Geology and Human Health
Reading: Geomedicine chapter on Montgomery website

Trace Elements
Hypothetical Dose Response
The Good – Calcium (?)
The Bad – Arsenic, Lead, Mercury and many others

Trace Element Pathways to People
Most “Essential” Elements
A Few Essential Elements

<table>
<thead>
<tr>
<th>Element</th>
<th>Deficiency Effect</th>
<th>Excess Effect</th>
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</thead>
<tbody>
<tr>
<td>Cobalt</td>
<td>Anemia, Anorexia</td>
<td>Cardiomyopathy</td>
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<tr>
<td>Copper</td>
<td>Anemia</td>
<td>Liver Inflammation</td>
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<tr>
<td>Fluorine</td>
<td>Tooth Decay</td>
<td>Fluorosis</td>
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<tr>
<td>Iron</td>
<td>Anemia</td>
<td>Cardiac Failure</td>
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<tr>
<td>Iodine</td>
<td>Goiter</td>
<td>Hyperthyroidism</td>
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<tr>
<td>Lithium</td>
<td>Manic Depression</td>
<td>Neuromuscular problems</td>
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<tr>
<td>Selenium</td>
<td>Liver Necrosis</td>
<td>Birth Defects, Cancer</td>
</tr>
<tr>
<td>Zinc</td>
<td>Dwarfism</td>
<td>Hyperchronic Anemia</td>
</tr>
</tbody>
</table>

Fluoride

Fluorosis in China

Goiter in Sri Lanka

Similar iodine concentrations in soil
But soils in wet areas have high organic matter, which binds iodine
Selenium Deficiency and Excess in Animals

Airborne Hazards - Radon

Airborne Hazards – Asbestos

Fiber in lung
Airborne Hazards – Volcanic Dust

“Geogenic” Contaminants in Water

Arsenic

Green Bay Cone of Depression

“Geogenic” Contaminants in Water

Radium
Hard water 'stops heart attacks'

Drinking hard water may protect against heart disease, researchers have claimed.

Researchers from the Geographical Survey of Finland looked at 19,000 men who had suffered heart attacks. They found for every unit increase in water hardness, there was a 1% decrease in the risk of having a further attack. Writing in the Journal of Epidemiology and Community Health, the researchers said the findings explained regional variations in heart attack rates.