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Lowell W. Bradford

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CRIMINALISTICS LOOKS FORWARD

LOWELL W. BRADFORD

The author is Director, Laboratory of Criminalistics, County of Santa Clara, San Jose, California. He is a graduate of the University of California, and active in a number of professional organizations, including the American Academy of Forensic Sciences, and the California Association of Criminalists. Mr. Bradford is co-author of *The Crime Laboratory, Organization and Administration* (Thomas 1965), and has published extensively in various technical journals. His present paper was presented at the second National Symposium on Law Enforcement Science and Technology, I.T.T. Research Institute, Chicago, April 1968.—EDITOR.

The vast majority of laboratories engaged in scientific crime detection in this country are small units staffed with less than five scientific personnel, many have but one or two; few, if any, of the laboratories both large and small have developed through any program of planning or prediction. At the local government level, they have grown in response to the urgent and critical needs of particular police problems, and the resulting limitations and shortcomings are the consequence of a complete lack of directed planning. In general, they operate a makeshift workspace or in limited floor space; are understaffed, underequipped, but overloaded with case work and staff duties. Opportunities for programmed in-service professional career development are practically non-existent. The few professionals in this newly developing field have literally pulled themselves to their present level of knowledge and successful operations by their own bootstraps.

The favorable part of this picture of the current status of Criminalistics is that despite the lack of research and development support or general governmental planning in this field, the last two decades have seen a tremendous development in technical methodology, professional doctrine, and operational concepts.

Thus the general practice of Criminalistics is a drama in which the backdrop has been administrative adversity, i.e. public failure to provide implementation in forensic science, the players symbolize technical and professional progress, the music plays the melody of the mushrooming needs of society, and lyrics include the public clamor for better police service. This clamor is sometimes raised by the same group who produce the adversity. The program of this drama describes Act I as the status quo in which the final scene called "How" poses a situation which has great potential

for future development. Act II is not yet written.

Successful future development will depend heavily upon directed planning to meet projected problems. These projections must take into account the elements of administration, operations, and logistics before any suitable technical programs can be established.

There have been vast technological developments in recent years in industry, especially in connection with space programs. Much of this technology has yet to be applied to the physical evidence aspects of criminal and civil law.

Before this can be done, there must be an understanding of the nature of *Criminalistics* or more broadly speaking, *Forensic Science*.

General Criminalistics includes selected phases of the practice of analytical chemistry, applied physics, microscopy, biochemistry, immunology, technical photography, and a number of other basic sciences as well as trade skills from selected vocations. The general practice of Criminalistics in many ways resembles the general practice of medicine. The physician treats patients; whereas the criminalist treats the physical evidence problems of the law; and like medicine, in each case, the problem is volunteered, not solicited. The patient calls upon the physician with signs of ill health. By an overview of history, the physician interprets signs and symptoms together with laboratory tests and makes a diagnosis. Then he treats the problem with all available scientific knowledge and professional skill. The same is true in criminalistics. The lawman with the problem seeks the criminalistics operation for a solution. He places his problem in the hands of the criminalist and expects the application of all current scientific knowledge together with professional

skill and ingenuity in the solution of that problem.

In order to fulfill this expected function, the criminalist must first be a scientist. Secondly, he must understand the concepts of the law and the rules of evidence. Thirdly, he must be a true professional in that he has developed: (1) a sense of altruism; (2) a concept of ministry—meaning that through highly specialized knowledge he assumes the responsibility for the vital affairs of others; (3) an ethical doctrine which provides conduct guidelines in the vicissitudes of scientific-legal strife.

These are qualifications which do not at the present time result from any academic curriculum. One of the first objectives of *Looking Forward*, therefore, is to bring about a center of training in which the adequately qualified criminalist can be developed.

The most urgent matter to be attended to is a consideration of some of the problems to be solved in the field of criminalistics education.

As well as planning a competent and comprehensive program of training which will place professional criminalists in the field, it is immediately important to head off any attempts by schools of police administration and criminology who intend to put forward a program in criminalistics which is a degree program in name only. The shortcomings of such deceiving programs can only lead to long range damage to the entire field of criminalistics.

In rising to the recent outcries concerning the shortage of qualified applicants for positions in criminalistics operations, several vocational type school programs have created group majors leading to a certificate as a technician in criminalistics or to a degree in criminalistics. A close look at these curricula shows that they lack the proper amount of chemistry, physics, microscopy, biochemistry, microchemistry, and subjects devoted to professional aspects to meet the needs of the field. An exploration of course content indicates in many cases that specific courses dubbed "Criminalistics" have inadequate, or inapplicable content. An examination of the teaching staff in most cases demonstrates a lack of qualifications. Most are not qualified criminalists and have never practiced criminalistics or forensic science in any form. The only qualification of some is experience in detective work.

We must face the fact that there are relatively few Criminalists with professional qualifications

who have both the aptitude and desire for teaching.

To try to distribute the available potential educators among a number of institutions through the land would be to splinter and destroy the potential that is available for consolidation. It would be more sensible to collect a teaching staff at one institution and organize a fundamental curriculum which has both breadth and depth. Such a concentration of capabilities could lead to a reference center for standards, to archives of reference and test materials, and other data which would be available to the profession at large.

Such archives are currently nonexistent. For example, there is no central comprehensive collection of firearms, ammunition, hair, fibers, woods, pollens, glass, paints, tire patterns, etc., which has been collected with the aim of criminalistics application and which is available to criminalists throughout the country.

The first requirement of a teaching program in Criminalistics is the recruitment of a chairman who is a contemporary leader in the field with years of significant experience and who should be required to maintain an active role in his professional activity. One of the stumbling blocks to finding such a head or other professional qualified staff is the fact that most contemporary leaders in the field do not possess the doctorate degree and on that basis alone are not acceptable to college and university administrators. However, it must be remembered that other heads of academic programs without the doctorate have quite successfully espoused, developed, administered, directed, and taught programs in our finest colleges and universities because of the paucity of qualified professionals with doctoral degrees in the field. We have the shining example of the first curriculum in Criminology ever to be offered at the University of California whose first Director was Professor August Vollmer. Professor Orlando W. Wilson and Professor Joseph D. Lohman followed successively as Deans of this school in which the degree of Doctor of Criminology is offered. All three men have served in a distinguished manner as administrators and educators, yet none has possessed the doctorate, himself. They have been outstandingly successful because they have been qualified by virtue of combinations of training, professional experience, and leadership in the field.

It is clear therefore that future training programs in Criminalistics must be headed by professionals

in the field regardless of the attainment of academic degrees.

After solving the training problem, in *Looking Forward* to ministering to the needs of society in the field of physical evidence, one must take an inventory of other basic needs in order to see what they are.

This inventory begins with the breadth of the practice of general criminalistics. A consideration of the scope of scientific or physical evidence problems that must be engaged will lead to these finite areas:

1. *Drink and Drug-Influenced Driver Enforcement.* Here there is a need for tests of physiological specimens to determine the amount of alcohol present and the meaning and interpretation of test results. Developing out of this area is the need for cognizance of the drug problem, for many drinking driver cases turn out to be drug or drug plus alcohol cases. The entire nation is plagued with an increasing number of these cases. Programs of evidence gathering in such instances are a constant challenge to Criminalistics operations everywhere. These programs must integrate technical, operational, logistical, and administrative methods in the fullest sense. The liaison with law enforcement ranges from training the patrol officer to educating the county prosecutor. The total effort required here must be intensive and extensive.

2. *Obscure and Violent Death.* Determining cause of death as to homicide, suicide or accident is ultimately the function of coroner or medical examiner. But the basis of and the pathway to that ultimate decision can often be spelled out by the Criminalistics Operation. The employment of all of its available resources is often called for in these cases. The stakes are high. Man's life and liberty are on the balance pan of the Scales of Justice in homicide determinations. Of no less importance is the necessity to develop full and accurate information which can differentiate *accident* from *suicide*. The consequences of an error in such a determination can be very costly or tragic to a family.

3. *Burglary, Armed Robbery, Assault, Sex Offenses.* These typical felony cases often involve much physical evidence of a microscopic nature. The training of detective personnel should include an appreciation for the presence of the microscopic environment. Here we find transfers of this minutiae by physical contact. The identification

of transfers of trace evidence leads to connecting the perpetrator with the crime. Examples include hairs and fibers, tool marks, paint, glass, soil, shoeprints, latent fingerprints, paper, ink, blood, firearms and ammunition components, and many other objects of physical evidence.

4. *Narcotics, Drugs, and Poisons.* These chemical compounds have evidentiary value in the form of proprietary dosage forms, residues in needles and syringes, and extracts from biological samples such as blood, urine, and other tissue. Recent changes in the law which limit the judicial use of confessions have caused an enormous increase in the number of marihuana, heroin, and morphine cases which must *now* be subjected to laboratory examination.

5. *Fire Investigation.* Fire cases represent a special category of investigation in which the full resources of a Criminalistics Operation can be employed. Because of insurance issues which arise from fires, there is an important aspect to civil litigation in this area. These cases involve an evaluation of potential sources of ignition, spread, intensity, and duration of a fire. Significant physical evidence concerning the source of ignition may be located and identified. Sometimes it can be identified succinctly with the perpetrator of arson.

6. *Traffic Accident Investigation (a Neglected Area).* Collision investigations constitute an area of neglect in most jurisdictions. The frequency and seriousness of collisions, and the overall impact of resulting damages and litigation upon society has never been measured. The frequency of this type of work requested from scientific crime investigation laboratories is very small compared with other kinds of evidence. Physical evidence from crashes lends itself to useful study by existing criminalistics techniques. Only the most aggressive investigators ask for help in these cases. In civil litigations there is an acute interest in this kind of evidence. However, if the material is not collected during the police phase of investigation, the opportunity for evidence gathering is lost for any later consideration.

7. *Liasion with Commercial and Other Governmental Sources.* There are many sophisticated instrumental methods of analysis which the average small laboratory cannot possess because of economic limitations. These may include infrared spectrophotometry, X-Ray diffraction analysis, electron probe, neutron activation analysis, atomic

absorption analysis, mass spectrometry, and others. The criminalist must therefore be sufficiently knowledgeable and in touch with methods not available in his laboratory so that they can be utilized by contract when needed. This calls for a concept of operations to be developed with budget backing so that analysis by liaison can be invoked on short notice.

8. *Consulting.* A vast resource is available to the field investigator and attorney through the pool of knowledge which is available to him in the local criminalistics operation. By personal contact and by telephone, the informed investigator can amplify his own knowledge and ability by constant requests for advice on technical matters. This service can be of immense value to prosecutor and field investigator alike in both early and final phases of a case. It is a service which is infrequently tapped and which has potential for development in the future through better means of communication. An awareness of the extent of knowledge available from the criminalistics operation needs to be developed in agencies to which this service can be valuable.

9. *Technical Photography.* Highly specialized photography which is indigenous to the work of criminalistic laboratory is called Technical Photography as contrasted with the routine work of the commercial photographer. By this means, the technique of identification is accomplished with: shoeprint transparency overlays, infrared revelations of unseen details and unseen ultraviolet light images. Small objects and microscopic objects are effectively photographed and minute evidence is delivered to the eye of the layman. As important as any crime laboratory work is the demonstration of conclusive scientific evidence. Conclusions without adequate visual presentation often lose their strength. Criminalistics Operations of the future need to master the process of visual education through photographic and other forms of presentation.

As we Look Forward, we foresee in logical order:

1. The delineation of a geographic or jurisdictional area of need.
2. A need for careful analysis of the scope of services to be furnished to this area, taking into account expected growth in total services over a period of time.
3. A need for an estimate of the necessary equipment, staffing, and work space required to

fulfill the requirements of the scope of service.

4. A need for development of educational facilities and a program to meet staffing needs.
5. A need for a determination of the method of financing and prorating of costs to using agencies.
6. A need for the establishment of a personnel program which will be rewarding to professional personnel in terms of career development and will include an opportunity for professionally independent operations, which will in turn stimulate individual ingenuity and be rewarding in terms of professional results.
7. A need for a method of selection of key personnel and the implementation of the program.

The sophisticated instruments of the Space Age are by nature expensive beyond the budget limitations of the average city or county laboratory. Likewise, technician specialists are required for their operation. Even if available in central or area support facilities, any work submitted for examination to Neutron Activation Analysis, Electron Probe Analysis, Electron Microscopy, and Mass Spectroscopy Analysis must first have the benefit of discovery, screening, isolation, and preparation for analysis by these highly specialized instruments by a Criminalist. Following testing, the Criminalist must make the evaluation of results, taking into consideration the investigative aspects of the case as well as the law problems. In short, the application of advanced technology to criminalistics depends upon a well grounded Criminalist.

Therefore, in *Looking Forward* our efforts would be best placed by capitalizing upon our newer technology in combination with an educational center or institute. The amalgamation of a central teaching program with a center of technology in Criminalistics would provide a continuous flow of knowledge which has been gleaned from experiences to date and would be a part of the implementation of the modern Criminalistics Operation. The future objective should be to consolidate all of this available knowledge into a prototype operation of general criminalistics followed by the application of the prototype to geographic areas of need.

When that objective has been accomplished, the script will be available for Act II of this drama.