

# Foreword

In an increasingly complex world, the fields of science, engineering, and technology advance at an ever more rapid pace. At the same time, the means by which crimes may be committed have become more sophisticated, with greater capacity to inflict harm. Scientists, as professionals in their respective fields, are dedicated to discovery, with intellectual curiosity driving their research, as well as motivation to improve the quality of life for all of humanity. Unfortunately, just as in every walk of life there will be a malicious few who will work in an opposite direction, namely to do harm to their fellow human beings for whatever reasons, a maladjusted mind will justify. An example of a perverse usurpation of science occurred at the beginning of the 21st century in the form of mailings of the anthrax pathogen, *Bacillus anthracis*, in an unprecedented biological attack.

From the anthrax mailings, with their disastrous impact on human health, society, and the economy, has developed the entirely new discipline of microbial forensics. Few are aware of this development, especially of its significant value behind the scenes in tracking down perpetrators of what might be termed "high tech crime," namely those who employ a biological weapon.

My experience with the anthrax attacks was personal in that I served as Director of the National Science Foundation at the time the event occurred. Because my training had been in microbiology and molecular biology, I was able to bring to bear the needed science and scientists who had the capability to assist in analyses of evidence from this tragic event. With colleagues from all of the relevant agencies, including the National Institutes of Health, the Department of Homeland Security, the Department of Defense, the Department of Justice, and the Central Intelligence Agency (CIA), we were able to provide the Federal Bureau of Investigation (FBI) with advice and assistance, as appropriate, in their task of tracking the source of the biological material used in the attacks. We were, in effect, serving as midwives to this new discipline.

Interestingly, the origin of microbial forensics, as a disciplinary activity, traces to the foresight and pioneering efforts of colleagues at both the FBI and the CIA. The need for microbial forensics certainly heightened with the anthrax mail attacks, and development of the field of microbial forensics since has been impressive, especially so through the cooperation of government agencies in circumscribing the vision and the mission of microbial forensics. Scientific tools and practices

were employed to determine the perpetrator of the bioterrorist act and, at the same time, work was done to ensure that innocent individuals would be protected from unwarranted suspicion. Many contributing to the first and second editions of this book were among those who joined in the scientific collaboration and contributed to the maturation of microbial forensics. During the years of the investigation, scientific meetings were organized by various organizations, including the American Academy of Microbiology (1) and the Cold Spring Harbor Laboratory–Banbury Center (2–4). A meeting of the Scientific Working Group on Microbial Genetics and Forensics also was hosted by the FBI (5,6).

Clearly, there is now a shared vision from which the field has evolved and continues to mature, illustrated by the recent National Research and Development Strategy for Microbial Forensics prepared by the National Science and Technology Council and Executive Office of the President (7).

The extraordinary growth of microbial forensics is articulated in this updated volume. I am pleased to have played a part in the emergence and maturation of this very important field of science and to have had the honor of working closely with my dedicated colleagues. I share the sentiments of my friends and colleagues that the science of microbial forensics will serve humankind in ways both beneficial and humanitarian now and in the future.

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