

**Chapter 15 Study-Discussion Guide
Honors Science**

Garrett, L. *The Coming Plague-Newly Emerging Diseases in a World Out of Balance*, Penguin Books, 1994.

The following guide deals with Chapter 15 (pp. 528-549) and deals with hantaviruses.

PLACE: Four Corners (Utah, Arizona, New Mexico, Colorado) and the Navajo Reservation in the United States.

TIME: 1993

KEY PEOPLE: **Merrill Bahe**
 Bruce Tempest
 Richard Malore
 Dr. Jim Clark
 Rob Breimen
 Louisa Chapman
 Dr. Jim Hughes
 Dr. Ruth Berkelman
 C. J. Peters
 Dr. Jay Butler
 Joe McDade
 Dr. Joe Hubbard
 Peterson Zah
 Tom Ksiazek
 Dr. Karl Johnson
 James LeDuc
 Peter Jahrling
 Connie Schmaljohn

I. GEOGRAPHIC SETTING

Locate the Four Corners area where the states of Utah, Arizona, New Mexico, and Colorado meet. Also, locate the large Navajo Reservation.

II. DISCUSSION GUIDE QUESTIONS

Page

529-530 1. What did Bruce Tempest, Indian Health Services internist, do that resulted in bringing the deaths of Merrill Bahe and his girlfriend to national attention?

529-530 2. What did autopsies of Bahe and his girlfriend reveal?

- 530 3. What did New Mexico state epidemiologist C. Mack Sewell suggest about the cause of several regional “weird diseases?”**
- 530 4. What did the New Mexico Plague Laboratory find/not find?**
- 530-531 5. What did Cheek find concerning the possibility of toxic chemicals as the cause of the deaths?**
- 531 6. How did weather conditions in the winter of 1992-93 in the Four Corners region figure into the puzzle of the disease?**
- 531 7. What was found in Merrill Bahe’s trailer home?**
- 531 8. In what way was Cheek careless when checking Bahe’s trailer home?**
- 531-532 9. Who was Rob Breimen? What role did he play after visiting with Cheek?**
- 532 10. As of May 24, 1993, how many people had died?**
- 533 11. What/who were the “P4 workers” at the CDC?**
- 534 12. On May 29, 1993 How did Dr. Jay Butler and the “Forty Experts” begin to clarify the disease situation?**
- 534 13. What were the symptoms of the disease as compiled by the experts on May 29, 1993?**
- 534-535 14. While the May 29 meeting was occurring in Albuquerque, NM, another meeting was taking place at the CDC in Atlanta, GA. What were the conclusions of the CDC meeting?**
- 535 15. The local press in the Four Corners area picked up on the story of the deaths on the Navajo Reservation. What “cultural” problems arose due to the aggressive press activities?**
- 536 16. The press began calling the disease “Navajo Flu.” What were the results of this label?**
- 536 17. How were cultural issues calmed?**
- 536 18. What clue surfaced as a result of the bountiful pinon pine nut harvest? What other population factor was also high at this time?**
- 537 19. On June 3, 1993, C. J. Peters and his lab group made a major discovery. What was it?**

- 537 20. Why was it important to check out wild animals in addition to using lab animals for screening tests?
- 537 21. Why were there skeptics about the cause of the disease being a pathogen?
- 538 22. Where/when did we originally learn about hantaviruses on a global scale?
- 538 23. During the 1970's eleven types of hantaviruses were identified. In all cases a common carrier/reservoir animal was identified. What kind of animal?
- 539 24. In the 1980's, James LeDuc made a discovery concerning hantaviruses. What was the discovery?
- 539 25. What did LeDuc find among dialysis patients in Baltimore, MD in the 1980's?
- 540 26. What is *Mus musculus*? What is its importance?
- 541 27. What was the mortality rate at Four Corners?
- 541 28. While trapping wild animals the researchers and their helpers needed to be cautious of exposure not only to viruses but to another pathogen (bacteria) which causes _____ and is vectored by _____.
- 541-542 29. Describe the precautions taken as the researchers trapped wild rodents.
- 542 30. What is *Peromyscus maniculatus*? What is its importance?
- 542 31. What did Peters' lab conclude by mid-June, 1993?
- 543 32. What role did genetic studies play in the hantavirus epidemic?
- 544 33. Where were various hantavirus cases detected later in 1993?
- 545 34. What did a hantavirus case in Louisiana and co-evolution have in common?
- 546 35. Why were about half of the victims of hantaviruses American Indians?
- 547 36. Why do so many hantaviruses around the world bear great similarity?
- 547 37. What was the "competition" that caused some problems among researchers?
- 548 38. What's next now that the hantaviruses had been successfully isolated and cultured?

548 39. What were several “old” but overlooked principles we should consider when investigating “new diseases?”

548 40. What did the CDC report in 1994 say?

548-549 41. What happened in Providence, RI in early 1994?

549 42. What was the hantavirus isolated from a person in Rhode Island called?

CONCLUDING REFLECTIVE THOUGHTS

In this chapter we encountered some of the same themes seen in other epidemic studies. Discuss one example to show how the following factors played roles in the hanatavirus epidemic:

Historic

Ethnic/Cultural/Racial

Biological

Modern Technology

Climate/Weather

Politics

Psychology

Geography

Carelessness

Chemistry

Team Work/Cooperation from the following standpoints: a. Professional
b. Cultural

International Focus

Communications