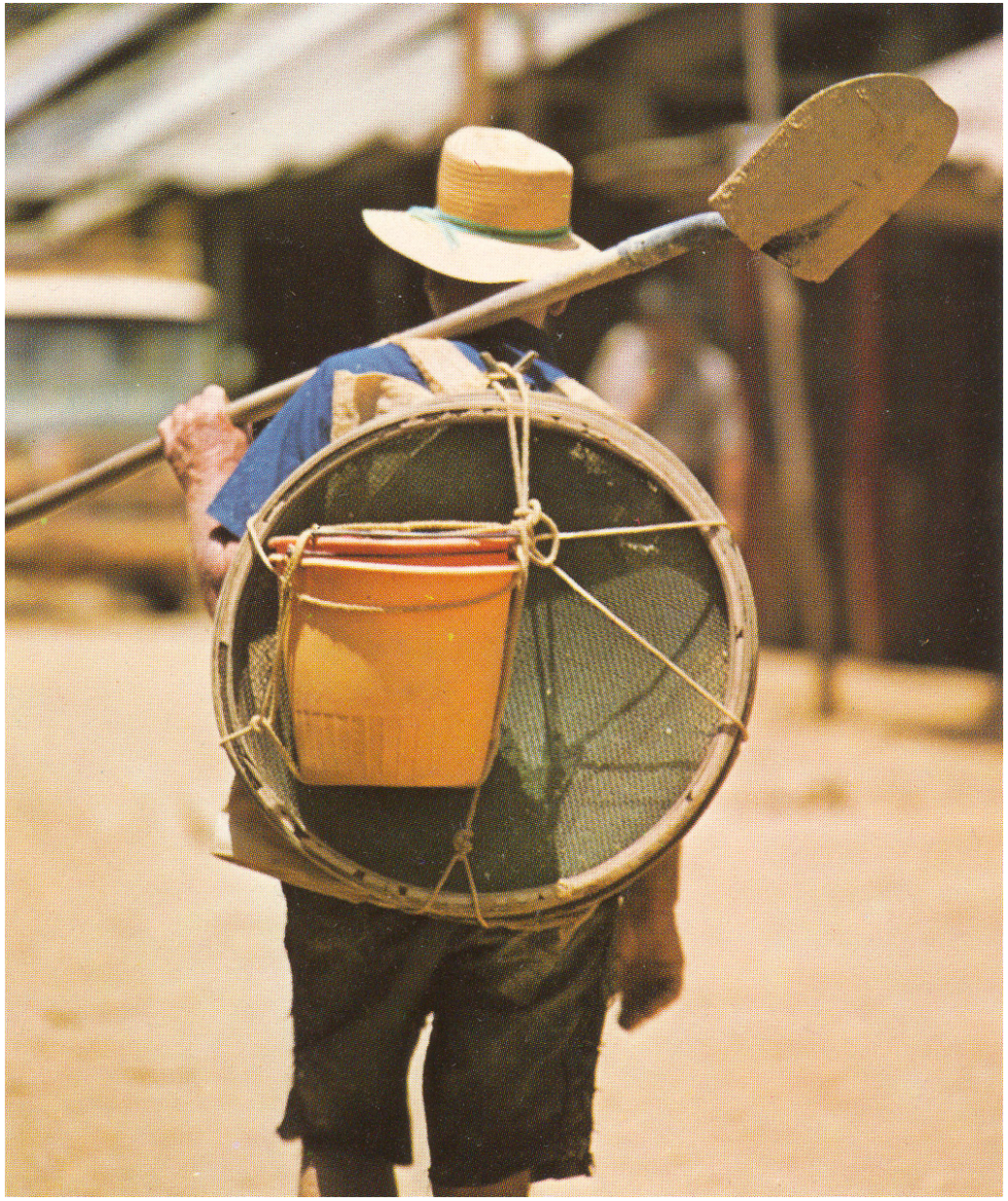
Prospecting and Mining

Looking for gems and precious metals is called prospecting

- Prospecting goes on everyday.
- Any earth material may be the subject of prospecting.
- It is hard work and can be dangerous
- The work is often done in inhospitable places
- You could get rich

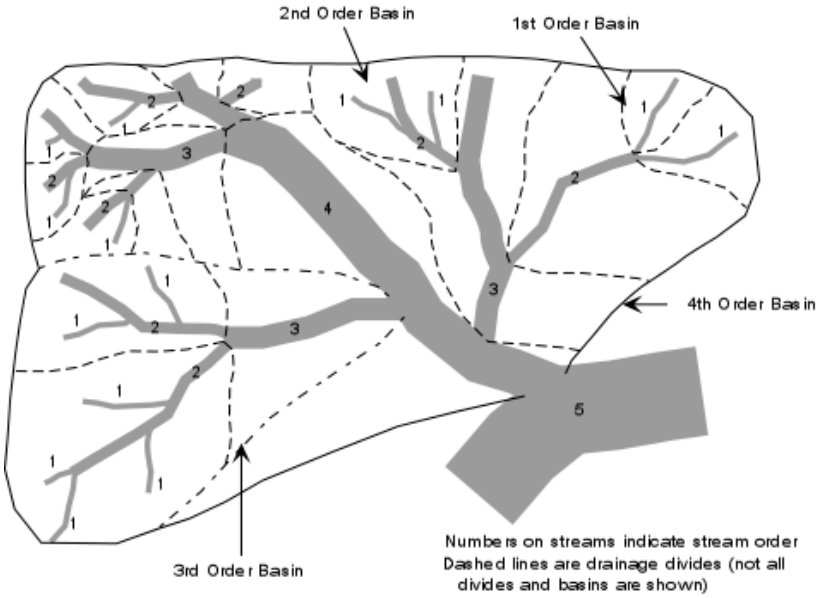


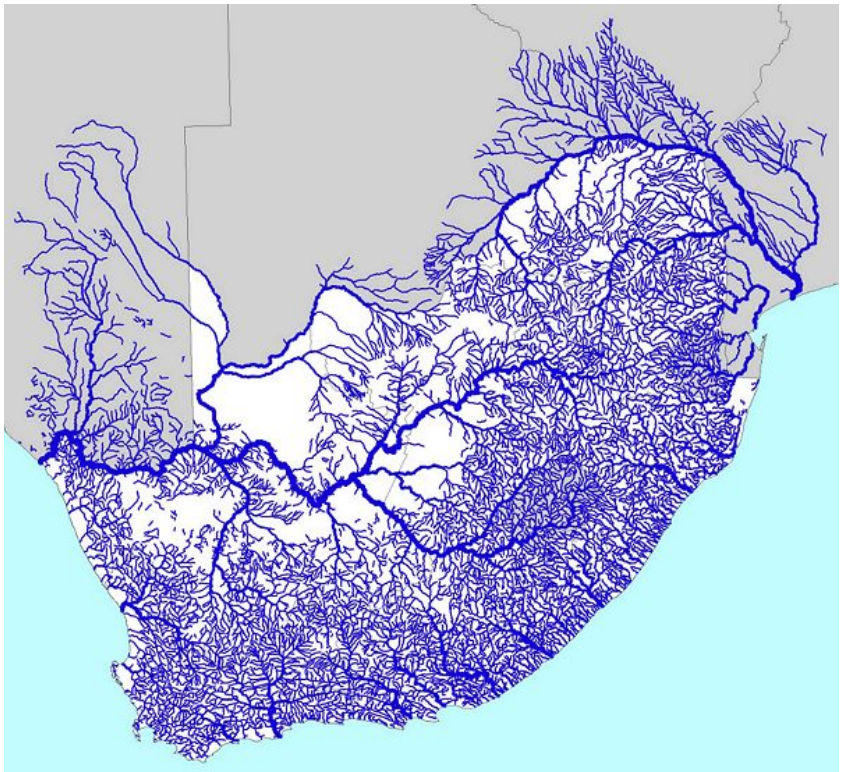
Alluvial Prospecting

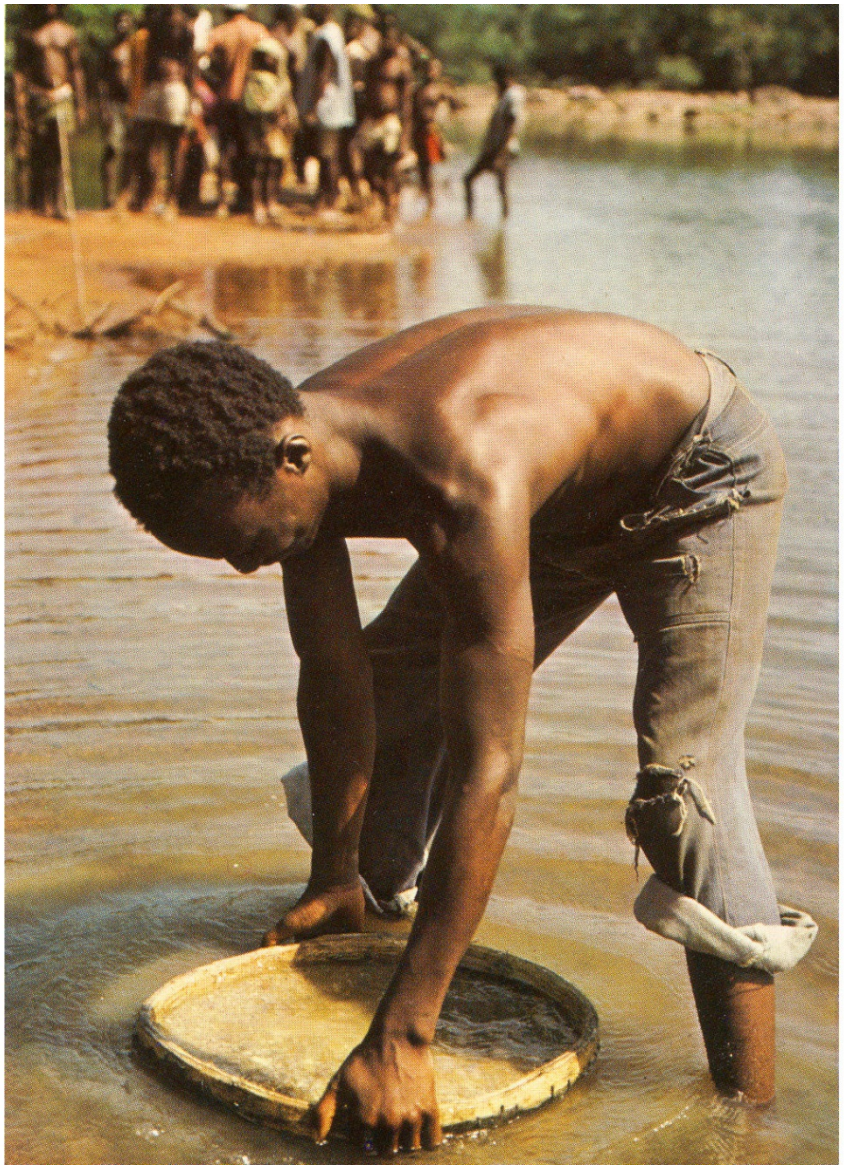
- Alluvial prospecting is done in streams & rivers.
- Alluvium is the material moved by streams and rivers.
- Water can transport material for great distances down the water’s course

Drainage of River Systems USA

River Basins





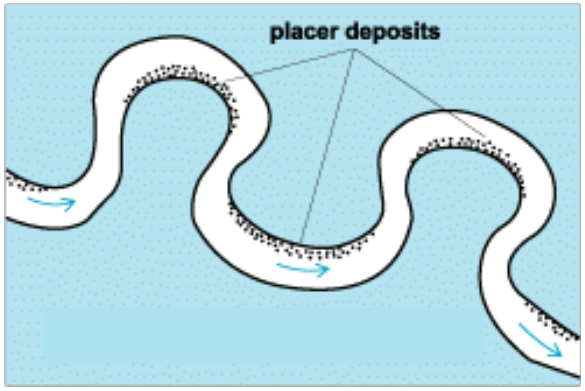


Diamond Octahedron

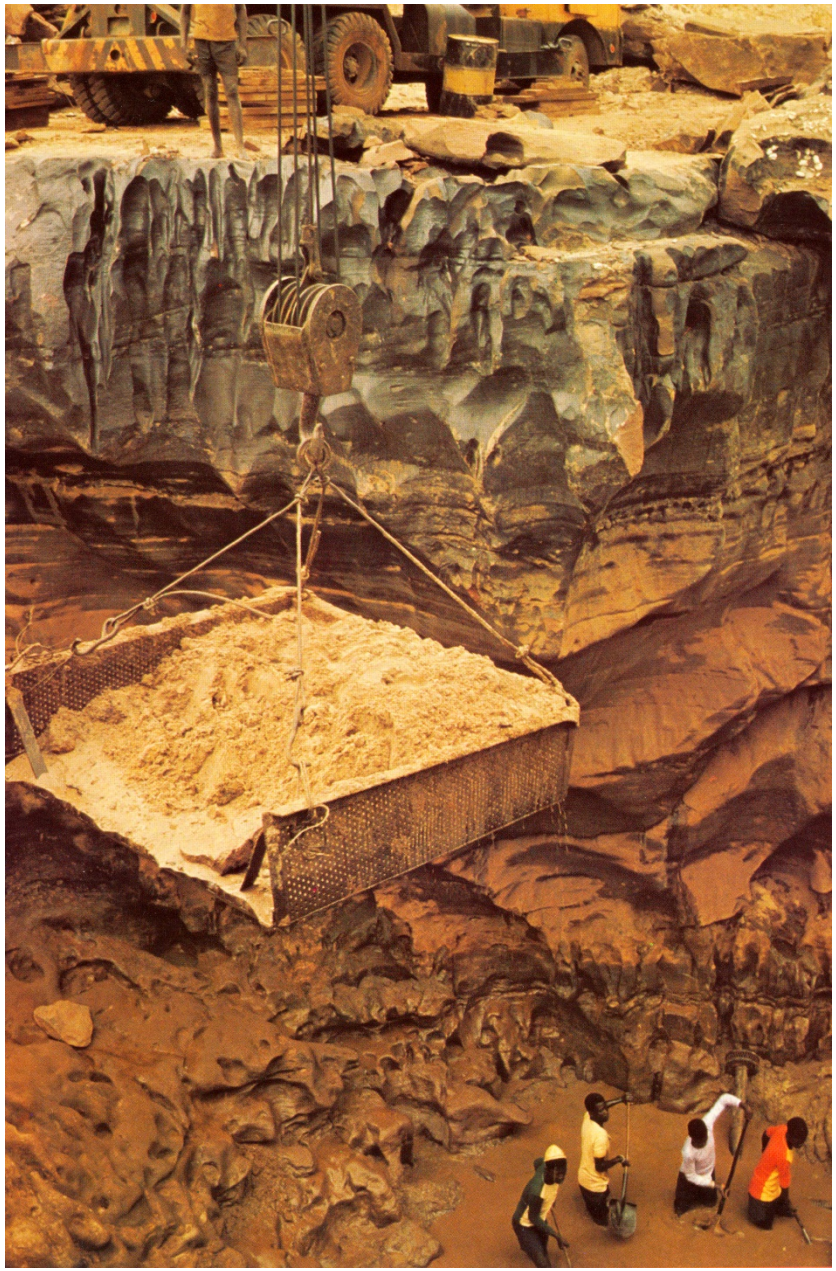
Placers

- Gems and precious metals usually accumulate in placer deposit because of their specific gravity (G).
- Placers form on the inside bend in a river as water slows on a curve.
- Rivers change their course, old channels are abandoned and covered. Some placers are thus not in the river any more.

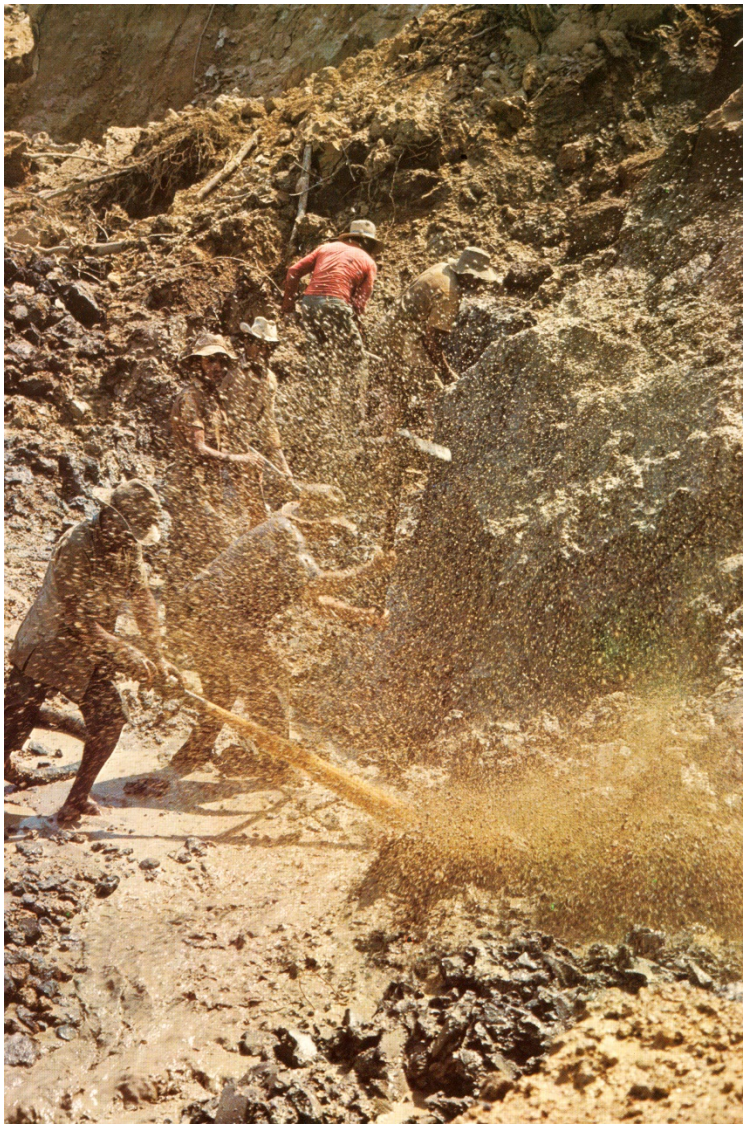
Meandering Stream



1.8 Billion year old pebbles and diamond

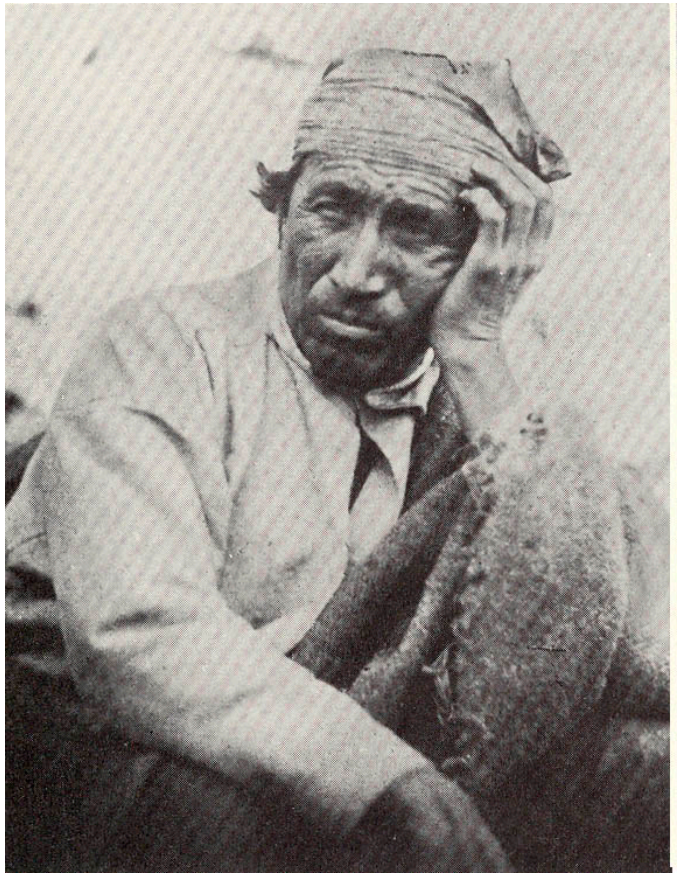


You May Need to Dig



The consequence may be negative for the environment.

- Your neighbors may not like you.

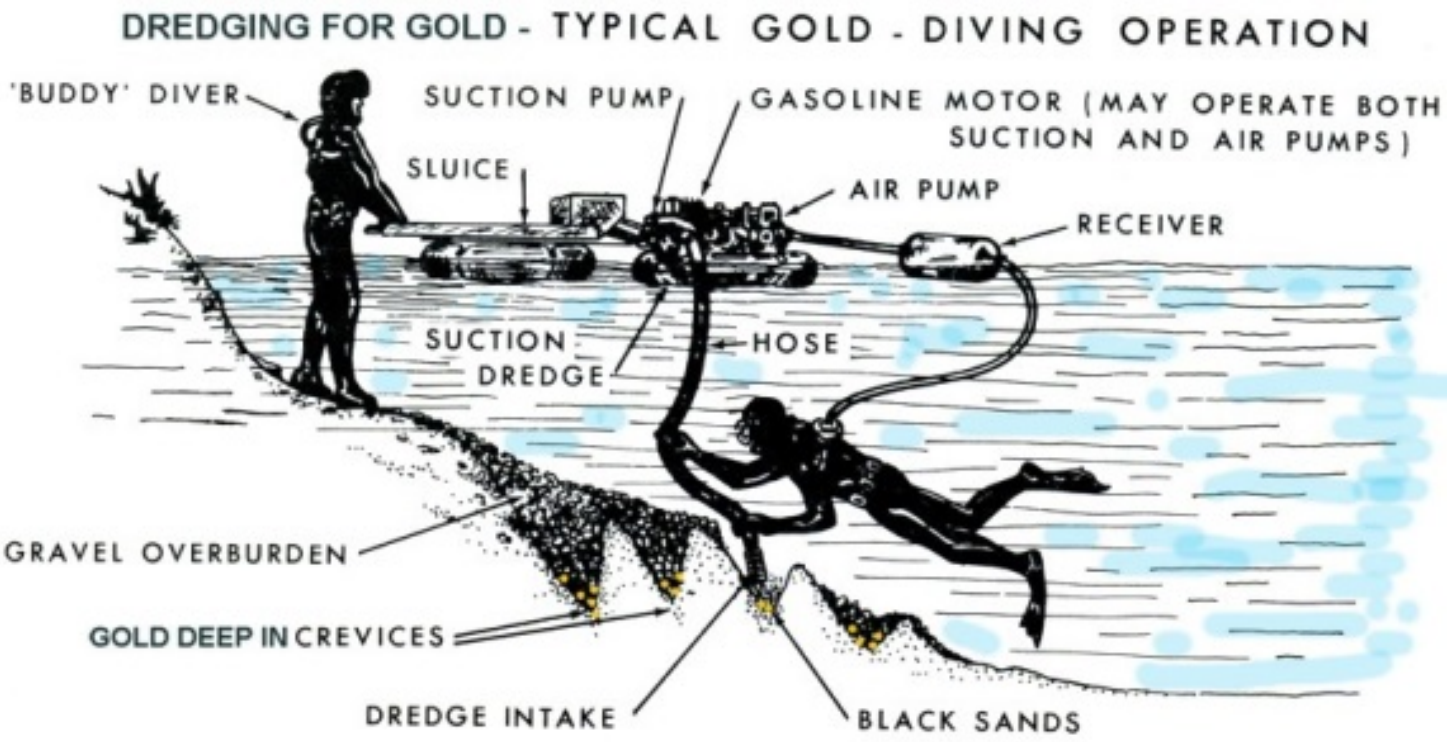


You might strike it rich!

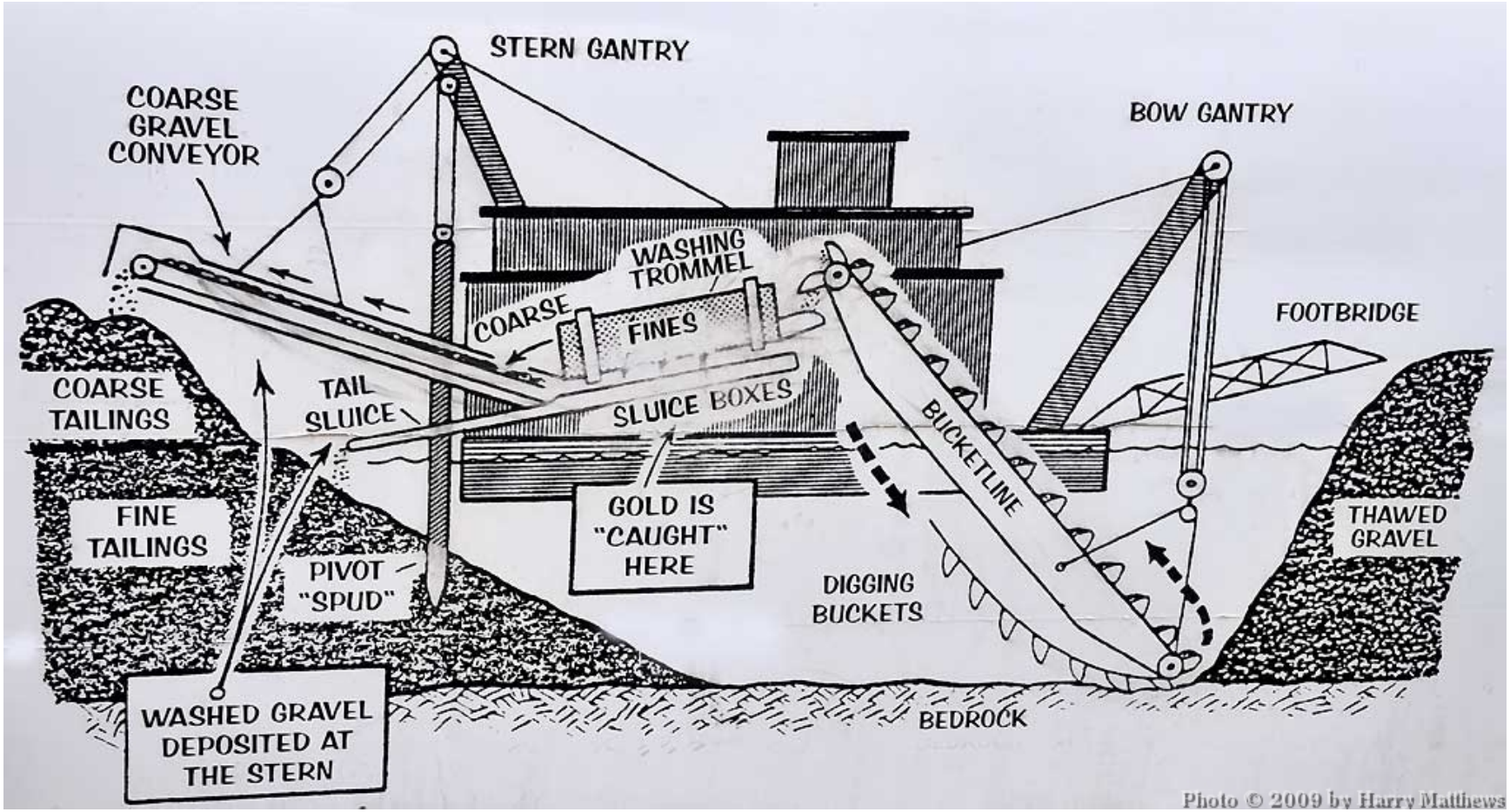
Dredging

- Valuable minerals can settle and be covered by rocks. Dredges move rocks on the bottom.

Dredge underwater portion (probably at a placer)



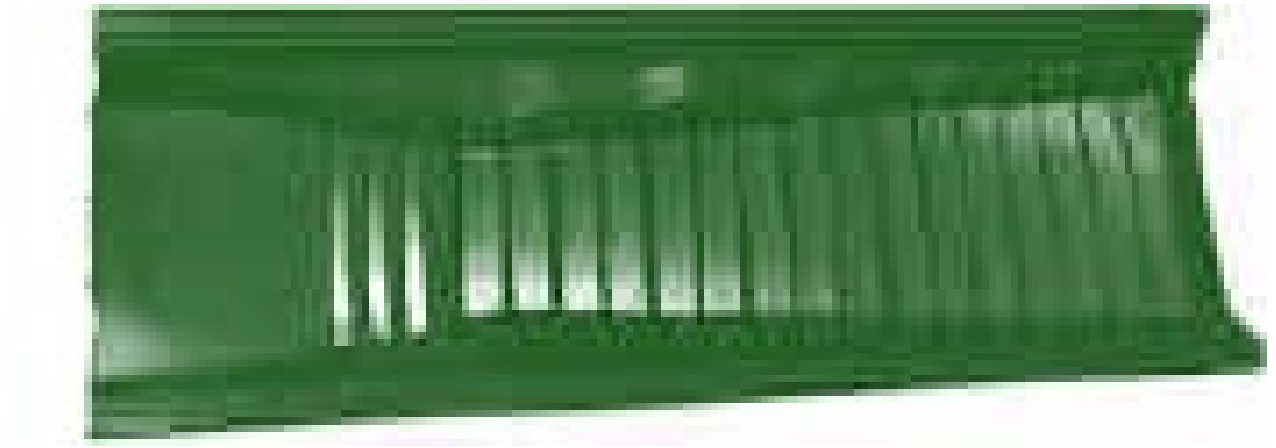
Dredge Diagram



Sluicing

- When you dredge up gravel, you run it through a screen to stop the large pieces.
- A sluice is then used. It catches the heavy gold and allows lighter quartz, etc. to wash away.

- This all-plastic sluice box features an aggressive riffle design that is extremely efficient on fine gold. The flared riffle design causes the water flow to slow as it passes through the sluice, resulting in optimum recovery characteristics. An ideal sluice for times when weight must be kept to a minimum. Size 12" x 48".



A big sluice

Rounded and water worn

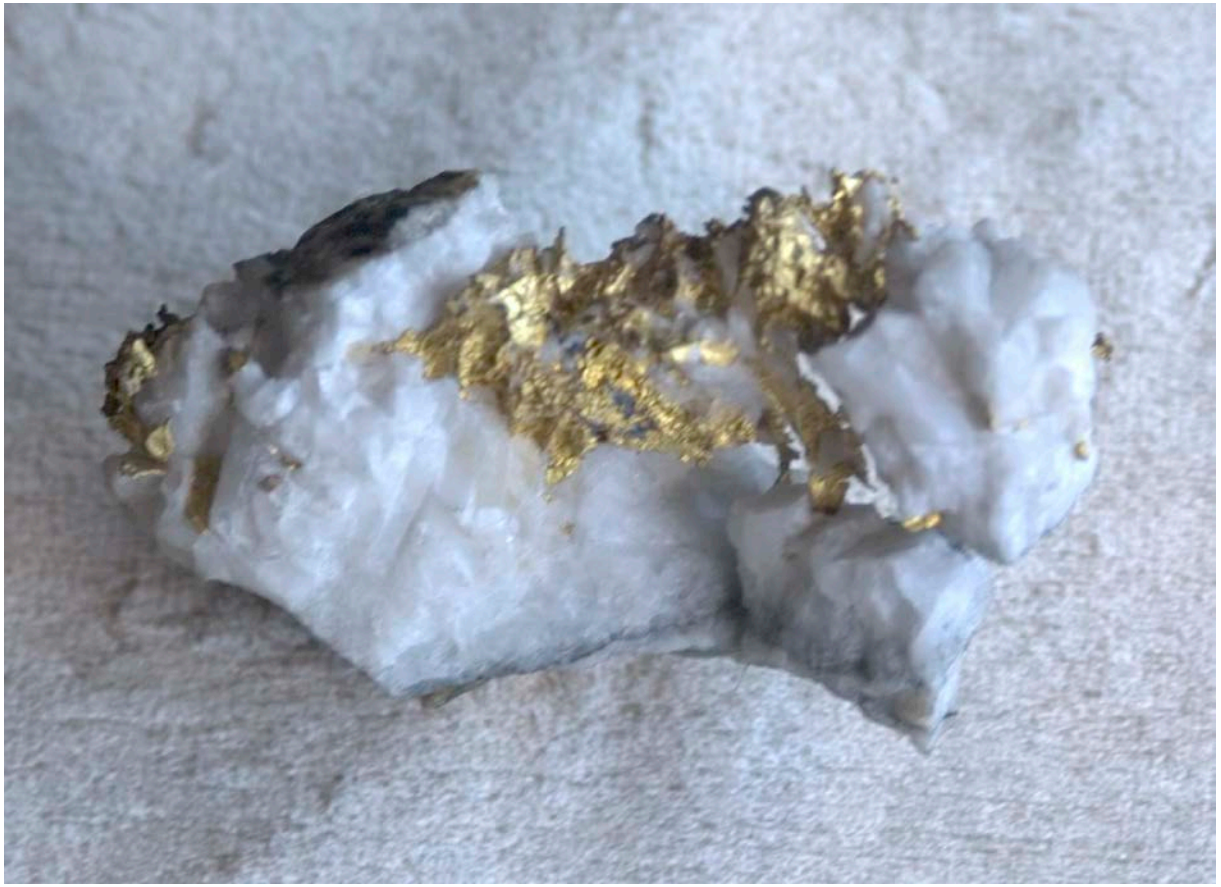
Open Pit Mining

Open pit exposing diamond gravel

Oranjemund diamond mine S.

Miners Search for Ore

- A rock containing valuable minerals



Ore may not be obvious

- Not all ore is high grade
- Sometimes nothing of value is visible
- You may still be sitting on a fortune
- Geochemical testing and an understand of what rock could potentially have ore are important for exploration

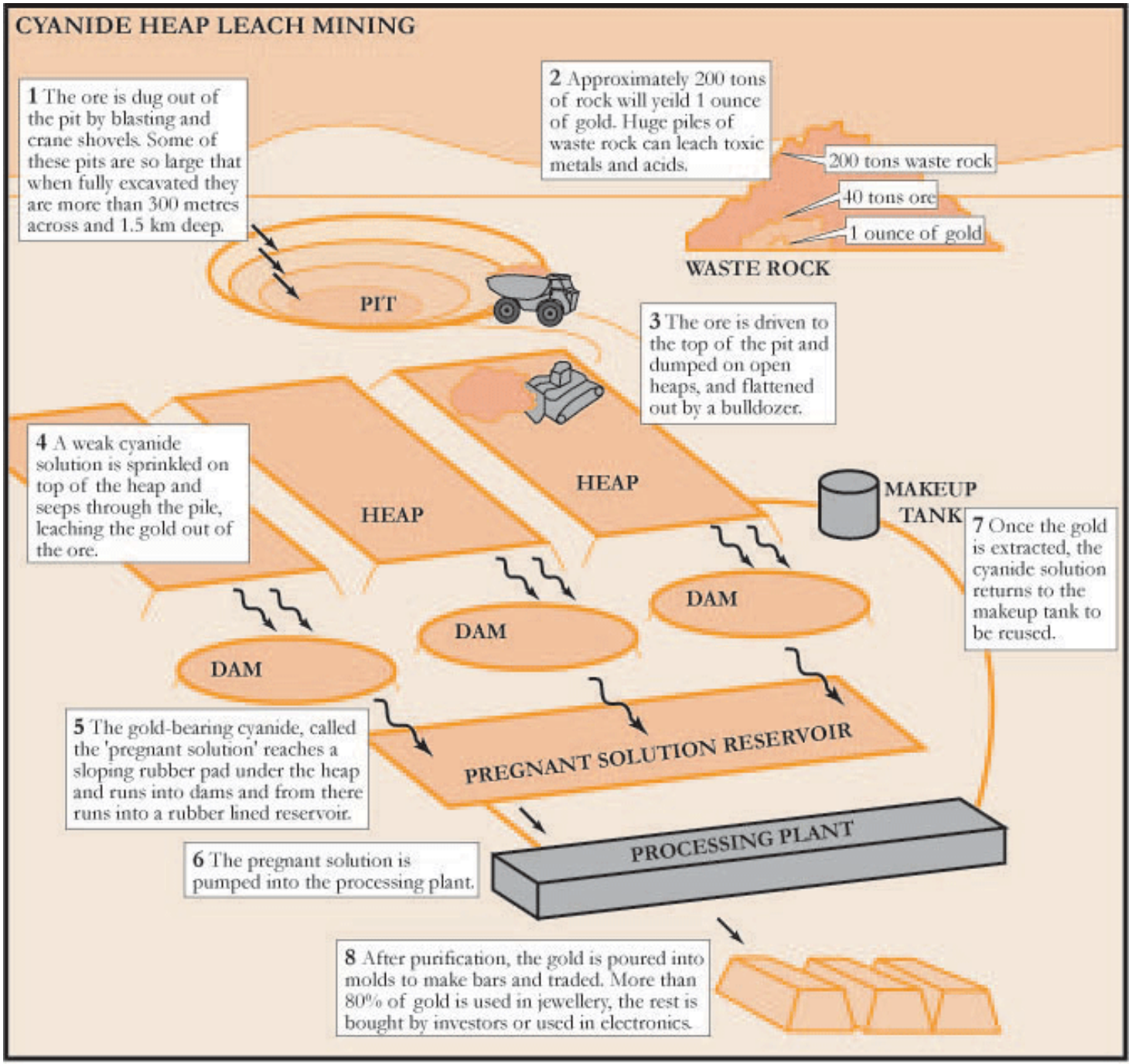


Illustration by Christina Nicholas

Cyanide disaster Baia Mare, northern Romania, Feb. 2000

Spread of the Cyanide Spill, 2000

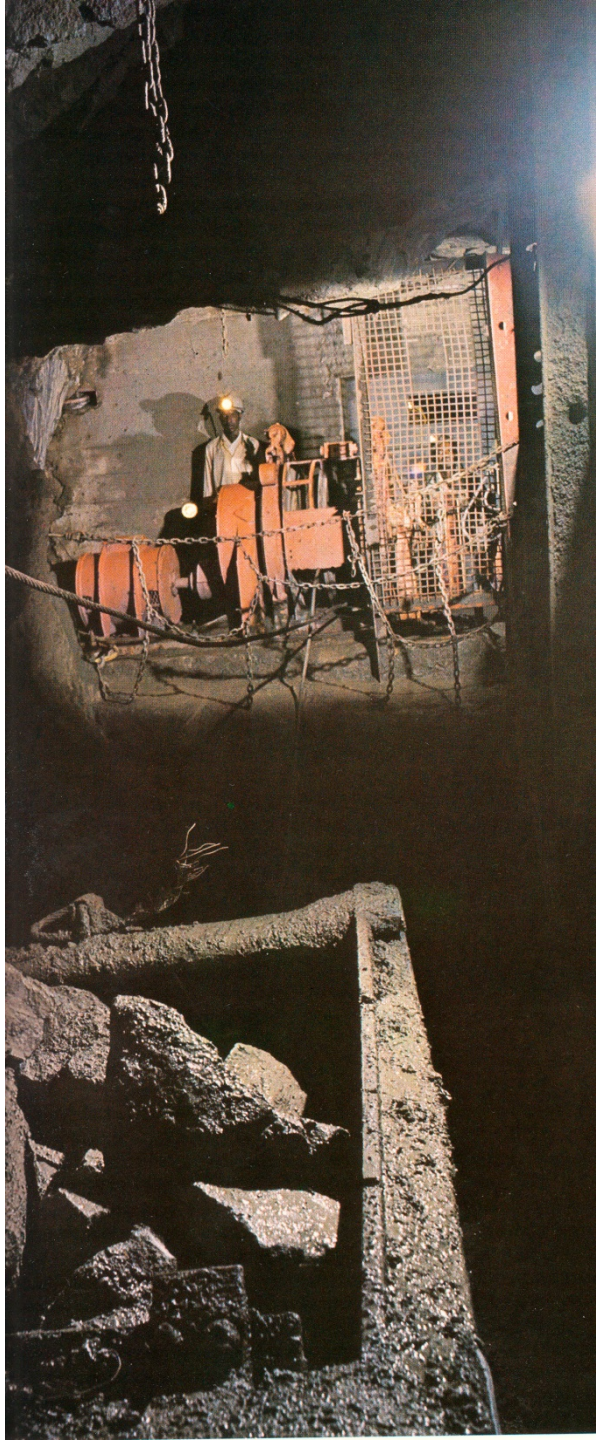
1. **30 January**
   Cyanide spill occurs at Baia Mare, Romania
2. **1 February**
   Spill plume reaches Romanian-Hungarian border
3. **5 February**
   Cyanide registers in tests at Tiszalök
4. **9 February**
   Spill plume reaches Szolnok
5. **11 February**
   Crosses the Hungarian-Yugoslavian border
6. **13 February**
   Plume reaches Belgrade, (Perlez), Yugoslavia
7. **15 February**
   It meets the Romanian border again, at Ram
8. **17 February**
   Cyanide shows up in tests at Iron Gate, Romania
9. **25-28 February**
   The plume reaches the Danube Delta

Illustration by Christina Nicholas

Underground Mining

Dangers

- Mine Collapse
- Rock blasts
- Suffocation
- Heat exhaustion
- Silicosis
- flooding



Why underground?

Getting the ore