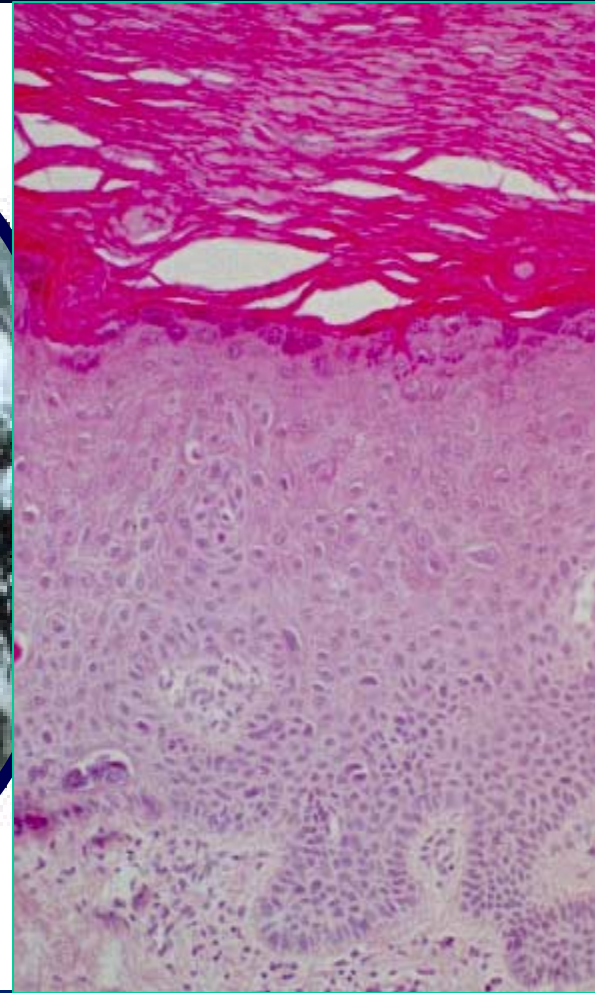


# Medical Geology

The Impacts of Geologic  
Materials and Geologic  
Processes on Animal and  
Human Health



Environmental and health effects of  
toxic elements, metal ions, and minerals

# **Medical Geology:**

## **A 10,000 Year Old Opportunity**

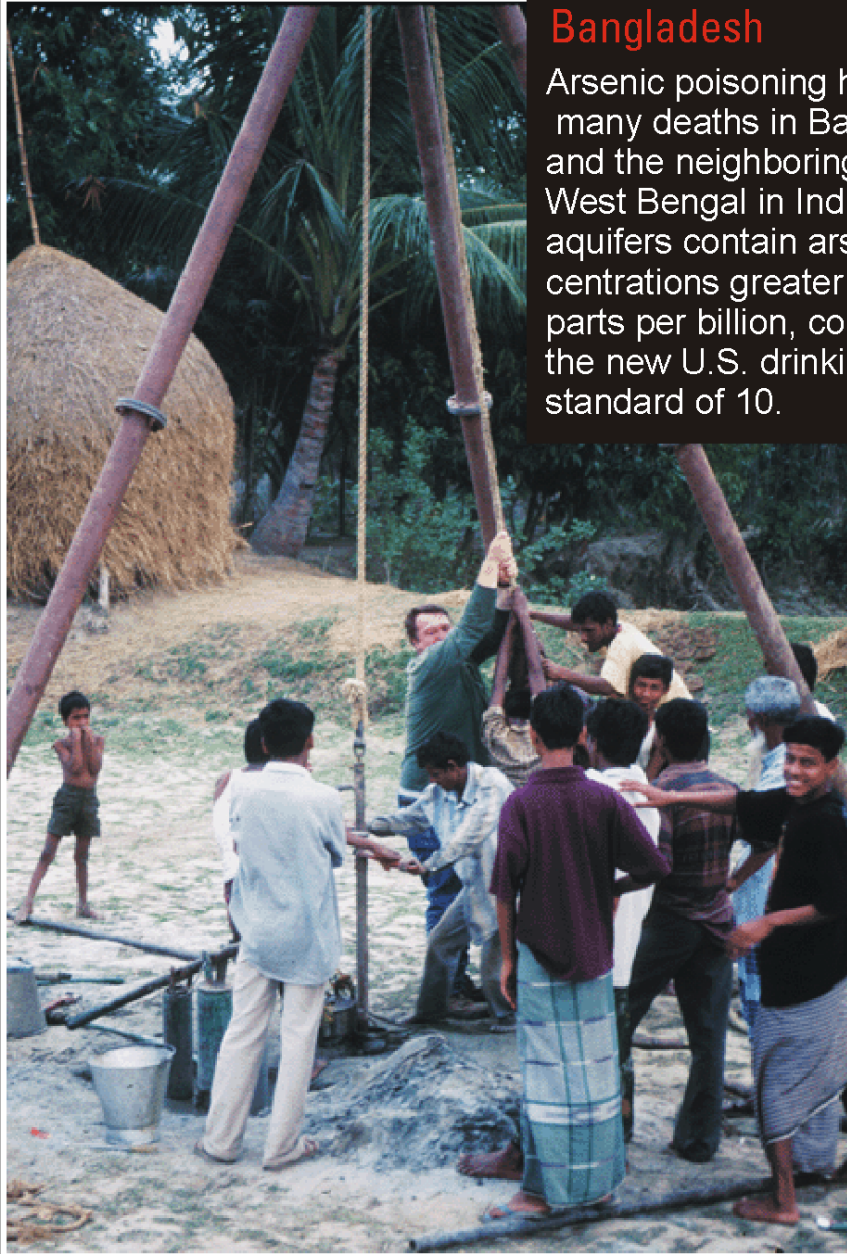






## Bangladesh

Arsenic poisoning has led to many deaths in Bangladesh and the neighboring state of West Bengal in India. The local aquifers contain arsenic concentrations greater than 1,000 parts per billion, compared with the new U.S. drinking water standard of 10.



Local sediment coring technology used by USGS and Geological Survey of Bangladesh to study arsenic contamination.

# Medical Geology-Range of Issues

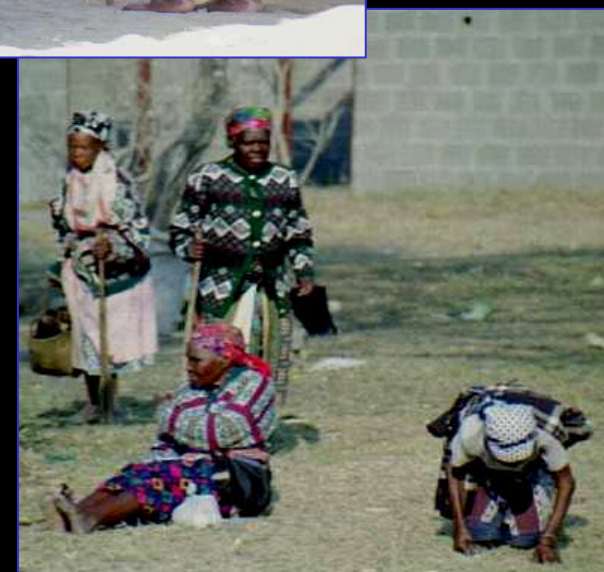
- Trace Element Exposure - As, Hg, F, Se, Zn, Al
- Dust - Asbestos, African, Valley Fever, Silicosis, CWP, VOG
- Radionuclides - Radon, Radium, Uranium
- Organics - VOCs, MTBE, PAHs, Antibiotics, Pesticides
- Microbes, Pathogens - West Nile Encephalitis, LaCrosse Encephalitis, Plague, Hantavirus, Rift Valley Fever, Lyme disease, etc.
- Global Climate Change





# Miseleni Joint Disease

---



# BALKAN ENDEMIC NEPHROPATHY (BEN)



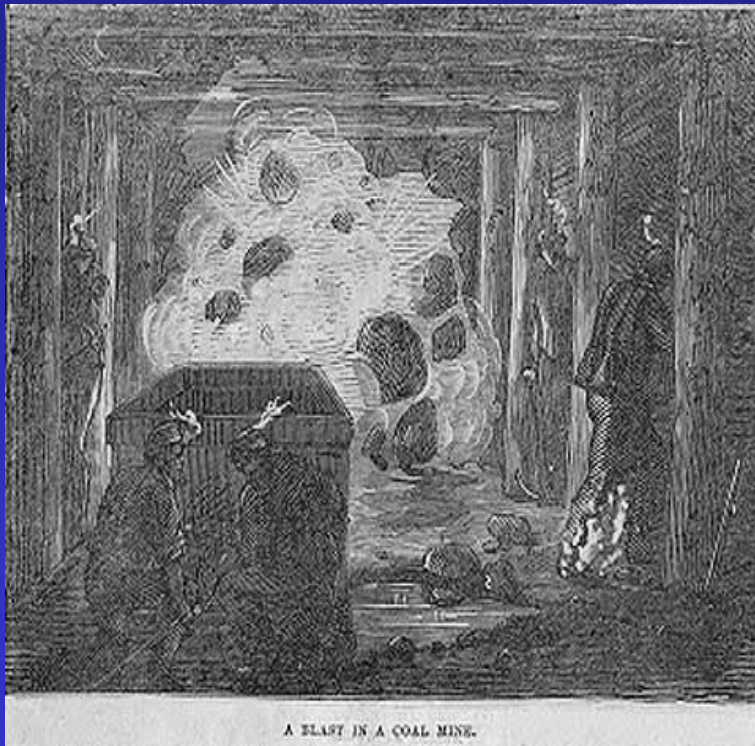
# Valley Fever-Clinical Presentation



◆ 7,500 new cases of Valley Fever occur annually in the U.S.A, with a cost in excess of \$60 million a year.

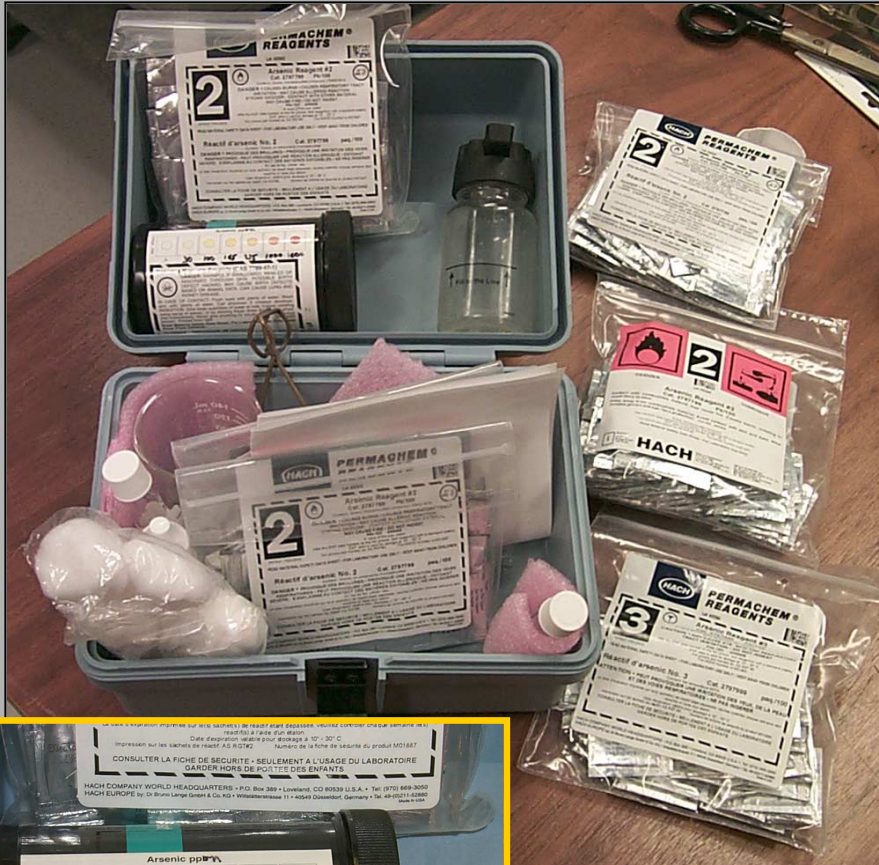
# MINING AND THE HUMAN- GEOLOGICAL INTERFACE

## Historical perspectives



# Arsenic Field Tests

- *Test kit developed in China to identify arsenic-rich coals in the field.*
- *Commercial version (left) being introduced by U.S. manufacturer.*
- *Testing has resulted in closure of "mines" with highest As coal.*



# Environmental Risk Assessment Map of the Slovak Republic

