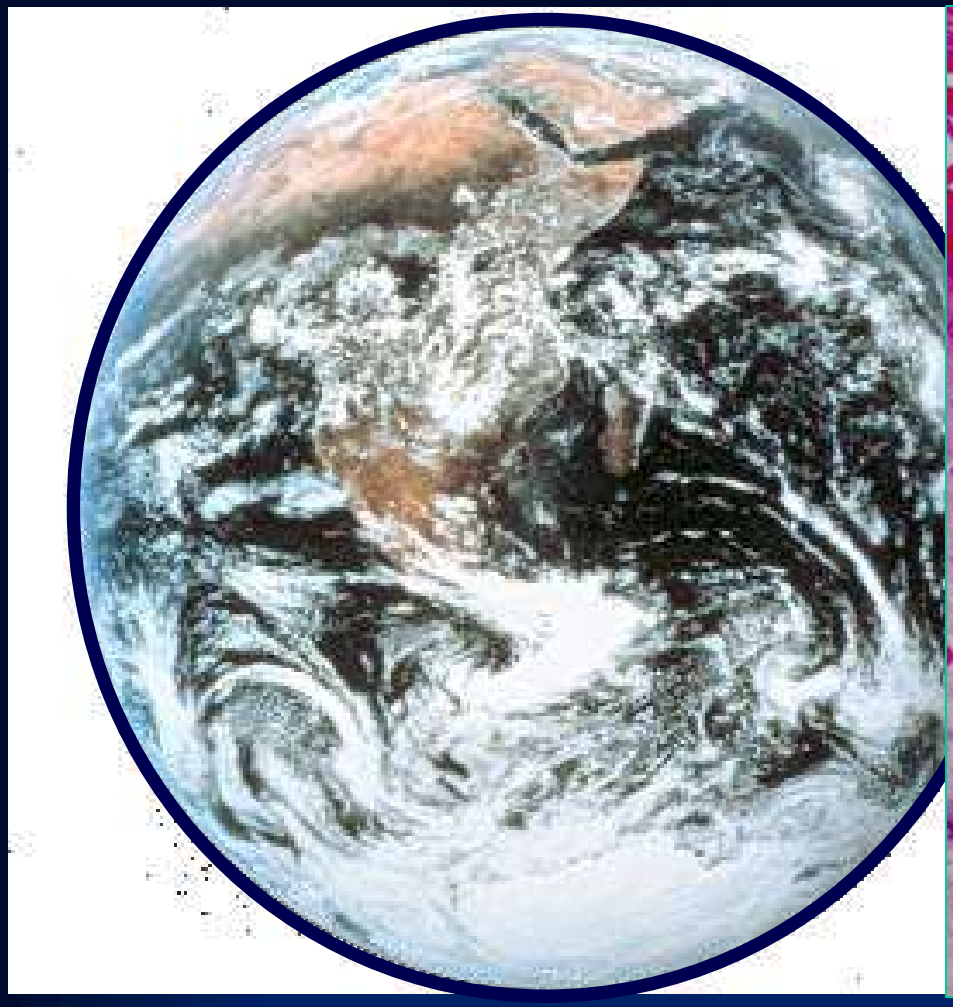
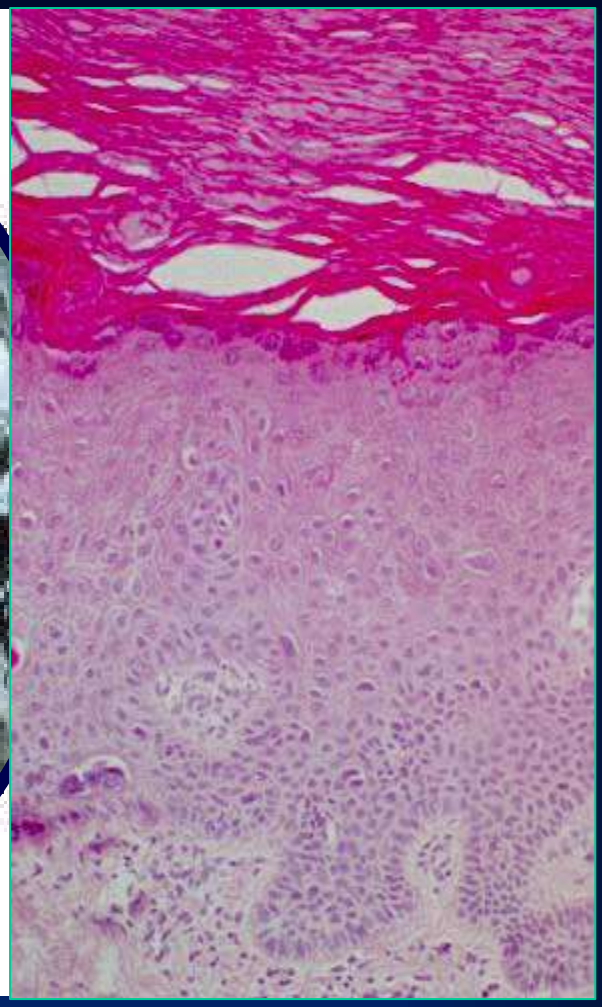
Medical Geology

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

USGS





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

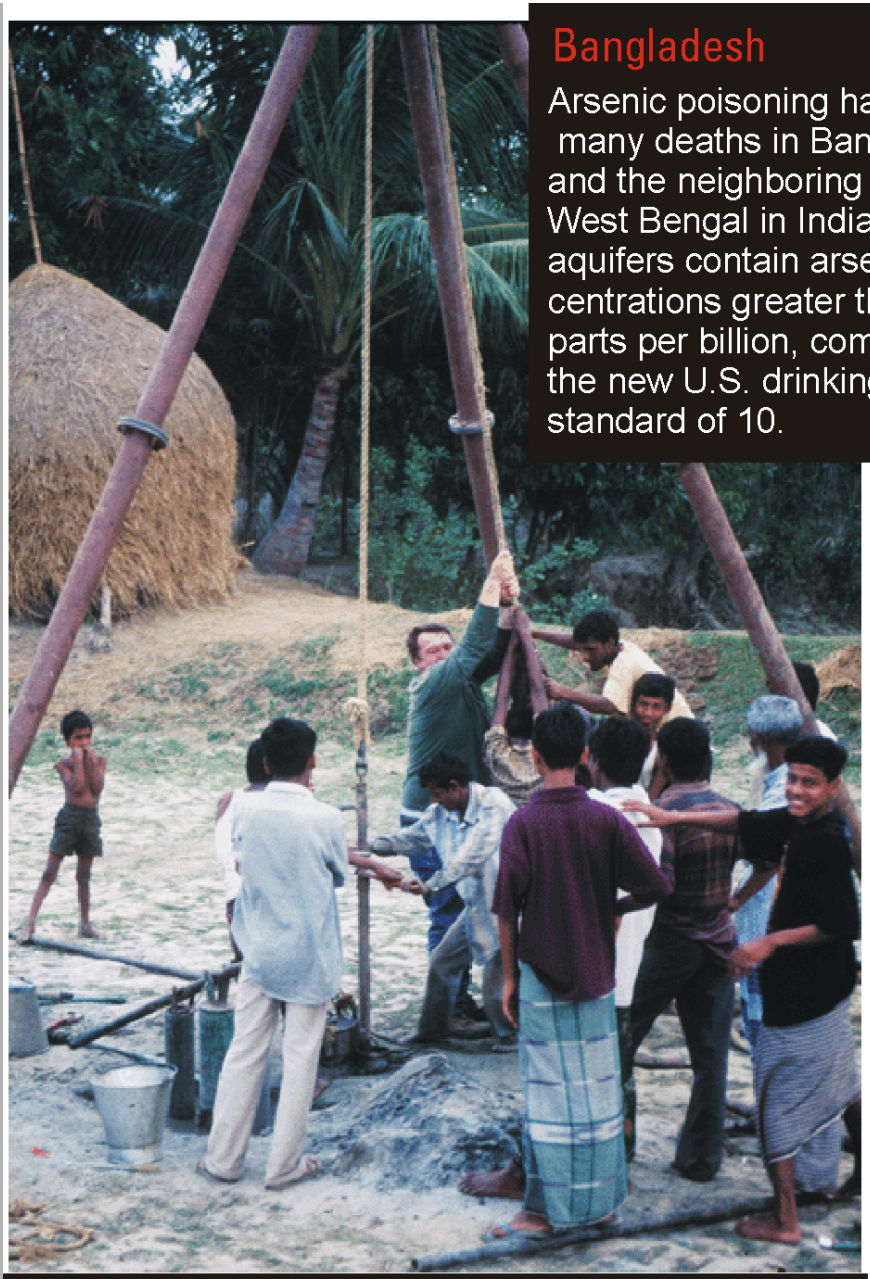
Medical Geology:

A 10,000 Year Old Opportunity

USGS

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

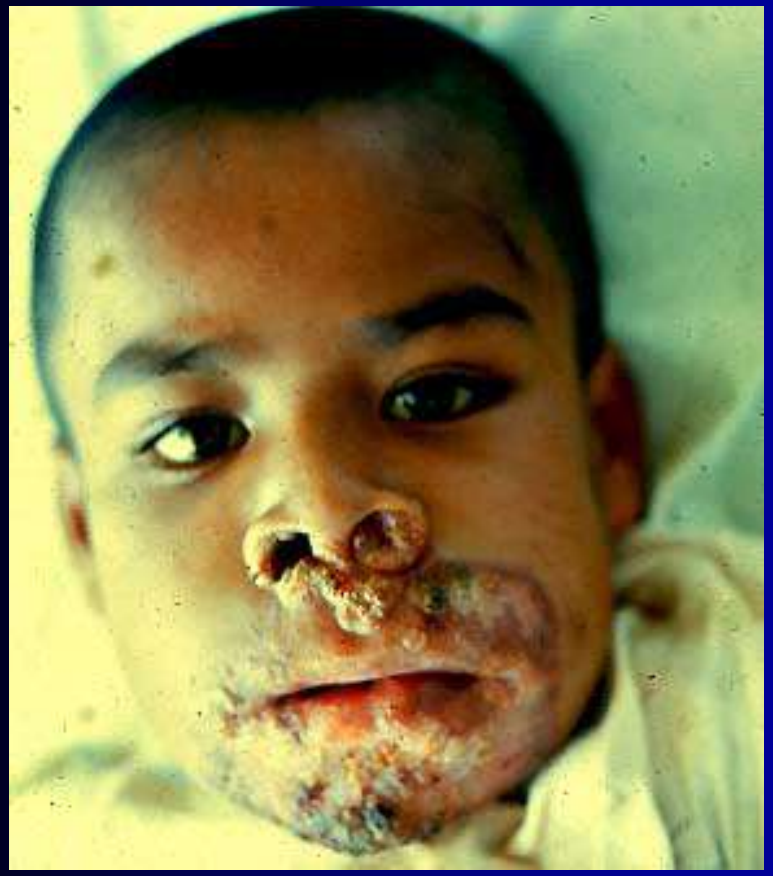
- Trace Element Exposure - As, Hg, F, Se, Zn, Al
- Dust - Asbestos, African, Valley Fever, Silicosis, CWP,VOG
- Radionuclides - Radon, Radium, Uranium
- Organics - VOCs, MTBE, PAHs, Antibiotics, Pesticides
- Microbes, Pathogens - West Nile Encephalitis, LaCrosse Encephalitis, Plague, Hantavirus, Rift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

USGS

Miseleni Joint Disease

BALKAN ENDEMIC NEPHROPATHY (BEN)

Valley Fever-Clinical Presentation

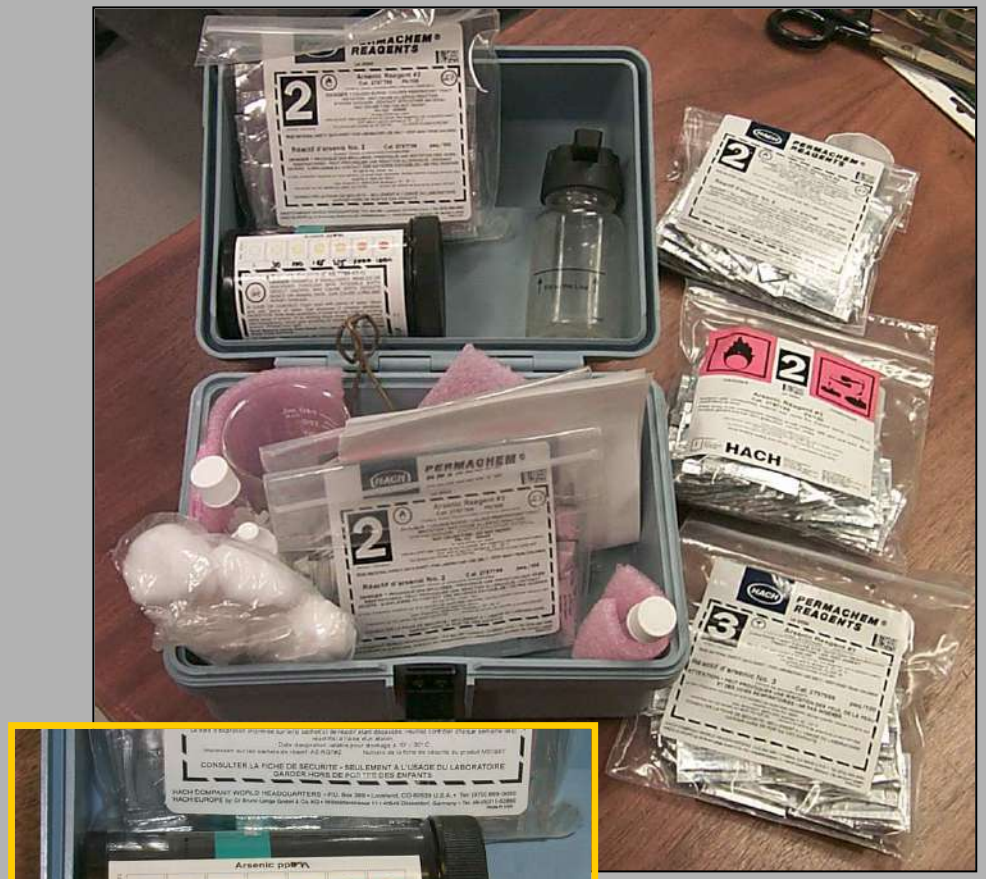


- 7,500 new cases of Valley Fever occur annually in the U.S.A, with a cost in excess of $60 million a year.

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.*

USGS
science for a changing world

pilot area

Environmental Risk Assessment Map of the Slovak Republic