

Webcast: Exploring 9/11 – The World Before and After

Supplementary Materials

Paul Lioy examines environmental issues in the aftermath of 9/11.

The Speaker

Dr. Paul Lioy is a professor and the Vice Chair of the Department of Environmental and Occupational Medicine at the Robert Wood Johnson Medical School. He is also the Director of Exposure Science at the Environmental and Occupational Health Sciences Institute at Rutgers University and author of the book, *Dust: The Inside Story of its Role in the September 11 Aftermath*.

Review Questions

CHAPTER 1: *Dr. Lioy describes his experiences on 9/11 and how he became involved professionally in the aftermath.*

1. Describe the field of Environmental science. What disciplines and subjects does it integrate?
2. When did Dr. Lioy begin to view 9/11 and its aftermath in lower Manhattan through the lens of Environmental science?

CHAPTER 2: *Dr. Lioy walks through his professional and academic trajectory and summarizes the different phases of exposure in the days and weeks after 9/11.*

1. Dr. Lioy shares a “fundamental scientific error” he made during the sampling process. What is he referring to and what were the repercussions?
2. What are the five phases in Dr. Lioy’s exposure timeline? Describe their progression and why the timeline is important to health scientists.

CHAPTER 3: *Dr. Lioy examines the characteristics of the fires, their emissions, and the WTC dust.*

1. What phases of dust exposure were not able to be captured by scientists? Why?
2. What comprised the “famous WTC dust”?
3. What were two ways that the movement of the rescue and recovery vehicles exacerbated the environmental problems?

CHAPTER 4: *Dr. Lioy describes the features and health effects of the WTC dust.*

1. Why did scientists begin to study the size of the dust particles? What made the dust unique?
2. What other primary characteristic of the dust did they study, and what did they discover?
3. What are the symptoms of the “WTC cough”?

KEY REFERENCES

Aerosol

A combination of gases and particles. In the days following 9/11, a mixture of dust from the rubble, air, and gas vapors from the burning fires created an unhealthy aerosol in and around ground zero.

Asbestos

A naturally occurring mineral widely used in 20th century building and construction, it has been found to cause a range of health issues. When the North and South Towers collapsed, many feared the prevalence of asbestos in the dust that covered much of lower Manhattan.

DNA

Shorthand for Deoxyribonucleic acid, DNA acts as the unique genetic blueprint for nearly all living organisms. Scientists unsuccessfully examined the dust from ground zero for identifiable DNA of those killed.

Exposure-Response Relationship

Describes the change in health of an individual or population caused by different levels of exposure to a chemical over time. This relationship helps scientists determine safe and hazardous levels of certain chemicals.

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Review Questions (continued)

CHAPTER 5: *Dr. Lioy discusses issues around the use of respirators at the site and describes the search for DNA in the WTC dust.*

1. Discuss the risk/benefit Dr. Lioy describes around respirators in the first moments after the collapse.
2. Why were very few human remains found following the attack? Why was no DNA found in the dust?

CHAPTER 6: *Dr. Lioy explores the extent and clean-up of the interior dust found in the surrounding neighborhoods.*

1. Why was a systematic approach to dealing with the interior dust so difficult?
2. Why was there frustration among downtown residents concerning the dust? In what ways were the apartments finally cleaned?

CHAPTER 7: *Dr. Lioy discusses the residual exposure issues for the downtown area, the uniqueness of the WTC dust, and 9/11's lasting effect in other fields.*

1. Why can't Dr. Lioy be certain that we fully understand the extent of the health repercussions from ground zero?
2. How have the lessons learned from 9/11 affected new areas of scientific examination and investigation?

KEY REFERENCES (continued)

National Institute for Occupational Safety and Health (NIOSH)

The federal agency responsible for conducting research and making recommendations for the prevention of work-related injury and illness.

Super Coarse Particles

Particles larger than 10 micron (0.00001 meters) across and the cause of the upper respiratory infections found throughout those working at ground zero in the aftermath of 9/11. These particles are much larger than normal dust particles, but comprised 98% of the dust found at ground zero.

Questions for Further Discussion

This is Dr. Lioy's first book written for the general public. Why do you think he chose this subject for his initial effort?

Dr. Lioy states that one of the fundamental lessons of the 9/11 environmental response is the need to "think outside the box." Where else was this lesson learned as a result of 9/11? Has the lesson been heeded?

He goes on to liken implementing changes in our government's disaster response to "turning the Titanic." What does this analogy mean? Is it fundamentally at odds with "thinking outside the box"? Can you find examples both confirming and conflicting with this statement?

There have been a range of health issues for many of those working at ground zero in the days after 9/11. Many of those who became sick were volunteers without health insurance. How would you handle those cases? Are volunteers who lent their time and support owed compensation for health issues arising out of that work? Why or why not? What did the government decide to do? Do you agree with the solution?

Recommended Resources

DePalma, Anthony. *City of Dust: Illness, Arrogance, and 9/11*. (FT Press, 2010)

Lioy, Paul. *Dust: The Inside Story of its Role in the September 11th Aftermath*. (Rowman and Littlefield, 2010)

Lioy, Paul. *Interview with Leonard Lopate*. <http://beta.wnyc.org/shows/lopate/2010/mar/05/please-explain-dust/> (WNYC, 2010)