

Preface

“If there is one thing the history of evolution has taught us it’s that life will not be contained. Life breaks free, expands to new territory, and crashes through barriers, painfully, maybe even dangerously.”

– Dr. Ian Malcolm, “*Jurassic Park*” (1993)

“The most merciful thing in the world, I think, is the inability of the human mind to correlate all its contents. We live on a placid island of ignorance in the midst of black seas of infinity, and it was not meant that we should voyage far. The sciences, each straining in its own direction, have hitherto harmed us little; but some day the piecing together of dissociated knowledge will open such terrifying vistas of reality, and of our own frightful position therein, that we shall either go mad from the revelation or flee from the deadly light into the peace and safety of a new dark age.”

– H.P. Lovecraft, “*The Call of Cthulhu*” (published 1928)

Howard Phillips Lovecraft was an American author of horror, fantasy, and science fiction. His major inspiration and invention was overt cosmic horror, and he is often regarded as one of the most influential horror writers of the twentieth century, exerting widespread and indirect influence, and frequently compared to Edgar Allan Poe. The above quotation begins the story and could be applied to more modern times, nearly 80 years since the story’s publication in “Weird Tales.” Of course, it is easy to argue that the sciences have no longer “harmed us little” with such developments of nuclear bombs and other weapons of mass destruction (WMDs). Among the WMDs (as the media enjoys calling them) are those of the biological variety. It is these agents that serve as the basis of this textbook.

“*Beyond Anthrax, The Weaponization of Infectious Diseases*” has been in development for a number of years and is meant as a primer for clinicians and epidemiologists on a variety of agents, organisms, or toxins, which are generally considered at the forefront of potential use in a biological attack from a rogue nation or radical group. In the aftermath of the September 11 World Trade Center attacks, a number of cases of inhalational anthrax were diagnosed in the eastern United States, specifically the New York City metropolitan area and Washington, DC, although the first case was diagnosed in Florida. The finding

of a disease such as anthrax outside of its general geographic area with an uncommon presentation (inhalation rather than cutaneous exposure) is the factor that raises the red flag of a possible bioterrorist attack. In this case, the spores of *Bacillus anthracis* were found to have been weaponized to increase infectivity and placed (by a person still unknown) in the mail. The letters, by processing in post office facilities or by opening at the final destination, delivered a deadly message producing inhalation anthrax in 11 individuals with a 45% case fatality rate [1]. Much information has been published regarding anthrax as a biological agent, and for reasons of space and minimizing repetition regarding this disease, the text will start beyond anthrax and discuss the remaining Category A agents as well as delve into a number of the diseases placed in Category B. It will suffice to say, however, that the anthrax incident has demonstrated what terrorism really does in getting a huge bang for its buck; that is, for a small number of cases, the outbreak caused major disruption to much of the fiber of this country changing some of it forever.

Before going forward, we must take stock of reality and not just jump, willy-nilly, on to the Lovecraftian slippery slope of the inevitability of something evil occurring fashioned by the hand of some bad person. No doubt, the possibility of the use of biological warfare has always existed millennia before the acceptance of the Germ Theory, a short century or so ago. Many of these events are discussed in Stuart Handysides' introductory chapter on the history of the topic. It is, to this point, useful to refer to the John Snow [2] Memorial Outbreak Scoreboard during the last decade or so. In doing so, our evil task doers are clearly trounced in overall numbers of cases and outbreaks by Mother Nature (MN), the world's most devious bioterrorist.

Although aided by humankind, MN has fashioned newly recognized diseases such as SARS (severe acute respiratory syndrome) [3] like a Golem out of the virtual molecular mud and has facilitated diseases such as monkey pox [4] and West Nile virus [5] unknown on a continent to appear there.

Furthermore, she has assisted in the production of multidrug resistant organisms [6,7] in a healthcare arena where fully sensitive ones had been present. Additionally, and certainly last but not least, MN continues to percolate new strains of influenza A including the current H5N1 avian strain [8] that threaten to win the primary race for next pandemic candidate. Although the diseases forthcoming in this text may be formidable opponents in the future, it remains a solid wager that infectious disease clinicians, epidemiologists, and public health personnel will have their hands soiled with many more threats than that are contained here.

Following the Stuart Handysides (former Medical Editor of Communicable Disease and Public Health) chapter on the history of biological warfare, the text has five chapters regarding the Category A diseases that are (true to the title, beyond anthrax), namely, smallpox, plague, tularemia, botulism, and the viral hemorrhagic fevers. The chapters are written by some of the foremost experts of each field including representatives of the National Institutes of Health, the

Centers for Disease Control and Prevention, and UK's Defense Science and Technology Laboratory at Porton Down. The chapters for the most part contain similar sections including outbreak scenarios, a historical perspective, microbiologic considerations, natural infection with its epidemiology and diagnostic considerations, as well as specific biowarfare issues. Additionally, the chapters discuss both therapeutic and preventative measures and may include infection control, prophylactic drugs, reservoir controls, and vaccinations.

The next part of the text contains chapters dealing with many, but not all, of the Category B agents, selected for overall interest. This includes a chapter on the intentional contamination of food and water as well as ones dealing with melioidosis, epidemic typhus, and some of the biotoxins such as ricin and staphylococcal enterotoxin B. Overall, the organization of these chapters parallel that in those of the Category A diseases. With much more emphasis on the "A" diseases, the inclusion of these entities provides a good source of information for the clinician and epidemiologist.

Following the "B" list are a number of chapters that concentrate on a variety of issues that are important in any contribution in the biowarfare arena. All of these have direct applications to natural outbreaks and epidemics, and they include Public Health Infrastructure, Public Health Law, Public Health Surveillance, Mental Health Management, as well as a chapter regarding the role of the media in outbreaks written by David Brown, a physician who has written regularly for the *Washington Post*. The text ends with an overview of rapid detection of pathogens and a final chapter discussing agroterrorism, that is, biological attacks on the potentially very vulnerable food-producing systems of the world. Biowarfare aimed at flora and fauna rather than on humankind, although not as often written about, are ripe areas for further discussions and protective measures.

In several of the original versions of the "Table of Contents," several other chapters were envisioned, but as the text matured, they were not included. The editors thank those who contributed additional but unused material.

We hope that the topics contained here, as biowarfare events, remain purely didactic exercises and not issues that interject themselves into clinical medicine.

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Lutwick, L.I.; Lutwick, S.M. (Eds.)

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