdiction of a felony or any crime involving, in the judgment of the Board of Directors, moral turpitude.

4. Unethical conduct or other conduct by an applicant or holder of a Certificate of this Board, which in the judgment of the Board

brings the specialty of forensic psychiatry into disrepute.

c. Action to suspend or revoke may only be taken after at least thirty (30) days advance notice of the charges or reasons for such action has been given to the individual concerned and an opportunity for such person(s) to be heard has been provided by the Board.

d. Applicants who are denied Certification by the Board may appeal such action to the Board of Directors, in writing, within ninety (90) days after the issue date of such notification.

e. Persons holding a valid unrevoked Certificate of Qualification issued by the Board are entitled to use the designation, "Diplomate of the American Board of Forensic Psychiatry."

f. Certificates issued by the Board are not transferable. Every person to whom a Certificate has been properly issued shall be entitled to its continued possession unless and until such Certificate is revoked.

- Current Status

During these two years of operation:

- One hundred thirty-seven (137) applications have been or are in the process of being reviewed.
- Twenty-nine (29) "Diplomates have been certified.

The Board continues to receive applications for certification, to review the credentials of the applicants, and to concentrate their efforts toward the creation of a comprehensive examination and a viable continuing education and recertification program.

Anthropology

- What is Forensic Anthropology?

The identification of skeletal or otherwise unidentifiable remains is important for both legal and humanitarian reasons. Forensic Anthropology is the application of standard techniques of physical anthropology in making such identifications, and in aiding in the detection of crime. The knowledge of the human skeleton and the ability to reconstruct the biological nature of the living individual from the skeleton, or even from just parts of it, enables the anthropologist to work with recent remains, as well as with prehistoric archeological material. This involves the complex, sophisticated, objective accumulation of physical data acceptable as evidence in a court of law.

- The American Board of Forensic Anthropology, Inc.

The formation of the American Board of Forensic Anthropology was initiated at a meeting of the Certification Committee in Cleveland, Ohio, October 1-2, 1976 where the Articles of Incorporation, Bylaws, and Standards under which the Board would function were provisionally approved. At their first organizational meeting in San Diego, California on February 14, 1977 these documents were officially approved by the

Board along with the election of Directors and Officers. The Board was incorporated in the District of Columbia on January 10, 1977 and assumed operations as a Board with the formal approval of the minutes of its first organizational meeting completed on October 1, 1977.

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- Certification Requirements

1. General Qualifications

   a. Applicants must be persons of good moral character, high integrity, and good repute, and must possess high ethical and professional standing.

   b. Only permanent residents of the United States of America and its territories and possessions, or of Canada and its territories, are eligible for Certification.

2. Education

   a. Applicants must possess an earned Doctoral degree in Anthropology with an emphasis in Physical Anthropology. This would normally include a substantial number of courses in physical anthropology, osteology, anatomy, or forensic anthropology. The Doctoral degree must be from a credited institution recognized by the Board. Normally the Doctoral degree will be a Ph.D. in Anthropology from a recognized Department of Anthropology in an accredited University.

3. Professional Experience

   a. Applicants must possess at least three years of full-time professional experience which involved all or in part the practice of forensic anthropology. This experience must be acceptable to the Board

and acquired subsequent to the receipt of the Doctoral degree. Such experience may include (1) Post-Doctoral training in forensic anthropology or a closely related discipline, (2) the practice of forensic anthropology, (3) research in one or more areas of forensic anthropology or (4) the teaching of courses in forensic anthropology or osteology.

b. At least one year of the professional experience must have been acquired during the last five years immediately preceding the date of application.

c. Applicants are required to document a record of appropriate professional activities in forensic anthropology, in keeping with the concept that "Forensic Anthropology is the study and practice of the application of the methods of physical anthropology to the process of the law."

4. Examinations

a. Applicants who meet the requirements in sections 1, 2 and 3 above will be admitted to comprehensive, written and practical examinations based upon broad principles of forensic anthropology and are required to achieve passing grades.

b. Applicants remain eligible to undergo examination within two years after admission to the examination.

c. Applicants who fail in the examination may apply within one year for one (1) re-examination, without additional fee.

5. Temporary Waivers

a. For the period ending June 30, 1978 certain requirements may be waived for those applicants who, in the opinion of the Board, are clearly competent in and have made significant contributions to the field of forensic anthropology. During this period certification will be based upon the acceptance of submitted credentials for those applicants deemed clearly qualified by all members of the American Board of Forensic Anthropology. Minimum requirements for such certification would include a Doctoral degree with appropriate training and experience in forensic anthropology.

b. For those applicants that are not deemed qualified by the Board at the time their applications are reviewed, comprehensive, written and practical examinations may be offered to establish their competence.

c. After July 1, 1978 all applicants will be required to take written and practical comprehensive examinations as a part of the requirements for Board Certification.

6. General Provisions

   a. The right to deny Certification is reserved.

   b. Certificates of Qualification in Forensic Anthropology are valid for three (3) years, and are renewable according to Standards and under conditions established by the Board, at an appropriate fee.

   c. Persons holding a valid Certificate of Qualification issued by the Board are entitled to use the designation "Diplomate of the American Board of Forensic Anthropology" and the initials "DABFA" whenever professionally appropriate.

   d. Certificates issued by the Board are not transferable. They remain the property of the Board, but every person to whom a Certificate has been properly issued is entitled to its continued possession unless and until such Certificate is revoked.

- Current Status

During these two years of operation:

- Twenty-nine (29) applications have been or are in the process of being reviewed.
- Twenty-two (22) "Diplomates have been certified.

The Board continues to receive applications for certification, to review the credentials of the applicants, and to concentrate their efforts toward the creation of a comprehensive

examination and a viable continuing education and recertification program.

Document Examiners

- What is Forensic Document Examination?

Forensic Document Examination involves the scientific examination of handwriting, typewriting, printing, ink, paper, or any other aspect of a document for the purpose of determining various legal questions asked about documents. These questions could involve identifying the writer of a document, determining if a signature is authentic or is a forgery, determining the age of a document, deciphering obliterated or erased writings, or a host of other questions that might be raised in civil or criminal trials. The Forensic Document specialist relies on his carefully honed judgment and experience, his comprehensive reference files, and a variety of scientific tools to make his determinations. The scientific tools range from simply magnifying glasses to sophisticated instrumentation, such as recording spectrophotometers and x-ray fluorescence spectrometers.

- The American Board of Forensic Document Examiners, Inc.

The formation of the American Board of Forensic Document Examiners was approved unanimously at a meeting of the Certification Committee in Arlington, Virginia, March 25-27, 1977. The Board was incorporated in the District of Columbia on January 10, 1977, and assumed an operational role with the formal approval of the minutes of its first organizational meeting completed on December 2, 1977.

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- Certification Requirements

1. General Qualifications

   a. Applicants must be persons of good moral character, high integrity, good repute and must possess high ethical and professional standing.

   b. Certification is limited to permanent residents of the United States of America, its territories and possessions, or of Canada or Mexico.

2. Educational Qualifications

   Applicants (for certification) must possess an earned baccalaureate degree from an institution acceptable to the Board. (Acceptable institutions are those accredited by Regional Accrediting Commissions recognized by the U.S. Office of Education, and other institutions in the discretion of the Board.)

3. Professional Experience Qualifications

   a. Applicants are required to document a full-time two-year training period in a Forensic Document Laboratory recognized by the Board.

   b. Applicants must be able to demonstrate that they have completed two (2) years of full-time independent document work in a Forensic Document Laboratory recognized by the Board. (If all other requirements have been met the examination referred to in Section 4(a) below may be taken before this

requirement is completed, but no certificate will be issued until this requirement is met.)

c. Applicants will be required to submit as references the names and addresses of three (3) Forensic Document Examiners recognized by the Board attesting to his/her qualifications for certification and high ethical character. Current Board members cannot be used as references. (References from persons other than Document Examiners will be evaluated on an individual basis.)

e. Each applicant shall be required to demonstrate a record of appropriate professional activities in forensic document examination in keeping with the following definitions:

1. "Forensic document examination is the practice of the application of document examination to the purposes of the law."
2. "Forensic document examination relates to the identification of handwriting, typewriting, the authenticity of signatures, alterations in documents, the significance of inks and papers, photocopying processes, writing instruments, sequence of writings and other elements of a document in relation to its authenticity or spuriousness."

4. Examinations

   a. In addition to meeting the requirements in Sections 1, 2, and 3 above applicants shall be required to take a comprehensive written and/or oral examination based upon the broad range of problems frequently encountered in document examination and achieve passing grades. These problems may include questions concerning the authorship of handwriting, the authenticity or spuriousness of a signature, the source of typewritten material, the presence or absence of alterations, additions or deletions on documents, the comparison of inks, papers and writing instruments, or similar questions as promulgated by the Board.

   b. Applicants are eligible to undergo examination for two (2) years after approval of their applications.

   c. An applicant who fails to pass the examination(s) may apply after one (1) year for reexamination by payment of a nominal fee established by the Board.

5. Temporary Waivers

   a. For the period ending June 30, 1979, the requirements of an earned baccalaureate degree described in Section 2 and the formal training described in

Section 3(a) are waived for otherwise qualified applicants (on a year-for-year basis) who can document professional full-time experience in forensic document examination in a situation acceptable to the Board. Such experience shall be in addition to the requirements noted in Section 3(b) above.

b. For the period ending June 30, 1979, the written and/or oral examination(s) will be waived for applicants who, in the judgment of the Board meet the requirements noted in Section 5(a). The qualifications of those who desire to apply under this waiver will be reviewed by the Board to ascertain the diversity of work of which the applicant is capable and to establish his professional ability.

6. General Provisions

a. The right to deny certification is reserved by the Board.

b. Certificates of Qualification in Forensic Document Examination are valid for five (5) years and are renewable according to standards and under conditions established by the Board, at an appropriate fee.

c. Persons holding a valid Certificate of Qualification issued by the Board are entitled to use the designation "Diplomate of the American Board of Forensic Document Examiners."

d. Certificates issued by the Board are not transferable. They remain the property of the Board, but every person to whom a Certificate has been properly issued is entitled to its continued possession unless and until such Certificate is revoked.

e. Certificates may be suspended or revoked for cause under an appropriate system of safeguards for the Diplomate concerned.

- Current Status

During these two years of operation:

- One hundred and twelve (112) applications have been or are in the process of being reviewed.
- Fifty-seven (57) "Diplomates" have been certified.

The Board continues to receive applications for certification, to review the credentials of the applicants, and to concentrate their efforts toward the creation of a comprehensive continuing education and recertification program.

Criminalistics

- What is Criminalistics?

Criminalistics is that profession and scientific discipline directed to the recognition, identification, individualization and evaluation of physical evidence by the application of the natural sciences to law-science matters.

- The Criminalistics Certification Study Committee

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(206) 464-7075

This committee has representatives from the following principal forensic organizations:

- AMERICAN ACADEMY OF FORENSIC SCIENCES
- AMERICAN SOCIETY OF CRIME LABORATORY DIRECTORS
- ASSOCIATION OF FIREARMS AND TOOLMARKS EXAMINERS
- CALIFORNIA ASSOCIATION OF CRIMINALISTS

- CANADIAN FORENSIC SCIENCE SOCIETY
- MID-ATLANTIC ASSOCIATION OF FORENSIC SCIENTISTS
- MIDWESTERN ASSOCIATION OF FORENSIC SCIENTISTS
- NORTHEASTERN ASSOCIATION OF FORENSIC SCIENTISTS
- NORTHWEST ASSOCIATION OF FORENSIC SCIENTISTS
- SOUTHERN ASSOCIATION OF FORENSIC SCIENTISTS

In addition, representatives from the Alcohol, Tobacco and Firearms Forensic Laboratory, the Drug Enforcement Administration Forensic Laboratory and the Federal Bureau of Investigation Laboratory also sit on the Committee.

- Potential Benefits of a National Program of Certification in Criminalistics

NEED

A lack of adequate education and training facilities has led to on-the-job training as the major means of acquiring the necessary skills for professionals in criminalistics. Unfortunately, very high case loads, lack of trained personnel and other pressures have lowered the effectiveness of such training efforts. As a result in-house and other proficiency testing programs have increasingly revealed a need for some means of improving the training of professionals in all of the diverse fields of criminalistics. A national program of certification seems to hold the greatest promise for:

1. defining an acceptable level of professional practice;

2. pin-pointing the need for training;

3. guiding the training effort;

4. monitoring individual progress;

5. recognizing the abilities of qualified personnel.

DEFINITION

Certification is defined as a voluntary process of peer-review whereby a practitioner is recognized as having accumulated the minimum qualifications necessary to practice in one or more particular disciplines of criminalistics. The objectives of certification are:

1. to define an acceptable level of professional practice;

2. to guide professionals in the attainment and maintenance of an accepted level of competence;

3. to provide a means of evaluating the competence of practitioners;

4. to provide a formal process for the recognition of practitioners who have met an accepted level of competence.

Criminalistics is that profession and scientific discipline directed to the recognition, identification, individualization and evaluation of physical evidence by the application of the natural sciences to law-science matters.

BENEFITS

The Criminalistics Certification Study Committee, representing the major professional organizations within the field of criminalistics, drew up the following list of potential benefits for a certification

program during its April 27-28, 1977 meeting in Chicago. This list will aid in the setting of goals and objectives of national program for certification should be deemed acceptable and feasible by a majority of the practitioners in the field of criminalistics. The benefits of a voluntary peer-group national certification program are both direct and indirect, short and long-term, practical and philosophical. In an overall sense the benefits of the program can be expressed as:

1. improvement in the administration and quality of civil and criminal justice;
2. progress toward nation-wide equality of performance in the examination, analysis and interpretation of physical evidence.

These are further benefits for the active professional:

3. increased availability of training and educational opportunities;
4. setting of goals for professional development;
5. definition of limits in capabilities of personnel and laboratories;
6. improved methods for the collection, study, characterization, identification and comparison of physical evidence;
7. increased proficiency in the application of the above methods;
8. defining an acceptable level of professional competence;
9. recognition of individual attainment of professional competence;
10. assure that certification is carried out by peer-group evaluation in each of the diverse disciplines of criminalistics;
11. improved qualification for, and confidence in, court appearances;
12. enhanced recognition of criminalistics as a profession.

The laboratory administrator will benefit from the greater proficiency of his personnel but other tangible benefits include:

13. pin-pointing areas of need, both in equipment and personnel capability;

14. aid in justification of funding for training, equipment, increased salaries and filling positions;

15. assure the administrator that certification is done by active practitioners in criminalistics.

Finally there will be benefits to the educational and training system and to the Judiciary:

16. guidance in the planning and implementing of educational and training programs adequate both in number and scope;

17. improved understanding by the legal profession, the judiciary and the public of the capabilities and limitations of expert witnesses in the field of criminalistics.

- Interim Report of Criminalistics Certification Study Group

November 1977

1. FINDING

Representatives of the regional/professional associations represented on the Committee communicated and exchanged information with one another prior to the completion of questionnaires which were mailed to their respective memberships, following the April 1977 meeting.

DISCUSSION

In the interests of gathering comparable information on the relevant feelings of the total criminalistics community regarding certification, an attempt was made to coordinate as much of the information

sought as possible. The various regional association representatives did not feel that a completely uniform national questionnaire was practical at that time because of the varying levels of certification study in the different regions up to that time.

Committees to assist in the investigation of certification have been established or are in the process of being established in each regional association and AFTE.

At the third meeting of the Criminalistics Certification Study Group held at the Chicago Police Department, Criminalistics Division on September 30 - October 1, 1977 the respective questionnaire findings were critically examined and compared.

2. FINDING

The majority of the individuals polled by all of the above regional groups and AFTE agree with the concept of national, voluntary, peer group certification.

DISCUSSION

Over 600 members of the above associations responded to the respective questionnaires. Of those responding approximately 78% were in agreement with the above finding. The favorable vote by the associations ranged from a low of 65% for the concept to a high of 93%.

3. FINDING

The overwhelming majority of the members of the organizations polled felt that the Criminalistics Certification Study Group should continue to study the feasibility and desirability of certification.

DISCUSSION

Approximately 88% of those responding favored the composition and continuance of the study group. The favorable responses to the respective questionnaires ranged from a low of 67% to a high of 98%.

4. FINDING

The majority of the individuals polled were in favor of their associations' continuing to be represented on the study group to insure input and dissemination of information.

DISCUSSION

Associations which included such a question on their questionnaire found that the membership favored representation on the study group even if it meant their own association would have to provide travel funds to send their representatives to meetings of the group.

5. FINDING

Gauging by the results of the regional association questionnaires, the study committee determined that it was unnecessary at this time to issue a national questionnaire.

DISCUSSION

In the interest of avoiding repetitive, time consuming (for those answering) questionnaires, it was decided the committee had gathered sufficient information for this stage of the study.

All committee members plan to meet with their respective memberships in internal committees both to inform them of progress made by the study committee and to solicit additional study input.

6. FINDING

Data from the questionnaires indicated there was no possible agreement on how to group types of physical evidence examinations by disciplines, therefore the most practical approach at this time is not to group by specialties (disciplines) but rather to certify by type of physical evidence examinations.

DISCUSSION

Data show it is difficult to assign specific examinations to a specific discipline or specialty; therefore, it was much more practical to utilize the types of physical evidence examinations, e.g., one questionnaire showed that semen examinations were conducted by a firearms specialist in the laboratory. There were many less extreme examples of an incongruous nature in other specialties. The disciplines are not clearly delineated.

7. FINDING

There is agreement that all examiners should possess the same minimum qualifications for each type of physical evidence examination.

DISCUSSION

Approximately 76% of respondents queried supported the proposition that all individuals engaged in the examination of specific physical evidence types should possess the same minimum qualifications. Therefore both "generalists" and "specialists" engaged in the examination of a type of physical evidence for the same property would be expected to meet the same minimum standards.

8. FINDING

If the concept of national voluntary peer group certification is found to be feasible and desirable for the purposes of initiating a criminalistics certification program it will probably be necessary to "grandparent" qualified individuals with the condition that these persons be required to pass an examination within a specified (three years) period of time.

DISCUSSION

Associations which included one or more questions on the subject found that "grandfathering" based on some combination of experience, education, publications, reputation, and contributions to forensic science was acceptable when followed by those persons being required to pass the same examination as other non-grandparented individuals by a specified date. The vote of those responding

favorably was 71 - 77%.

9. FINDING

The Certification Study Group is supportive of and wishes to maintain liaison with the American Society of Crime Laboratory Directors (ASCLD) voluntary peer group laboratory accreditation study committee (Laboratory Evaluation and Standards Committee).

DISCUSSION

The laboratory accreditation study is related to the certification study. It is considered that both efforts are complementary and probably desirable in the public interest if found to be feasible and acceptable.

- Examination Procedures

At its December 1977 meeting, the CCSC drafted guidelines for the examination of candidates in various testing categories:

a. Each regional group, association, laboratory system, or otherwise unrepresented person in all areas of the nationwide criminalistics community will be invited to submit nominees for positions on the peer group examination boards by categories. Each peer group examination board will be responsible for the content of the examination in that category. They will also conduct the examinations. The mechanisms for selecting and pre-screening the nominees will be determined by the regional group, association,

laboratory, or unrepresented person making the nomination. Each nomination must be accompanied by an application and a structured resume starting the nominee's willingness to serve, background, and qualifications (education, experience, publications, etc.).

b. The CCSC (or its equivalent successor) consisting of representatives selected from each regional organization and professional group will select the members of the peer examination boards from the lists of nominees in each category. These selections will be based on qualifications of the nominees and such points as geographic representations, etc. The persons selected will probably not be "expert's experts". Instead, they will be the recognized competent peers of the persons who would be certified. An attempt will be made to obtain a base of representation as broad as possible on each examination board. The examination boards will be subjected to review and approval of the criminalistics community on a national basis before they become final.

It will be up to each examination board to determine exactly what type of test will be given in each category. The CCSC (or its equivalent successor) consisting of representatives selected from each regional organization and professional group will establish general outlines for the tests. The latter will also make policy decisions regarding certification matters on a national basis.

The CCSC was in general agreement that the modes of testing which should be explored for feasibility are as follows:

a. Written Examination: The process would require a structured resume of the background, education, and experience of the applicant. The examination would contain objective questions on specific subject matter for that category. It could also include some questions fundamental to all categories of criminalistics. Further certification testing of the applicant would be contingent upon passing the written examination.

b. Proficiency Testing: This would consist of an analysis and written report by the applicant on simulated case evidence materials.

c. Written or Oral Presentation of Proficiency Test Results: This will include in-depth examination of the methodology used, comparison standards, explanation of potential interferences, reasons for the selection of the methods, etc. Although somewhat subjective, the test will be given following fixed national guidelines by trained peer examiners.

LIST OF SKILLS COMMON TO PRACTITIONERS IN THE FIELD OF CRIMINALISTICS

These are areas of knowledge and/or skills that are required for all practitioners in the field of criminalistics regardless of their expertise. Each peer group examination board shall incorporate each

of these areas of knowledge and/or skills into their testing procedures, at a level that is appropriate for each type of evidence examined.

I. Basic Principles of Identification and Individualization

A thorough understanding of the principles of identification to include:

a. The stages of the identification process: analysis, comparison and evaluation.

b. The related concepts of class and individual characteristics.

c. The necessity for background information and reference standards as they pertain to individualization.

d. The degree of specificty of analytical data.

e. Basic statistical concepts such as rules of probability.

II. Scientific Methodology

An understanding of scientific methodology of controlled experimentation and basic analytical concepts of measurement theory such as accuracy, precision, reliability, confidence limits, etc. A familiarity with problem solving processes including the basics of research design and methodology.

III. Evidence Handling

Demonstrated skill in the proper collection and handling of physical evidence including marking, labelling, packaging of various types of physical evidence, maintenance of custody

records and an understanding of the legal requirements for the authentication of evidence for court purposes. An understanding of the proper handling of evidence in the laboratory for examination by other sections.

IV. Basic Microscopy

The microscope is a basic tool for most forensic examinations. Everyone in the field of criminalistics must understand the use of the microscope to the degree required for his or her area of expertise.

V. Communication

Basic ability or skill in clear and concise communication. This would involve the ability to express a concept or a result in both writing and speech, as demonstrated in the examination process.

VI. Legal Aspects and Court Testimony

Basic knowledge of courtroom procedures and the role of the expert witness. An understanding of the acceptability of physical evidence in judicial procedings.

VII. Literature of Criminalistics

Familiarity with the literature of the forensic sciences with special emphasis on the developmental aspects pertinent to his/her own area of evidence category.

VIII. General Knowledge of Criminalistics

A general knowledge of the capabilities of each discipline and subdiscipline within the criminalistics area. The practitioner should know the types of examinations that should be performed on the item(s) of evidence to obtain the most useful information in a given investigation. The ability to evaluate the significance of a particular item(s) of evidence in relation to the investigation.

- Certification Evidence Categories

The roman numerals in the left column represent the separate categories in which persons could be certified. The letters A, B, C, and D in the right column represent the four peer groups that can possibly handle those categories indicated by the brackets. This list, less tentative but still not fixed, follows:

	Evidence Categories	Peer Groups
I.	Firearms Examination A. Operability of Firearms B. Bullet and Cartridge Case C. Powder and Shot Pattern (Distance Determination) D. Weapon Determination from Discharged Case and/or Bullet	A
II.	Serial Number Restoration	
III.	Toolmarks	

	Evidence Categories	Peer Groups
IV.	Blood	
	A. Preliminary Examination, Confirmation of Species Origin and Antigen-Antibody Identification	
	B. Polymorphic Protein Characterization	
V.	Other Physiological Fluids - Examined by Serological Techniques (e.g., Semen, Saliva, Feces, etc.)	B
	A. Identification as the Basic Biological Substance by Chemical Tests and Other Examinations	
	B. Genetic Marker Characterization	
VI.	Toxicology - Qualitative and Quantitative Analysis and Interpretation - NOT to Include Cause of Death in Humans	
	A. Blood/Alcohol - (Blood, Urine, Breath)	
	B. Poisons	
	C. Drug Screening from Blood and Urine	C
VII.	Controlled Drugs Other Than Marihuana	
VIII.	Marihuana	
IX.	Arson Materials	
X.	Explosives and Their Residues	
XI.	Hair	D
	A. Characterization - Animal and Human	

	Evidence Categories	Peer Groups
XII	Natural and Synthetic Fibers - Fabrics Included	
XIII.	Paint	
XIV.	Glass	D
XV.	Soils	
XVI.	Gunshot Residue - Found on Hands	

- Surveys of the Criminalistics Community

During the second year grant of the Certification Project, the CCSC undertook surveys of the criminalistics community for the purpose of assessing:

1) The state-of-the-art, that is, what is presently being done nationwide in the discipline of criminalistics;

2) What techniques the criminalistics community feels should be included in a possible certification testing program.; and

3) The background and qualifications of practicing criminalists.

Five (5) questionnaires were designed, tested and administered to the crime laboratory community. The first two (2) questionnaires were directed toward the directors of laboratories and the latter three (3) were aimed at practicing specialists in the areas of forensic serology, hairs and fibers examinations and drug chemistry.

Results from the questionnaires are presently being analyzed and reviewed by members of the CCSC and will also be utilized by various peer groups in the establishment of minimum standards and examination areas. See Appendix #1 for questionnaires (four forms).

- Peer Groups

Under the general direction of the CCSC, various peer groups are now forming in criminalistics specialty areas. The initial peer group on firearms and toolmark identification met in Chicago, Illinois October 7-9, 1978. This committee adopted objectives similar to and consistent with the goals of the CCSC. They are:

1. Determine the type and scope of examinations to be certified.
2. Determine the minimum qualifications required to be considered for certification: a) moral and ethical standing in the community; b) education; and c) experience.
3. Determine type of testing to be given: a) written exam; b) practical tests; and c) oral exam.
4. Determine the logistics of conducting and administering the certification program to be adopted.

This peer group is actively working toward finalization of standards and procedures and hopes to be able to present its certification package to the firearms community and to the CCSC by May 1979.

The third year certification grant contains provisions for support of this group and two additional peer groups in the coming year: serology and drug chemistry.

- Schedule for 1979

The CCSC timetable for 1979 follows:

Group	Date	Agenda
CCSC meeting	February 10-11	Choose peer group, by-laws, reports on questionnaires, etc.
Peer group meetings	About March 15	Standards for certification, requirements for recertification, testing mechanism and form of examination, grandfathering.
Peer group meetings	About June 1	Continuing discussions and preparation of final package for CCSC.
Peer groups	July 15	Submission of final package to CCSC.
CCSC meeting	About August 1	Go over the peer-group final package and prepare CCSC final package for criminalistics community.
CCSC	About August 20	CCSC package ready to mail to criminalistics community.
All regional associations	Sept.-Oct.	Package presented to all regional groups.
National criminalistics community	About Nov. 1	Balloting takes place.
CCSC meeting	February 19-20, 1980	Final meeting and discussion of results.
ABC?	To follow meeting scheduled above	First organizational meeting of the American Board of Criminalistics?

FINANCIAL STATUS REPORT (H-1)

No further monies or other benefits may be paid out under this program unless this report is completed and filed as required by existing law and regulations (34 CFR 256)

1. Federal Agency and Organizational Element: U.S. Department of Justice, LEAA

2. Federal Grant No. or Other Ident. No.: #77NI-99-[redacted]70

3. Name and Address of Grantee Organization:
Forensic Sciences Foundation, Inc.
11400 Rockville Pike, Suite 515
Rockville, Maryland 20852

4. Employer Identification No.: 237050691

5. Grantee Acct. No. or Ident. No.: N/A

6. Final Report: [X] Yes (Complete 12b(3) below) [ ] No

7. Basis of Report: [ ] Cash [X] Accrued Expenditures

8. Project Period (Mo., Day, Yr.): FROM 10 | 3 | 77 TO 4 | 2 | 79

9. Report Period (Mo., Day, Yr.): FROM 4 | 1 | 79 TO 4 | 2 | 79

10. STATUS OF FUNDS

	PROGRAMS – FUNCTIONS – ACTIVITIES (1)	(2)	(3)	(4)	(5)	(6)	TOTAL
a. Total outlays previously reported (Line 10e from previous rept.)							$ 171,836
b. Tot. program outlays this period							453
c. Less: Program income credits							-0-
d. Net program outlays this period (Line b minus Line c)							453
e. Tot. program outlays to date (Sum of Lines a and d)							172,289
f. Less: Non-Federal share of program outlays		CORRECTED COPY #3					453
g. Tot. Federal share of program outlays (Line e minus Line f)							171,836
h. Total unpaid obligations							-0-
i. Less: Non-Federal share of unpaid obligations							-0-
j. Fed. share of unpaid obligations (Line h minus Line i)							-0-
k. Tot. Fed. share of outlays and unpaid obligations (Line g plus line j)							171,836
l. Tot. Fed. funds authorized							171,836
m. Unobligated balance of Fed. funds (line l minus line k)							-0-

11. Indirect Expense: a. Type of rate (Mark box) [X] Provisional [ ] Predetermined [ ] Final [ ] Fixed

b. Rate: 60%

c. Base: 0

d. Total Amount: 0

e. Federal Share: 0

12. REMARKS (Attach additional sheets if necessary) See Instructions on Reverse.

12a. Planning Grants
(1) Consultant Services $
(2) Pass Through $

12b(1). Block Action Grants
Part C $ Pass Through $
Part E $ Pass Through $
JJDP $ Pass Through $

13. CERTIFICATION – I certify that to the best of my knowledge and belief, this report is correct and complete and that all outlays and unpaid obligations are for the purposes set forth in the grant award documents.

Name and Title: Robert D. Albro, Act. Exec. Dir

TELEPHONE: Area Code 301 Number 770-2723 Ext.

Signature of Authorized Official

Date Rept. Is Submitted: Aug. 1, 1979

12b(2). Buy-In $

12b(3). Block-Final H-1 Rept. Pt. C. Total Personnel $

12c. Categorical Grants Pt. C. Total Personnel $

LEAA Form 7160/1 (Rev. 10/77) Replaces edition of 6-76 which is obsolete.

Copy 4: Information

INSTRUCTIONS FOR PREPARING THE FINANCIAL STATUS REPORT

Item 1 — Enter the name of the cognizant LEAA Central Office.

Item 2 — Enter the Federal grant number.

Item 3 — Enter the name and complete mailing address including the Zip code for the SPA or other grantee organization.

Item 4 — Enter the employer identification number assigned by the U.S. Internal Revenue Service.

Item 5 — Enter "NA" for not applicable.

Items 6 and 7 — Mark the appropriate block.

Item 8 — Enter the month, day, and year of the beginning and ending period of the grant. The ending period should reflect any approved extension date.

Item 9 — Enter the month, day, and year of the beginning and ending dates of the quarter for which this report is prepared.

Item 10

Line a. Enter the total outlays reported on Line 10e of the previous report. Show zero, if this is the initial report for the grant.

Line b. Enter the total gross program outlays for this report period, including disbursements of cash realized as program income. For reports which are prepared on a cash basis, outlays are the sum of the subgrantees actual cash disbursements for goods and services, the amount of indirect expense charged, the value of in-kind contributions applied, and the amount of cash advances and payments made to contractors. For reports prepared on an accrued expenditure basis, outlays are the sum of the subgrantees actual cash disbursements, the amount of indirect expense incurred, the value of in-kind contributions applied, and the net increase (or decrease) in the amounts owed by the subgrantee for goods and other property received and for services performed by employees, contractors, and other payees. Outlays for Planning Grants include both the outlays made by the SPA for its own operation and outlays reported by the subgrantees.

Line c. The report prepared on a cash basis, enter the amount of cash income received during the quarter which is to be used in the project or program in accordance with the terms of the grant. For reports prepared on an accrual basis, enter the amount of the net increase (or decrease) in the amount of accrued income since the beginning of the report period.

Line d. This amount should be the difference between amounts shown on Lines b and c.

Line e. Enter the sum of amounts shown on Lines a and d above. This amount represents the cumulative outlays to date of both Federal and non-Federal funds.

Line f. Enter the cumulative non-Federal share ("Match") of the program outlays included in the amount of Line e.

Line g. Enter the cumulative Federal share of program outlays. The amount should be the difference between Lines e and f.

Line h. For reports prepared on a cash basis, enter the total amount of unpaid obligations for this grant. Unpaid obligations for Planning Grants consist of unpaid obligations of the SPA for its own operation plus unpaid obligations reported by the subgrantees. For reports prepared on an accrued expenditure basis, enter the amount of undelivered orders and other oustanding obligations. Do not include any amounts that have been included on Lines a through g. On the final report, Line h should have a zero balance.

Line i. Enter the non-Federal share of unpaid obligations included on Line h. On the final report, Line i should have a zero balance.

Line j. Enter the Federal share of unpaid obligations included on Line h. The amount shown on this line should be the difference between the amounts on Lines h and i. On the final reports, Line j should have a zero balance.

Line k. Enter the sum of the amounts shown on Lines g and j. If the report is final, the report should not contain any unpaid obligations.

Line l. Enter the total amount of the Federal grant.

Line m. Enter the unobligated balance of Federal funds. This amount should be the difference between Lines l and k.

Item 11 — INDIRECT EXPENSE

a. Type of rate — Mark appropriate block.

b. Rate — Enter the rate in effect during the quarter.

c. Base — Enter the amount of the base to which the rate was applied.

d. Total Amount — Enter the total amount of indirect cost charged during the quarter.

e. Federal Share — Enter the amount of the Federal share charged during the report period.

(When reporting on Planning or Block Action Grants, complete only items d and e. Enter "NA" for items a through c.)

If more than one rate was applied during the project period, include a separate schedule which shows the basis against which the indirect cost rates were applied, the respective indirect rates, the month, day, and year the indirect rates were in effect, amounts of indirect expense charged to the project, and the Federal share of indirect expense charged to the project to date. (See Federal Management Circular 74-4 which contains principles for determining allowable costs of grants and contracts with State and local governments.)

Item 12 — Provide the following information, if applicable:

a. Planning Grants

(1) Consultant services — the amount included in Line k for consultant services.

(2) Pass-through — the cumulative amount of awards to subgrantees.

b. Block Action Grants — Parts C, E, and JJDP

(1) Pass-through — the cumulative amount of Federal funds subgranted to local units of government. This amount should include subgrants to units of state government for the benefit of local units of government when such a waiver has been granted.

(2) Buy-in — the cumulative amount of State funds provided to local units of government to be used as part of the grantee contribution.

(3) One-third Personnel Limitation — the cumulative amount of Federal funds outlayed for compensation of police and other regular law enforcement personnel. This is only required to be shown on the final H-1 report.

c. Categorical Grants — Part C

One-third Personnel Limitation — the cumulative amount of Federal funds outlayed for compensation of police and other regular law enforcement personnel.

Item 13 — The contents of this item are self-explanatory.

ADDITIONAL INFORMATION

A. One form 7160/1 required for each grant award.

B. All credit figures will be shown in parenthesis ( ).

C. Due Date: Quarterly, within 45 days after the end of quarter. Final reports are due 90 days after end of grant period or after completion.

D. Distribution: Original, yellow and pink copies to:
U.S. Department of Justice, LEAA
Office of the Comptroller - Control Desk
Washington, D.C. 20531

Green copy to be retained by SPA or other grantee.
Salmon copy (Information Copy)

The Forensic Sciences Foundation, Inc.
11400 ROCKVILLE PIKE
ROCKVILLE, MARYLAND 20852
(301) 770-2723

QUESTIONNAIRE NUMBER 1

WHICH EVIDENCE CATEGORIES ARE EXAMINED BY INDIVIDUAL CRIMINALISTS?

The Criminalistics Certification Study Committee (CCSC) is taking this poll of crime laboratory directors to help the CCSC decide how the various evidence categories might best be grouped for possible certification purposes. We hope you can take a few minutes and help us by noting which of the following categories are handled in your laboratory by the same individual.

Your answers will help the CCSC decide how evidence categories are best grouped, the degree of specialization of criminalists and how best to plan certification examinations should this step be indicated.

Please start with the first evidence category examined in your laboratory and place an "A" representing one individual or group of individuals. (Please see the attached Evidence Categories Listing for additional detail on the major evidence categories.) Put "A" opposite each category performed by that same individual or group of individuals. "A" may be placed under either professional (an examiner whose work may lead to court testimony) or technicians (who do work on cases but do not testify in court). Next, place a "B" opposite those categories performed by a second individual or group. Continue with "C", "D" . . . until all criminalists (examiners) in your laboratory have been assigned. A blank opposite any category indicates you do not handle that evidence category. All unlisted evidence categories examined in your laboratory can be added at the bottom under "Other _____". We have included only the 16 evidence categories where we anticipate certification will be carried out initially.

The example shown is for a representative 8-person laboratory and may assist you in understanding how we would like your data recorded.

QUESTIONNAIRE NUMBER 2

ANALYTICAL TOOLS

The CCSC needs additional information on the analytical tools used by crime laboratory personnel in characterizing, identifying or comparing the various types of evidence. We would appreciate your assistance in filling in the second questionnaire by placing an "x" in each box where a particular analytical technique is used to examine an evidence category.

Please return both questionnaires to the Foundation in the enclosed postage-paid envelope.

Both questionnaires are ANONYMOUS so do not place your name or other identifiers on them.

QUESTIONNAIRE NUMBER 1

EVIDENCE CATEGORY	INDIVIDUALS (OR GROUPS)			
	Your Lab		Example	
	Professional	Technician	Prof.	Tech.
Firearms Examination			---	---
Serial Number Restoration			A	
Toolmarks			A	
Blood			---	---
Other Body-Fluids			---	---
Toxicology			B	
Controlled Substances			B,C,D	
Marihuana			B,C,D	
Hair Comparison, Human			D,E,F	
Hair Species, Human of Fur			D,E,F	
Fibers			D,E,F	
Paint			D,E,F	
Glass			D,E,F	
Soils			D,E,F	
Arson			G	
Explosives			D	
Gunshot Residue (on hands)			H	
Other: inks			D	
pencil			D	
explosions			G	
_____				
_____				
_____				
_____				
_____				
_____				
_____				

How many professional examiners are employed in your laboratory in these evidence categories? _____

* Please return this questionnaire to:

The Forensic Sciences Foundation, Inc.
11400 Rockville Pike, Suite 515
Rockville, Maryland 20852

QUESTIONNAIRE NUMBER 2

ANALYTICAL TOOLS

Evidence Category \ Analytical Tool	Stereo microscopes	Comparison 'scopes	Phase 'scopes	Polarizing 'scopes	Dispersion staining	Microcrystal tests	Hot stage	Monochromator	TLC	HPLC	GC	GC/MS	Emission spectroscopy	IR absorption	UV & Vis absorption	Atomic absorption	Spectrofluorimetry	Scintillation counter	Neutron activation	SEM	SEM/EDXRA	X-ray diffraction	X-ray fluorescence	Electrophoresis	Other			
Firearms																												
Serial numbers																												
Tool-marks																												
Blood: basic presumptive, confirmatory																												
Blood: ABO, RH etc., grouping																												
Blood: serum protein, isoenzymes																												
Other body fluids																												
Toxicology																												
Controlled substances																												
Marihuana																												
Hair																												
Fibers																												
Paint																												
Glass																												
Soils																												
Arson																												
Explosives																												
Gunshot residue, hands																												
Other:																												

CRIMINALISTICS CERTIFICATION EVIDENCE CATEGORIES

I. Firearms Examination

- A. Operability of firearms
- B. Bullet and cartridge case comparison
- C. Powder and shot pattern (distance determination)
- D. Weapon determination from discharged case and/or bullet

II. Serial Number Restoration

III. Toolmarks

IV. Blood

- A. Preliminary examination, confirmation of species origin and antigen-antibody identification
- B. Polymorphic protein characterization

V. Other Physiological Fluids - Serological Techniques (e.g., Semen Saliva, Feces, etc.)

- A. Identification as the basic biological substance by chemical tests and other examinations
- B. Genetic marker characterization

VI. Toxicology - Qualitative and Quantitative Analysis and Interpretation NOT to Include Cause of Death in Humans

- A. Blood/Alcohol (Blood, Urine, Breath)
- B. Poisons
- C. Drug screening from blood and urine

VII. Controlled Drugs Other Than Marihuana

VIII. Marihuana

IX. Arson Materials

X. Explosives and Their Residues

XI. Hair Characterization - Animal and Human

XII. Natural and Synthetic Fibers - Fabrics Included

XIII. Paints

XIV. Glass

XV. Soils

XVI. Gunshot Residue - Founds on Hands

CONTINUED

1 OF 2

DATE: June 1, 1978

TO: The Forensic Science Community

FROM: Criminalistics Certification Study Committee

SUBJECT: Forensic Serology Questionnaire

The Criminalistics Certification Study Committee has prepared this questionnaire to assess:

1. The state of the art, that is, what is presently being done nationwide in the discipline of forensic serology.

2. What techniques the forensic serology community feels should be included in a possible certification testing program.

3. The background and qualifications of practicing forensic serologists.

When the results of this questionnaire are evaluated, the committee will have a better insight into what is being done in the discipline of forensic serology and what should be expected of forensic serologists.

So that a more accurate assessment can be made of what is being accomplished at the bench level, this questionnaire should be completed only by individuals analyzing blood and physiological fluids. In addition, you are requested to complete this questionnaire according to your evaluation of what you do and what you think should be included in a nationwide testing and evaluation program. Your responses should reflect your opinions and not necessarily the thoughts and wishes of your laboratory manager(s) and/or administrator(s).

This questionnaire is extensive, but not necessarily complete. If you apply techniques that are not listed or feel that additional techniques should be included in this questionnaire, please feel free to add them. These additions will be appreciated and definitely considered in the final analysis.

Please feel free to recommend a technique for national testing, even though your laboratory may not be presently proficient in this area (for example, isoenzymes). The present thinking of the committee is to divide the complicated and involved subject of forensic serology into sections. These sections will be determined by a careful evaluation of this questionnaire.

The responses to this questionnaire both with respect to the individual and the organization will be kept confidential.

Because many criminalists either belong to a number of professional associations or are on a number of mailing lists, you may receive multiple questionnaires. Please only respond once, in order that the statistical analysis of the data will be accurate.

If you are the recipient of this questionnaire and are not working with blood and physiological fluid cases, please forward it to an individual who is doing these types of analyses.

Please be aware that an individual need not be a member of an association, society or organization in order to respond to this questionnaire. The only requirement is that an individual be actively involved in the analysis of blood and other physiological fluids.

Also note that this questionnaire has two parts...please complete both parts. Part two of the questionnaire should give the Criminalistics Certification Study Committee an insight into the present background and professional qualifications of those individuals responding to the questionnaire and also an idea as to what they feel should be the minimum qualifications for individuals practicing "forensic serology".

The committee appreciates your response to this questionnaire. We are aware of the variety of questionnaires that are constantly being distributed, however, this one will hopefully be an important step in establishing a professional basis for our discipline. We thank you for your participation and solicit your continuing input into this meaningful task.

Association Membership and Geographic Location Information

The CCSC is sending this questionnaire out through a number of different association newsletters, including all the regional forensic science organizations and such specialized publications as Forensic Serology News. The Committee would like to know if you are a member of any of these forensic organizations, the geographic area of the country in which you reside and the source from which you received this questionnaire, i.e., the one which you have filled out and returned.

1. Please check those organizations of which you are a member:

- NEAFS ☐
- MAAFS (Mid-Atlantic) ☐
- SAFS ☐
- MAFS (Midwest) ☐
- CAC ☐
- NWAFS ☐
- AAFS (American Academy) ☐

2. In which geographic area of the country do you reside?

- Northeast ☐
- Mid-Atlantic ☐
- Southern ☐
- Midwest ☐
- California ☐
- Northwest ☐

3. How did you receive this questionnaire; i.e., what was the source?

_____

Criminalistics Certification Study Committee

Forensic Serology Questionnaire

Part I Forensic Serology Questionnaire

Please place a checkmark in the appropriate column:

A. Technique(s) you are presently using.

B. Technique(s) you feel an individual analyzing blood and other physiological fluids should be familiar with and aware of, i.e., could be expected to be questioned on in a written examination in a possible certification program.

C. Technique(s) you feel an individual analyzing blood and other physiological fluids should be competent to actually perform in the laboratory, i.e., could be asked to demonstrate his proficiency with analyses of questioned samples in a possible certification testing program.

D. Technique(s) you feel an individual analyzing blood and other physiological fluids need not be familiar with and which should not be included in a possible certification testing program.

	A	B	C	D
SECTION 1 IDENTIFICATION OF BLOOD				
1.1. Microscopic (cytological)				
1.2. Catalytic tests				
1.2.1. Benzidine				
1.2.2. Phenolphthalin				
1.2.3. Leucomalachite green (p,p' Benzylidenebis N N-dimethylaniline)				
1.2.4. o-Tolidine				
1.2.5. Tetramethylbenzidine				
1.2.6. o-Dianisidine				
1.2.7. Luminol				
1.3. Crystal Tests				
1.3.1. Hematin (Teichmann)				
1.3.2. Pyridine hemochromogen (Takayama)				
1.4. Spectroscopic				
1.5. Spectrophotometric				
1.6. Anti-human hemoglobin sera				
1.7. Electrophoretic methods				
1.8. Other(s)...please list				
SECTION 2 DETERMINATION OF SPECIES OF ORIGIN				
2.1. Immunological methods				
2.1.1. Precipitin tube test				
2.1.2. Double diffusion in agar gels (Ouchterlony)				
2.1.3. Crossed over electrophoresis				
2.1.4. Counter electrophoresis				

	A	B	C	D
2.1.5. Latex particles coated with anti-human sera (sensitized particles)				
2.1.6. Anti-human hemoglobin				
2.2. Isozyme patterns				
2.3. Other(s)				
SECTION 3 INDIVIDUALIZATION OF BLOOD				
3.1. Red cell antigens				
3.1.1. ABO system				
3.1.1.1. Whole blood				
3.1.1.1.1. Forward				
3.1.1.1.2. Reverse				
3.1.1.1.3. Slide technique				
3.1.1.1.4. Tube technique				
3.1.1.1.5. Subtyping of A and B				
3.1.1.1.6. Irregular antibody identification				
3.1.1.1.7. Other(s)				
3.1.1.2. Dried blood				
3.1.1.2.1. Absorption elution				
3.1.1.2.2. Absorption inhibition				
3.1.1.2.3. Mixed agglutination				
3.1.1.2.4. Ammonia extraction				
3.1.1.2.5. Agglutinin detection (Lattes)				
3.1.1.2.6. Fluorescent antibody				
3.1.1.2.7. Sensitized particles (Latex)				
3.1.1.3. Hair				
3.1.1.4. Perspiration				
3.1.1.5. Teeth				
3.1.1.6. Cerumen				
3.1.1.7. Fingernail/toenail				
3.1.1.8. Other tissues				
3.1.2. Rhesus (Rh-Hr)				
3.1.2.1. Whole blood				
3.1.2.1.1. Rh_0(D)				
3.1.2.1.2. rh' (C)				
3.1.2.1.3. rh'' (E)				
3.1.2.1.4. hr' ($\bar{c}$)				
3.1.2.1.5. hr'' ($\bar{e}$)				
3.1.2.1.6. hr ($\bar{c}\bar{e}$) (f)				
3.1.2.1.7. rh^w (c^w)				
3.1.2.1.8. D^u testing				
3.1.2.2. Dried blood				
3.1.2.2.1. Absorption elution				
3.1.2.2.1.1. Enzyme treated indicator cells				
3.1.2.2.1.2. Albumin overlay method				

	A	B	C	D
3.1.2.2.1.3. Coombs detection				
3.1.2.2.1.4. Thread technique				
3.1.2.2.1.5. Detectable antigens				
3.1.2.2.1.5.1. Rh_0(D)				
3.1.2.2.1.5.2. rh' (C)				
3.1.2.2.1.5.3. rh'' (E)				
3.1.2.2.1.5.4. hr' ($\bar{c}$)				
3.1.2.2.1.5.5. hr^{s} ($\bar{e}$)				
3.1.2.2.1.5.6. rh^{w} (c^{w})				
3.1.2.2.1.5.7. Du				
3.1.3. MN system				
3.1.3.1. Whole blood				
3.1.3.2. Dried blood				
3.1.3.2.1. Absorption elution				
3.1.3.2.2. Other(s)				
3.1.4. S $\bar{s}$ system				
3.1.4.1. Whole blood				
3.1.4.2. Dried blood				
3.1.5. Kell				
3.1.5.1. Whole blood				
3.1.5.2. Dried blood				
3.1.6. Duffy				
3.1.6.1. Whole blood				
3.1.6.2. Dried blood				
3.1.7. Lewis				
3.1.7.1. Whole blood				
3.1.7.2. Dried blood				
3.1.8. Kidd				
3.1.8.1. Whole blood				
3.1.8.2. Dried blood				
3.1.9. Lutheran				
3.1.9.1. Whole blood				
3.1.9.2. Dried blood				
3.1.10. Other(s)				
3.2. Isozymes				
3.2.1. Phosphoglucomutase (PGM)				
3.2.1.1. Locus I				
3.2.1.2. Locus II				
3.2.1.3. Locus III				
3.2.2. Acid Phosphatase (ac P /EAP) Erythrocyte				
3.2.3. Esterase D (EsD)				
3.2.4. Adenylate kinase (AK)				
3.2.5. Adenosine deaminase (ADA)				
3.2.6. Glucose-6-phosphate dehydrogenase (G6PD)				
3.2.7. Glyoxalase I (GLO)				
3.2.8. 6-Phosphogluconate dehydrogenase (6 PGD)				
3.2.9. Peptidase A (Pep A)				
3.2.10. Carbonic Anhydrase II (CAII)				

	A	B	C	D
3.2.11. Glutamic-Pyruvic transaminase (GPT)				
3.2.12. Superoxide dimutase (SOD)				
3.2.13. Glutathione reductase (GSR)				
3.2.14. Pseudocholinesterase E_2 Locus				
3.2.15. Amylase II				
3.2.16. Phosphoglucose isomerase (PGI)				
3.2.17. Other(s)				
3.3. Serum Proteins				
3.3.1. Haptoglobin (Hp)				
3.3.2. Group specific component (Gc)				
3.3.3. Gm and Inv				
3.3.4. Transferrin				
3.3.5. Ceruloplasmin				
3.3.6. C3 Component of complement				
3.3.7. Albumin				
3.3.8. Other(s)				
3.4. Miscellaneous				
3.4.1. Histocompatibility				
3.4.2. Hemoglobins Hb				
3.4.2.1. A				
3.4.2.2. S				
3.4.2.3. C				
3.4.2.4. D				
3.4.2.5. F				
3.4.2.6. Other(s)				
3.4.3. Syphilis antibody				
3.4.4. Rheumatoid factor				
3.4.5. Biochemical profiling				
3.4.6. Other(s)				
SECTION 4 SEMEN IDENTIFICATION				
4.1. Microscopical				
4.1.1. Phase microscopy				
4.1.2. Chemical staining				
4.1.3. Differential interference contrast				
4.2. Chemical				
4.2.1. Seminal acid phosphatase				
4.2.1.1. Qualitative				
4.2.1.2. Quantitative				
4.2.2. Florence test (choline)				
4.2.3. Barberio test (spermine)				
4.2.4. Thin layer chromatography				
4.3. Immunological				
4.3.1. Precipitin				
4.3.1.1. Anti-human sperm serum				
4.3.1.2. Anti-human semen serum				

		A	B	C	D
4.4.	Electrophoretic				
	4.4.1. Seminal, vaginal and fecal acid phosphatase differentiation				
	4.4.1.1. Polyacrylamide				
	4.4.1.2. Electroimmunodiffusion				
	4.4.1.3. Isoelectric focusing				
	4.4.2. Creatine phosphokinase isoenzyme				
	4.4.3. Lactic dehydrogenase - X isoenzyme				
	4.4.4. α - Seminoprotein				
4.5.	Other(s)				
SECTION 5	SEMEN OR SEMEN/VAGINAL FLUID MIXTURES				
5.1.	Individualization				
	5.1.1. ABH				
	5.1.1.1. Absorption inhibition (A.I.)				
	5.1.1.2. Absorption elution (A.E.)				
	5.1.1.3. Both A.I. and A.E.				
	5.1.1.4. Other(s)				
	5.1.2. PGM				
	5.1.3. Pep A				
	5.1.4. Sperm diaphorase				
	5.1.5. Phosphoglucose isomerase				
	5.1.6. Lewis				
	5.1.7. HL-A				
	5.1.8. Other(s)				
SECTION 6	SALIVA IDENTIFICATION				
6.1.	Microscopical examination				
6.2.	Amylase				
	6.2.1. Starch-iodine				
	6.2.2. Phadebas amylase				
6.3.	Nitrite test				
6.4.	Triphenyltetrazolium chloride				
6.5.	Thiocyanate				
6.6.	Alkaline phosphatase				
6.7.	Individualization				
	6.7.1. ABH				
	6.7.1.1. A.I.				
	6.7.1.2. A.E.				
	6.7.1.3. A.I. and A.E.				
	6.7.2. Parotid protein electrophoresis				
	6.7.3. Other(s)				

		A	B	C	D
SECTION 7	URINE IDENTIFICATION				
7.1.	Microscopical Examination				
7.2.	Urea				
7.3.	Creatine				
7.4.	Odor				
7.5.	Other(s)				
SECTION 8	FECAL MATTER IDENTIFICATION				
8.1.	Microscopical				
8.2.	Urobilin and urobilinogen				
8.3.	Bacteriological constituents				
8.4.	Pathological constituents				
8.5.	Other(s)				
SECTION 9	MISCELLANEOUS PROCEDURES				
9.1.	Sexing bloodstains				
	9.1.1. Barr body				
	9.1.2. Y - Chromosome fluorescence				
	9.1.3. Radioimmunoassay (RIA)				
9.2.	Pregnancy determinations				
	9.2.1. Aminopeptidase isoenzyme				
9.3.	Menstrual blood				
	9.3.1. Fibrinolysin				
	9.3.2. LDH isoenzymes				
9.4.	Age determinations				
	9.4.1. Spectrophotometric (ammonical bloodstain extracts)				
	9.4.2. Fly larvae				
9.5.	Allergy profiling				
	9.5.1. Radioallergosorbent test (RAST)				
9.6.	Interpretation of bloodstain patterns*				
9.7.	PGM on body tissue other than blood and semen				
9.8.	Titration of antisera				
9.9.	Other(s)				

* blood splatter patterns

Criminalistics Certification Study Committee

Forensic Serology Questionnaire

Part II Background and Minimal Qualifications

Please place a check mark in the appropriate column (more than one check may be made in each area):

A. Your background and professional qualifications.

B. What you feel are the minimum qualifications a practicing forensic serologist should have.

	A	B
AREA 1 FORMAL BACKGROUND		
1.1. High school diploma		
1.2. Associate degree		
1.3. Bachelor of Science		
1.4. Bachelor of Arts		
1.5. Master's degree		
1.6. Ph.D.		
1.7. M.D.		
1.8. Other(s)...please list on reverse side		
AREA 2 MAJOR FIELD(S) OF STUDY		
2.1. Biology, or		
2.2. Biochemistry, or		
2.3. Chemistry, or		
2.4. Medical technology, or		
2.5. Criminalistics (forensic science program), or		
2.6. Other(s)...please list on reverse side		
AREA 3 SPECIALIZED TRAINING COURSES RELEVANT TO FORENSIC SEROLOGY		
3.1. F.B.I. basic blood course		
3.2. F.B.I. advanced blood course		
3.3. Regional associations workshops and seminars		
3.4. Internships		
3.5. Other(s)...please list on reverse side		
AREA 4 ON-THE-JOB TRAINING		
4.1. Formal training (formally organized, written and scheduled programs)		
4.1.1. None		
4.1.2. 1 day - 2 weeks		

		A	B
4.1.3.	2 weeks+ - 1 month		
4.1.4.	1 month+ - 3 months		
4.1.5.	3 months+ - 6 months		
4.1.6.	6 months+ - 1 year		
4.1.7.	More than 1 year		
4.2.	Informal training		
4.2.1.	None		
4.2.2.	1 day - 2 weeks		
4.2.3.	2 weeks+ - 1 month		
4.2.4.	1 month+ - 3 months		
4.2.5.	3 months+ - 6 months		
4.2.6.	6 months+ - 1 year		
4.2.7.	More than 1 year		
AREA 5	COURT TESTIMONY ON FORENSIC SEROLOGY (INCLUDING DEPOSITIONS)		
5.1.	None		
5.2.	1 - 5 times		
5.3.	6 - 10 times		
5.4.	11 - 20 times		
5.5.	21 - 50 times		
5.6.	51 - 100 times		
5.7.	More than 100 times		
AREA 6	WORK EXPERIENCE		
6.1.	Number of years performing forensic analyses		
6.1.1.	Up to 1 year		
6.1.2.	1 - 3 years		
6.1.3.	3 - 5 years		
6.1.4.	5 years or more		
6.2.	Number of years conducting blood and physiological fluid analyses		
6.2.1.	Up to 1 year		
6.2.2.	1 - 3 years		
6.2.3.	3 - 5 years		
6.2.4.	5 years or more		
6.3.	On the average, percentage of time working with blood and physiological fluid cases		
6.3.1.	1 - 10%		
6.3.2.	11 - 30%		
6.3.3.	31 - 60%		
6.3.4.	61 - 80%		
6.3.5.	81 - 100%		
6.4.	Number of serology cases (not specimens) worked per month		
6.4.1.	1 - 5		

	A	B
6.4.2. 6 - 10		
6.4.3. 11 - 15		
6.4.4. 16 - 20		
6.4.5. 21 or more		
6.5. Number of years worked without immediate supervision (that is you do the work and/or interpret the results - your supervisor does not interpret the results)		
6.5.1. Less than one		
6.5.2. 1 - 3 years		
6.5.3. 3+- 5 years		
6.5.4. 5+- 8 years		
6.5.5. 8+years or more		
AREA 7 PROFESSIONAL PAPERS AND/OR PUBLICATIONS		
7.1. Number of articles published or papers presented		
7.1.1. None		
7.1.2. 1 - 3		
7.1.3. 4 - 5		
7.1.4. 6 - 10		
7.1.5. 11 or more		
AREA 8 MEMBERSHIPS IN THE FOLLOWING TYPES OF FORENSIC ORGANIZATIONS:		
8.1. Specialized serology societies		
8.2. National or international forensic science societies		
8.3. Regional forensic associations		
8.4. Other technical societies - please list		

25 August 1978

TO: The Forensic Science Community
FROM: Criminalistics Certification Study Committee
SUBJECT: Hairs and Fibers Questionnaire

The Criminalistics Certification Study Committee has prepared this questionnaire to assess:

1. The state of the art, nationwide, in the forensic examination of hairs and fibers.

2. What techniques hairs and fibers examiners feel should be included in a possible certification testing program.

3. The background and qualifications of practicing hairs and fibers examiners.

When the results of this questionnaire are evaluated, the committee will have a better insight into the need for certification for hair and fiber examiners and, if so indicated, how to propose the best way to accomplish certification for this evidence category. So that a more accurate assessment can be made of what is being accomplished at a bench level, this questionnaire should be completed only by individuals examining hairs and fibers. In addition, you are requested to complete this questionnaire according to your evaluation of what you do and what you think should be included in a possible nationwide testing and evaluation program. Your responses should reflect your experience and not necessarily the thoughts and wishes of your laboratory manager(s) and/or administrator(s).

This questionnaire is extensive, but not necessarily complete. If you apply techniques that are not listed or feel that additional techniques should be included in this questionnaire, please feel free to add them. These additions will be appreciated and definitely considered in the final analysis.

Please feel free to recommend a technique for national testing (Column B), even though your laboratory may not be presently proficient in this area (for example, dispersion staining). The present thinking of the committee is to divide the complicated and involved subject of hairs and fibers into sections. These sections will be determined by a careful evaluation of this questionnaire.

Because many criminalists either belong to a number of professional associations or are on a number of mailing lists, you may receive multiple questionnaires. Please only respond once in order that the statistical analysis of the data will be accurate.

If you are the recipient of this questionnaire and are not working with hairs and fibers, please forward it to an individual who is doing these types of analyses.

Please be aware that an individual need not be a member of an association, society or organization in order to respond to this questionnaire. The only requirement is that an individual be actively involved in the examination of hairs and fibers.

Also note that this questionnaire has several parts...please complete all parts. Part three of the questionnaire should give the Criminalistics Certification Study Committee an insight into the present background and professional qualifications of those individuals responding to the questionnaire and also an idea as to what they feel should be minimum qualifications.

The committee appreciates your response to this questionnaire. We are aware of the variety of questionnaires that are constantly being distributed; however, this one will hopefully be an important step in establishing a professional basis for our discipline. We thank you for your participation and solicit your continuing input into this meaningful task.

Part I: Association Membership and Geographic Location Information

Please place an "X" in the appropriate boxes for those organizations of which you are a member and/or geographic area in which you reside. In addition, please indicate any other general nationwide forensic newsletters that you receive. Please circle the source(s) from which you received this questionnaire.

	Member	Geographic Area
Northeast/NEAFS	☐	☐
Mid-Atlantic/MAAFS	☐	☐
Southern/SAFS	☐	☐
Midwest/MAFS	☐	☐
California/CAC	☐	☐
Northwest/NWAFS	☐	☐
American Academy/AAFS	☐	
American Society of Crime Laboratory Directors/ASCLD	☐	
Forensic Serology Newsletter	☐	
Crime Lab Digest	☐	
Microgram	☐	
Others (please list)	☐	

Part II: Background and Minimal Qualifications

Please place a check mark in the appropriate column (more than one check may be made in each area).

A. Your background and professional qualifications.

B. What you feel are the minimum qualifications a practicing hairs and fibers examiner should have to be certified.

		FIBERS A	FIBERS B	HAIRS A	HAIRS B
AREA 1	FORMAL BACKGROUND				
	1.1 High school diploma				
	1.2 Associate degree				
	1.3 Bachelor of Science				
	1.4 Bachelor of Arts				
	1.5 Master's Degree				
	1.6 PhD				
	1.7 MD				
	1.8 Other(s)...please list				
AREA 2	MAJOR FIELD(s) OF STUDY				
	2.1 Biology				
	2.2 Biochemistry				
	2.3 Chemistry				
	2.4 Medical Technology				
	2.5 Criminalistics (Forensic Science Program)				
	2.6 Other(s)...please list				
AREA 3	SPECIALIZED TRAINING COURSES RELEVANT TO HAIRS AND FIBERS				
	3.1 FBI Academy				
	3.2 Regional associations, workshops and seminars				
	3.3 Internships				
	3.4 Other(s)...please list on reverse side				
AREA 4	ON-THE-JOB TRAINING				
	4.1 Formal training (formally organized, written and scheduled programs)				
	4.1.1 None				
	4.1.2 1 day - 3 months				
	4.1.3 3 months - 6 months				
	4.1.4 6 months - 1 year				
	4.1.5 1 year or more				
	4.2 Informal training				
	4.2.1 None				
	4.2.2 1 day - 3 months				
	4.2.3 3 months - 6 months				
	4.2.4 6 months - 1 year				
	4.2.5 1 year or more				
	4.2.6 Continuous				
AREA 5	COURT TESTIMONY (INCLUDING DEPOSITIONS)				
	5.1 None				
	5.2 1 - 25 times				
	5.3 25 - 50 times				
	5.4 50 - 100 times				
	5.5 100 times or more				
AREA 6	WORK EXPERIENCE				
	6.1 Number of years performing forensic analyses				
	6.1.1 Up to 1 year				
	6.1.2 1 - 3 years				

		FIBERS and/or HAIRS A	B
AREA 6 (continued)			
6.1.3	3 - 5 years		
6.1.4	5 years or more		
6.2	Number of years examining hairs and fibers		
6.2.1	Up to 1 year		
6.2.2	1 - 3 years		
6.2.3	3 - 5 years		
6.2.4	5 years or more		
6.3	Percentage of time working hairs and fibers cases		
6.3.1	1 - 10%		
6.3.2	10 - 30%		
6.3.3	30 - 60%		
6.3.4	60 - 80%		
6.3.5	80 - 100%		

		HAIRS A	B
6.4	Number of hairs and fibers cases (not specimens) worked per month		
6.4.1	1 - 5		
6.4.2	5 - 10		
6.4.3	10 - 15		
6.4.4	15 - 20		
6.4.5	20 or more		

		A	B
6.5	Number of years worked without immediate supervision (that is, you do the work and/or interpret the results - your supervisor does not interpret the results)		
6.5.1	Less than one		
6.5.2	1 - 3 years		
6.5.3	3 - 5 years		
6.5.4	5 - 8 years		
6.5.5	8 years or more		
AREA 7	PROFESSIONAL PAPERS AND/OR PUBLICATIONS		
7.1	Number of articles published or presented		
7.1.1	None		
7.1.2	1 - 3		
7.1.3	3 - 5		
7.1.4	5 - 10		
7.1.5	10 or more		
AREA 8	PROFESSIONAL SOCIETIES		
8.1	Number of memberships in technical societies		
8.1.1	None		
8.1.2	1 - 3		
8.1.3	3 - 5		
8.1.4	5 - 8		
8.1.5	8 - 10		
8.1.6	10 or more		

Part III: Hairs and Fibers Background

Please place a checkmark in the appropriate column:

A. Technique(s) you are presently performing or feel competent to use.

B. Technique(s) you feel a criminalist examining hairs and fibers should be familiar with even though you may not perform them. In other words, technique(s) you feel could be expected to be covered in a written certification examination.

C. Technique(s) you feel a criminalist examining hairs and fibers should be competent to actually perform in the laboratory, i.e., could be asked to demonstrate proficiency with analyses of questioned samples in possible certification testing program.

D. Technique(s) you feel a criminalist examining hairs and fibers need not be familiar with and which should not be included in a possible certification testing program.

We suggest it may be easier to go through this questionnaire four times, once each for A, B, C and D.

Fibers may be submitted to the criminalist as individual fibers or in the form of textiles, paper, wood or rope. The first two pages cover the latter possibilities. Examination of single fibers is covered on the second and succeeding pages.

FIBER SOURCES

		A	B	C	D
1.0	Textiles				
1.1	physical fit				
1.2	woven textiles				
1.2.1	weave				
1.2.2	fiber counts				
1.2.3	isolation of individual fibers				
1.2.3.1	classification of fibers by type (synthetic, plant etc.)				

	A	B	C	D
1.2.3.2 identification of fibers (see 4.0, 6.0 and 7.0 under "Individual Fibers")				
1.3 nonwoven textiles				
1.3.1 structure				
1.3.2 composition				
1.3.2.1 solubility				
1.3.2.2 IR				
1.3.2.3 GC, pyrolytic				
1.4 other				
2.0 Paper				
2.1 physical fit				
2.2 type of paper (bond, tissue, newsprint etc.)				
2.3 isolation of fibers				
2.4 isolation of coating "pigments", if present				
2.5 isolation of binder, if present				
2.6 classification of fibers (wood, rag, glass etc.)				
2.7 identification of fibers (see 4.0-8.0 under individual fibers)				
2.8 identification of inorganic coating components				
2.8.1 shape				
2.8.2 optical properties				
2.8.2.1 refractive indices				
2.8.3 microchemical tests				
2.8.4 x-ray diffraction				
2.9 identification of organic binder				
2.9.1 solubility				
2.9.2 IR				
2.9.3 GC, pyrolytic				
2.10 other				
3.0 Wood				
3.1 physical fit				
3.2 preparation of sections				
3.2.1 classification of wood (soft, hard)				
3.2.2 identification of species				
3.3 preparation of single fiber preps				
3.3.1 identification of species				
3.3.1.1 wood sections				
3.3.1.2 fiber characteristics (pits, cell types etc.)				
3.4 other				
4.0 Rope				
4.1 physical fit				
4.2 construction (twists, number of strands etc.)				
4.3 isolation of individual fibers				
4.4 identification of fibers (see 4.0 and 6.0 under "Individual Fibers")				
4.5 other				

INDIVIDUAL FIBERS

1.0 Classification (i.e., determination of type, e.g., vegetable, wood, synthetic organic, trichomes, glass, mineral; miscellaneous: feather, seed hairs, metal, carbon)				
2.0 Hair, human				
2.1 body area				
2.2 race				
2.3 sex				
2.3.1 Barr body				
2.3.2 sex chromosome				
2.3.3 radioimmunoassay				
2.4 individualization				
2.4.1 color				
2.4.2 length				
2.4.3 diameter				
2.4.4 crossection				
2.4.5 density				
2.4.6 pigment size, color, distribution				
2.4.7 medulla (continuous, discontinuous, medullary index etc.)				
2.4.8 curl				

reminders:
A. you are competent
B. familiarity necessary for certification
C. competence necessary for certification
D. familiarity not necessary for certification

	A	B	C	D
2.4.9 scale shape				
2.4.10 scale count				
2.4.11 root characteristics				
2.4.12 fluorescence				
2.4.13 refractive index (average)				
2.4.14 refractive indices (ǁ and ⊥)				
2.4.14.1 Becke line at room temperature				
2.4.14.2 Emmon's double variation				
2.4.14.3 dispersion staining				
2.4.15 trace elements				
2.4.16 condition of hair (damage, foreign material, vermin etc.)				
2.4.17 treatments (dyes, bleaches, conditions etc.)				
2.4.17.1 described				
2.4.17.2 identify				
2.4.17.3 method				
2.4.18 rare conditions (Pili anulata, Alopecia seborrhoicum etc.)				
2.4.19 ABO blood groupings				
2.4.20 Rhesus (Rh-Hr)				
2.4.21 MN system				
2.4.22 other				
3.0 Hairs, other animal				
3.1 species				
3.1.1 color				
3.1.2 length				
3.1.3 diameter				
3.1.4 crossection				
3.1.5 pigment size, color, distribution				
3.1.6 medulla				
3.1.7 curl				
3.1.8 scale shape				
3.1.9 scale count				
3.1.10 other				
4.0 Plant fibers other than wood				
4.1 classification (leaf, grass, seed hairs, trichomes, bast etc.)				
4.2 identification of species				
4.2.1 morphology				
4.2.1.1 crossection				
4.2.1.2 length				
4.2.1.3 surface markings				
4.2.1.4 medulla				
4.2.1.5 fiber ends				
4.2.1.6 other				
4.2.2 optical properties (e.g., lack of extinction with crossed polars = cotton)				
4.2.3 staining (Herzberg etc.)				
5.0 Wood fibers				
5.1 morphology				
5.1.1 chemical vs mechanical				
5.1.1.1 fiber condition				
5.1.2 softwood vs hardwood				
5.1.2.1 pitting of cells				
5.1.2.2 other				
5.1.3 species				
5.1.3.1 cell dimensions				
5.1.3.2 pitting of cells				
5.1.3.3 other				

reminders:
A. you are competent
B. familiarity necessary for certification
C. competence necessary for certification
D. familiarity not necessary for certification

	A	B	C	D
6.0 Synthetic fibers				
6.1 morphology				
6.1.1 crossection (by optical sectioning)				
6.1.2 surface markings				
6.1.3 diameter				
6.1.4 delustrant				
6.1.4.1 size				
6.1.4.2 distribution				
6.1.4.3 loading				
6.1.4.4 optical properties				
6.1.4.4.1 refractive index				
6.1.4.4.2 birefringence				
6.1.4.5 elemental analysis				
6.1.4.5.1 microchemical test				
6.1.4.5.2 x-ray fluorescence				
6.1.4.5.3 emission spec				
6.1.5 dyes				
6.1.5.1 color				
6.1.5.2 extraction				
6.1.5.3 identification				
6.1.5.3.1 method used				
6.2 optical properties				
6.2.1 color				
6.2.1.1 visual				
6.2.1.2 microspectrophotometry				
6.2.2 refractive index				
6.2.2.1 average				
6.2.2.2 parallel and perpendicular				
6.2.2.2.1 dispersion staining				
6.2.2.2.2 Becke line method, room temperature				
6.2.2.2.3 Emmon's double variation method				
6.2.3 birefringence				
6.2.3.1 qualitative				
6.2.3.2 quantitative				
6.2.4 sign of elongation				
6.2.4.1 compensator				
6.2.4.2 from 6.2.2.2				
6.2.5 fluorescence				
6.2.6 hot stage methods				
6.2.6.1 melting point alone				
6.2.6.2 eutectic melting point with p-nitrophenol				
6.3 IR				
6.3.1 KBr pellet				
6.3.2 diamond cell				
6.3.3 pyrolysis				
6.4 GC, pyrolysis				
6.5 GC/MS, pyrolysis				
6.6 staining				
6.7 solubility				
6.8 density				
6.9 other				
7.0 Glass fibers				
7.1 morphology				
7.1.1 diameter				
7.1.1.1 average, range, uniformity				
7.2 optical properties				
7.2.1 refractive index				
7.2.1.1 Becke line method				
7.2.1.2 dispersion staining				
7.2.1.3 Emmon's double variation of refractive index				
7.2.2 dispersion				
7.2.2.1 monochromator or filters				
7.2.2.1.1 Emmon's double variation				
7.2.3 fluorescence				
7.3 binder				
7.3.1 fluorencence				
7.3.2 color				
7.3.3 refractive index				

reminders:
A. you are competent
B. familiarity necessary for certification
C. competence necessary for certification
D. familiarity not necessary for certification

	A	B	C	D
7.3.4 imbedded particles				
7.3.5 solubility				
7.4 solubility				
7.5 other				
8.0 Mineral fibers (asbestos)				
8.1 morphology				
8.1.1 length				
8.1.2 diameter				
8.1.3 curl				
8.2 optical properties				
8.2.1 birefringence (qualitative)				
8.2.2 extinction				
8.2.3 refractive indices				
8.2.3.1 average				
8.2.3.2 Becke line methods				
8.2 3.3 dispersion staining				
8.3 x-ray diffraction				
8.4 other				
9.0 Miscellaneous fibers (carbon, metallic, rubber, feather etc.)				
9.1 morphology				
9.1.1 length				
9.1.2 diameter				
9.1.3 surface markings				
9.1.4 medulla				
9.1.5 elasticity				
9.2 optical properties				
9.2.1 color				
9.2.2 reflectance				
9.2.3 refractive indices				
9.2.3.1 Becke line, room temperature				
9.2.3.2 dispersion staining				
9.2.3.3 Emmon's double variation				
9.3 composition				
9.3.1 elemental analysis (inorganic)				
9.3.1.1 method				
9.3.2 functional groups (organic)				
9.3.2.1 IR				
9.3.2.2 GC/MS, pyrolytic				
9.3.2.3 other				

reminders:
A. you are competent
B. Familiarity necessary for certification
C. competence necessary for certification
D. familiarity not necessary for certification

DATE: November 20, 1978
TO: The Forensic Science Community
FROM: Criminalistics Certification Study Committee
SUBJECT: Forensic Drug Chemistry Questionnaire

The Criminalistics Certification Study Committee has prepared this questionnaire to assess:

1. The state of the art, that is, what is presently being done nationwide in the discipline of forensic drug chemistry.

2. What techniques the forensic drug chemistry community feels should be included in a possible certification testing program.

3. The background and qualifications of practicing forensic drug chemists.

When the results of this questionnaire are evaluated, the committee will have a better insight into what is being done in the discipline of forensic drug chemistry and what should be expected of forensic drug chemists.

So that a more accurate assessment can be made of what is being accomplished at the bench level, this questionnaire should be completed only by individuals analyzing drugs. In addition, you are requested to complete this questionnaire according to your evaluation of what you do and what you think should be included in a nationwide testing and evaluation program. Your responses should reflect your opinions and not necessarily the thoughts and wishes of your laboratory manager(s) and/or administrator(s).

This questionnaire is extensive, but not necessarily complete. If you apply techniques that are not listed or feel that additional techniques should be included in this questionnaire, please feel free to add them. These additions will be appreciated and definitely considered in the final analysis.

Please feel free to recommend a technique for national testing, even though your laboratory may not be presently proficient in this area (for example, GC/MS). The present thinking of the committee is to divide the complicated and involved subject of forensic drug chemistry into sections. These sections will be determined by a careful evaluation of this questionnaire.

The responses to this questionnaire both with respect to the individual and the organization will be kept confidential.

Because many criminalists either belong to a number of professional associations or are on a number of mailing lists, you may receive multiple questionnaires. Please only respond once, in order that the statistical analysis of the data will be accurate.

If you are the recipient of this questionnaire and are not working with drug cases, please forward it to an individual who is doing these types of analyses.

Please be aware than an individual need not be a member of an association, society or organization in order to respond to this questionnaire. The only requirement is that an individual be actively involved in the analysis of drugs.

Also note that this questionnaire has three parts...all individuals currently actively engaged in the analysis of drugs, in "street" form or in physiological fluids, should complete Parts I and II and that/those section(s) of Part III which correspond(s) to his/her area of expertise. For example, an active drug chemist who analyses Cannabis and other controlled substances in "street" form alone should only complete Sections I and II of Part III.

Part II of the questionnaire should give the Criminalistics Certification Study Committee an insight into the present background and professional qualifications of those individuals responding to the questionnaire and also an idea as to what they feel should be the minimum qualifications for individuals practicing "forensic drug chemistry".

The committee appreciates your response to this questionnaire. We are aware of the variety of questionnaires that are constantly being distributed, however, this one will hopefully be an important step in establishing a professional basis for our discipline. We thank you for your participation and solicit your continuing input into this meaningful task.

Part I: Association Membership and Geographic Location Information

Please place an "X" in the appropriate boxes for those organizations of which you are a member and/or geographic area in which you reside. In addition, please indicate any other general nationwide forensic newsletters that you receive. Please circle the source(s) from which you received this questionnaire.

	Member	Geographic Area
Northeast/NEAFS		
Mid-Atlantic/MAAFS		
Southern/SAFS		
Midwest/MAFS		
California/CAC		
Northwest/NWAFS		
Southwest		
American Academy/AAFS		
American Society of Crime Laboratory Directors/ASCLD		
Crime Lab Digest		
Microgram		
Others (please list)		

PART II: Background and Minimal Qualifications

Please place a check mark in the appropriate columns (more than one check may be made in each area). If you are performing analyses of solid dosage drugs, please mark your responses in the DRUG CHEMISTRY columns; if you are performing toxicological analyses, use the TOXICOLOGY columns. If you are performing both types of analyses then use both sets of columns for your responses.

A. Your background and professional qualifications.
B. What you feel are the minimum qualifications a practicing forensic drug chemist should have to be certified.

		DRUG CHEMISTRY			TOXICOLOGY	
		A	B		A	B
AREA 1	FORMAL BACKGROUND (Check only highest degree)					
	1.1 High school diploma					
	1.2 Associate degree					
	1.3 Bachelor of Science					
	1.4 Bachelor of Arts					
	1.5 Master's degree					
	1.6 Ph.D.					
	1.7 M.D.					
	1.8 Other(s)...please list on reverse side					
AREA 2	MAJOR FIELD(S) OF STUDY					
	2.1 Biology					
	2.2 Biochemistry					
	2.3 Chemistry					
	2.4 Medical Technology					
	2.5 Criminalistics (Forensic Science Program)					
	2.6 Other(s)...please list					
AREA 3	SPECIALIZED TRAINING COURSES RELEVANT TO FORENSIC DRUG CHEMISTRY					
	3.1 D.E.A. basic drug course					
	3.2 Regional associations workshops and seminars					
	3.3 Internships					
	3.4 Other(s)...please list on reverse side					
AREA 4	ON-THE-JOB TRAINING					
	4.1 Formal training (formally organized, written and scheduled programs)					
	4.1.1 None					
	4.1.2 1 day - 2 weeks					
	4.1.3 2 weeks+ - 1 month					
	4.1.4 1 month+ - 3 months					
	4.1.5 3 months+ - 6 months					
	4.1.6 6 months+ - 1 year					
	4.1.7 More than 1 year					
	4.2 Informal training					
	4.2.1 None					
	4.2.2 1 day - 2 weeks					
	4.2.3 2 weeks+ - 1 month					
	4.2.4 1 month+ - 3 months					
	4.2.5 3 months+ - 6 months					
	4.2.6 6 months+ - 1 year					
	4.2.7 More than 1 year					

		DRUG CHEMISTRY			TOXICOLOGY	
		A	B		A	B
AREA 5	COURT TESTIMONY ON FORENSIC DRUG CHEMISTRY (INCLUDING DEPOSITIONS)					
	5.1 None					
	5.2 1 - 5 times					
	5.3 6 - 10 times					
	5.4 11 - 20 times					
	5.5 21 - 50 times					
	5.6 51 - 100 times					
	5.7 More than 100 times					
AREA 6	WORK EXPERIENCE					
	6.1 Number of years performing forensic analyses					
	6.1.1 Up to 1 year					
	6.1.2 1+ - 3 years					
	6.1.3 3+ - 5 years					
	6.1.4 5 years+ or more					
	6.2 Number of years conducting drug analyses					
	6.2.1 Up to 1 year					
	6.2.2 1+ - 3 years					
	6.2.3 3+ - 5 years					
	6.2.4 5 years+ or more					
	6.3 On the average, percentage of time working with drug cases					
	6.3.1 1 - 10%					
	6.3.2 11 - 30%					
	6.3.3 31 - 60%					
	6.3.4 61 - 80%					
	6.3.5 81 - 100%					
	6.4 Number of drug cases (not specimens) worked per month					
	6.4.1 1 - 20					
	6.4.2 21 - 40					
	6.4.3 41 - 60					
	6.4.4 61 - 80					
	6.4.5 81 - 100					
	6.4.6 101 or more					
	6.5 Number of years worked without immediate supervision (that is, you do the work and/or interpret the results - your supervisor does not interpret the results)					
	6.5.1 Less than one					
	6.5.2 1 - 3 years					
	6.5.3 3+ - 5 years					
	6.5.4 5+ - 8 years					
	6.5.5 8+ years or more					
AREA 7	PROFESSIONAL PAPERS AND/OR PUBLICATIONS					
	7.1 Number of articles published or papers presented					
	7.1.1 None					
	7.1.2 1 - 3					
	7.1.3 4 - 5					
	7.1.4 6 - 10					
	7.1.5 11 or more					
AREA 8	MEMBERSHIPS IN THE FOLLOWING TYPES OF ORGANIZATIONS					
	8.1 Specialized chemical societies					
	8.2 National or international forensic science societies					
	8.3 Regional forensic associations					
	8.4 Other technical societies - please list					
	8.5 None					

Part III: Forensic Drug Chemistry Questionnaire

Please place checkmarks in the appropriate column(s):

A. Technique(s) you are presently using.

B. Technique(s) you feel an individual analyzing drugs should be familiar with and aware of, i.e., could be expected to be questioned on in a written examination in a possible certification program.

C. Technique(s) you feel an individual analyzing drugs should be competent to actually perform in the laboratory, i.e., could be asked to demonstrate his proficiency with analyses of questioned samples in a possible certification testing program.

D. Technique(s) you feel an individual analyzing drugs need not be familiar with and which should not be included in a possible certification testirg program.

SECTION 1. IDENTIFICATION OF CANNABIS (MARIJUANA, HASHISH, HASHISH OIL, ETC.)

	A	B	C	D
1.1 Microscopical (morphological)				
1.1.1 Low power (< 100X)				
1.1.2 High power (≥ 100X)				
1.1.3 Effervescence				
1.2 Color Tests				
1.2.1 Duquenois (without chloroform)				
1.2.2 Duquenois-Levine (Modified)				
1.2.3 Duquenois-Levine (Rapid)				
1.2.4 Other(s)...please list				
1.3 Chromatographic Techniques				
1.3.1 Thin-layer				
1.3.1.1 Qualitative				
1.3.1.1.1 Single System				
1.3.1.1.2 Multiple systems				
1.3.1.2 Quantitative				
1.3.2 Gas-Vapor Phase				
1.3.2.1 Qualitative				
1.3.2.1.1 Single column				
1.3.2.1.2 Multiple columns				
1.3.2.2 Quantitative				
1.4 Gas Chromatography/Mass Spectrometry				
1.5 Other(s)...please list				

SECTION 2. IDENTIFICATION OF CONTROLLED SUBSTANCES OTHER T'AN CANNABIS

	HEROIN				AMPHET-AMINES				BARBI-TURATES				COCAINE				LSD				PCP			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
2.1 Visual Techniques																								
2.1.1 Compendia (e.g. PDR)																								
2.1.2 Color Tests																								
2.1.3 Microcrystalline Tests																								
2.1.4 Microscopical																								
2.1.4.1 Polarizing																								
2.1.4.2 Phase																								
2.1.4.3 Hot stage																								
2.1.4.4 Compound (Biological)																								
2.1.2.5 Other(s)...please list																								
2.2 Chromatographic Techniques																								
2.2.1 Thin-Layer																								
2.2.2.1 Single system																								
2.2.2.2 Multiple systems																								
2.2.2 Gas/Vapor Phase																								
2.2.2.1 Single column																								
2.2.2.2 Multiple column																								
2.2.3 Paper																								
2.2.4 Column																								
2.2.5 High Performance LC																								

	HEROIN				AMPHET-AMINES				BARBI-TURATES				COCAINE				LSD				PCP			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
2.3 Other Instrumental Methods																								
2.3.1 Ultra-Violet-Visible																								
2.3.2 Infrared Spectroscopy																								
2.3.3 Fluorometry																								
2.3.4 Nuclear Magnetic Resonance																								
2.3.5 Polarimetry/ORD																								
2.3.6 (Gas Chromatography)Mass Spec																								
2.3.7 X-Ray Diffraction																								
2.3.8 Raman Spectroscopy																								
2.3.9 Other(s)...please list																								
2.4 General Procedures																								
2.4.1 Excipient Analysis																								
2.4.2 Melting Point Determination																								
2.4.3 Mixed Melting Point																								
2.4.4 Distillation																								
2.4.5 Titration																								
2.4.6 Solubility																								
2.4.7 Refractive Index																								
2.4.8 Organic Extraction																								
2.4.9 Derivatization																								
2.4.10 Preparative Chromatography																								
2.4.11 Quantitation																								
2.4.12 Other(s)...please list																								

SECTION 3. TOXICOLOGY

	A	B	C	D
3.1 Alcohol				
3.1.1 Sample Form				
3.1.1.1 Blood				
3.1.1.1.1 Qualitative				
3.1.1.1.2 Quantitative				
3.1.1.2 Urine				
3.1.1.2.1 Qualitative				
3.1.1.2.2 Quantitative				
3.1.1.3 Breath				
3.1.1.4 Other(s)...please list				
3.1.2 Method(s)				
3.1.2.1 Gas Chromatographic/Head Space				
3.1.2.1.1 With Internal Standard				
3.1.2.1.2 Without Internal Standard				
3.1.2.2 Gas Chromatographic/Direct Injection				
3.1.2.2.1 With Internal Standard				
3.1.2.2.2 Without Internal Standard				
3.1.2.3 Diffusion				
3.1.2.3.1 Titration				
3.1.2.3.2 Colorimetry				
3.1.2.4 Enzyme (Alcohol dehydrogenase)				
3.1.2.5 Distillation				
3.1.2.6 Other(s)...please list				
3.2 Drugs				
3.2.1 Sample Form				
3.2.1.1 Blood				
3.2.1.1.1 Qualitative				
3.2.1.1.2 Quantitative				
3.2.1.2 Urine				
3.2.1.2.1 Qualitative				
3.2.1.2.2 Quantitative				
3.2.1.3 Other(s)...please list				
3.2.2 Method(s)				
3.2.2.1 Gas Chromatography				
3.2.2.1.1 Single column				

		A	B	C	D
	3.2.2.1.2 Multiple columns				
3.2.2.2	Thin-Layer Chromatography				
	3.2.2.2.1 Single system				
	3.2.2.2.2 Multiple systems				
3.2.2.3	Fluorometry				
3.2.2.4	Radio-Immuno Assay (RIA)				
3.2.2.5	Enzyme Multiplied Immuno-Assay Tech. (EMIT)				
3.2.2.6	(Gas Chromatography)/Mass Spectrometry				
	3.2.2.6.1 Electron Impact (EI)				
	3.2.2.6.2 Chemical Ionization (CI)				
3.2.2.7	Ultraviolet-Visible Spectroscopy				
3.2.2.8	Infrared				
3.2.2.9	Atomic Absorption				
3.2.2.10	Free Radical Assay Technique (FRAT)				
3.2.2.11	Spot Tests				
3.2.2.12	Other(s)...please list				