



# ***Revealing the original purpose engineered Qanat- Karez- Falaj salt leaching system compared to the salt leaching and recovery today***

***David Bloch - M.R.Bloch Salt Archive***

**AUTHOR David Bloch – SALT ARCHIVE M.R.Bloch**



17/6/18



SABKHA SALT



# Nile Delta 1933



THE ORIGINAL  
RESERVE CURRENCY

## Hebrew Weight Stones



City of David museum

[www.bible.ca/coins](http://www.bible.ca/coins)



## SALT, GROWN ON STICKS HARVESTED FROM SEA.

Salt is being "grown" on sticks, in a new process of making it from sea water that has been successfully used in Alexandria, Egypt. Water from the Mediterranean Sea is led to large wheels placed on the sand, which have long salt pans of poles. The salt from the sea is stirred in tanks, around the sticks, to allow it to crystallize. The salt crystallizes upon the sticks, producing numerous stick-shaped pillars of the salty substance. In the market, the salt is generally sold, the salt was generally obtained by evaporating in the form of sticks.

**TALENT=KIKHAR [loaf]**

**-3000 SHEQUELS [weight]**

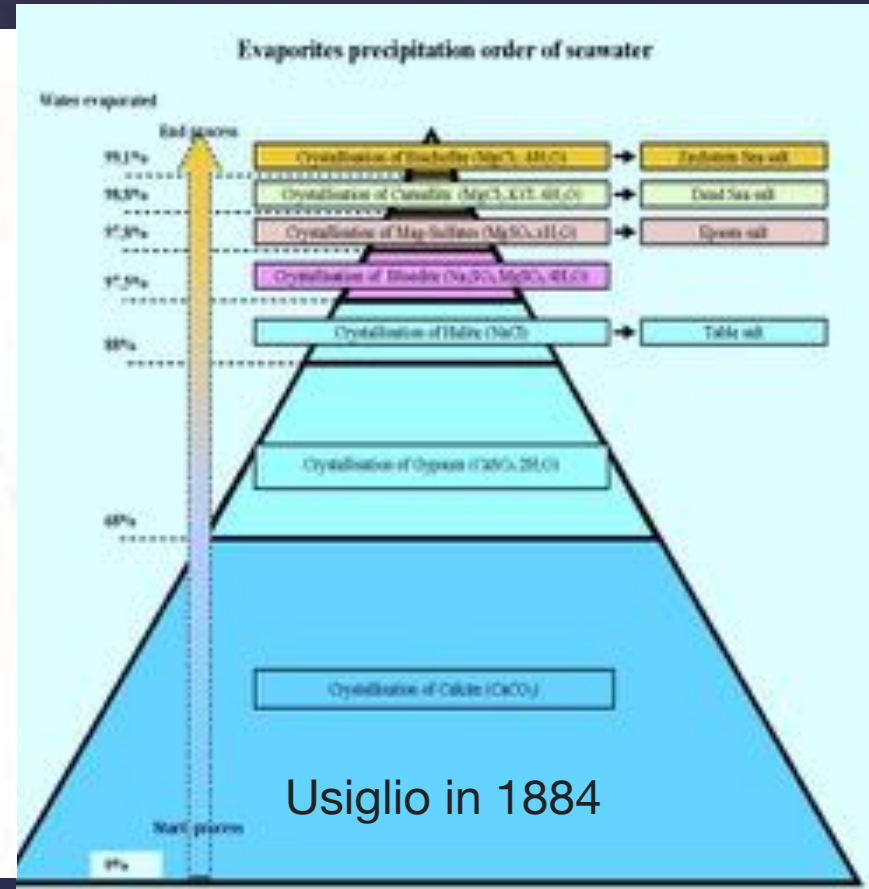
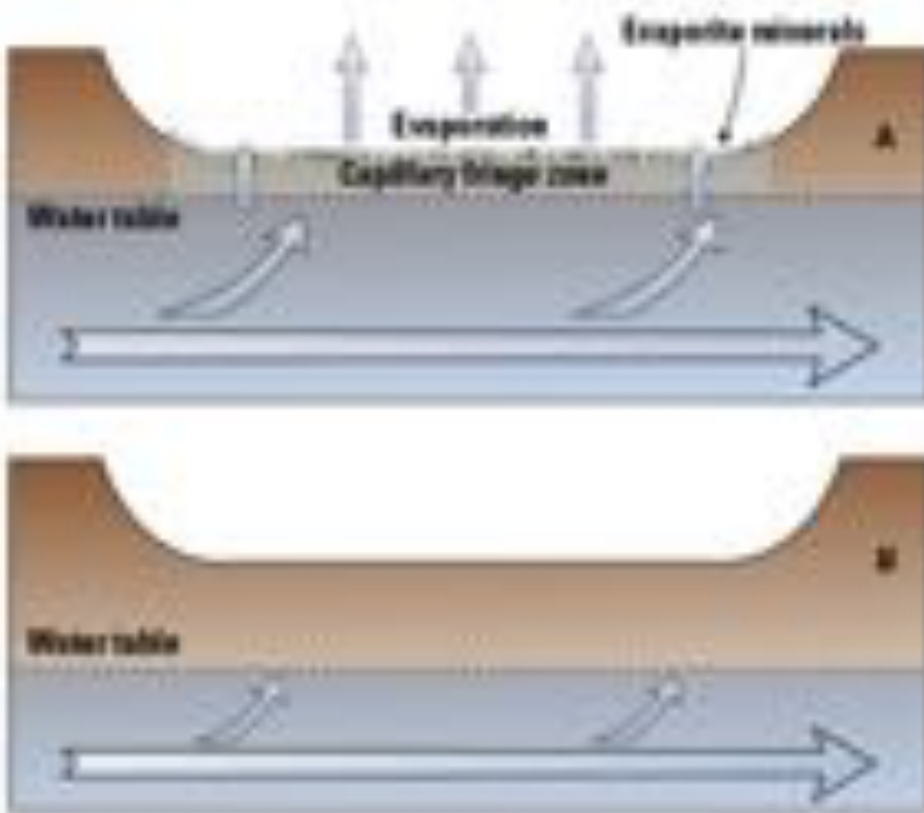
**SALT CAKES =MONEY**



# SHAPING SLABS OF SALT CRUST



## Precipitated salts

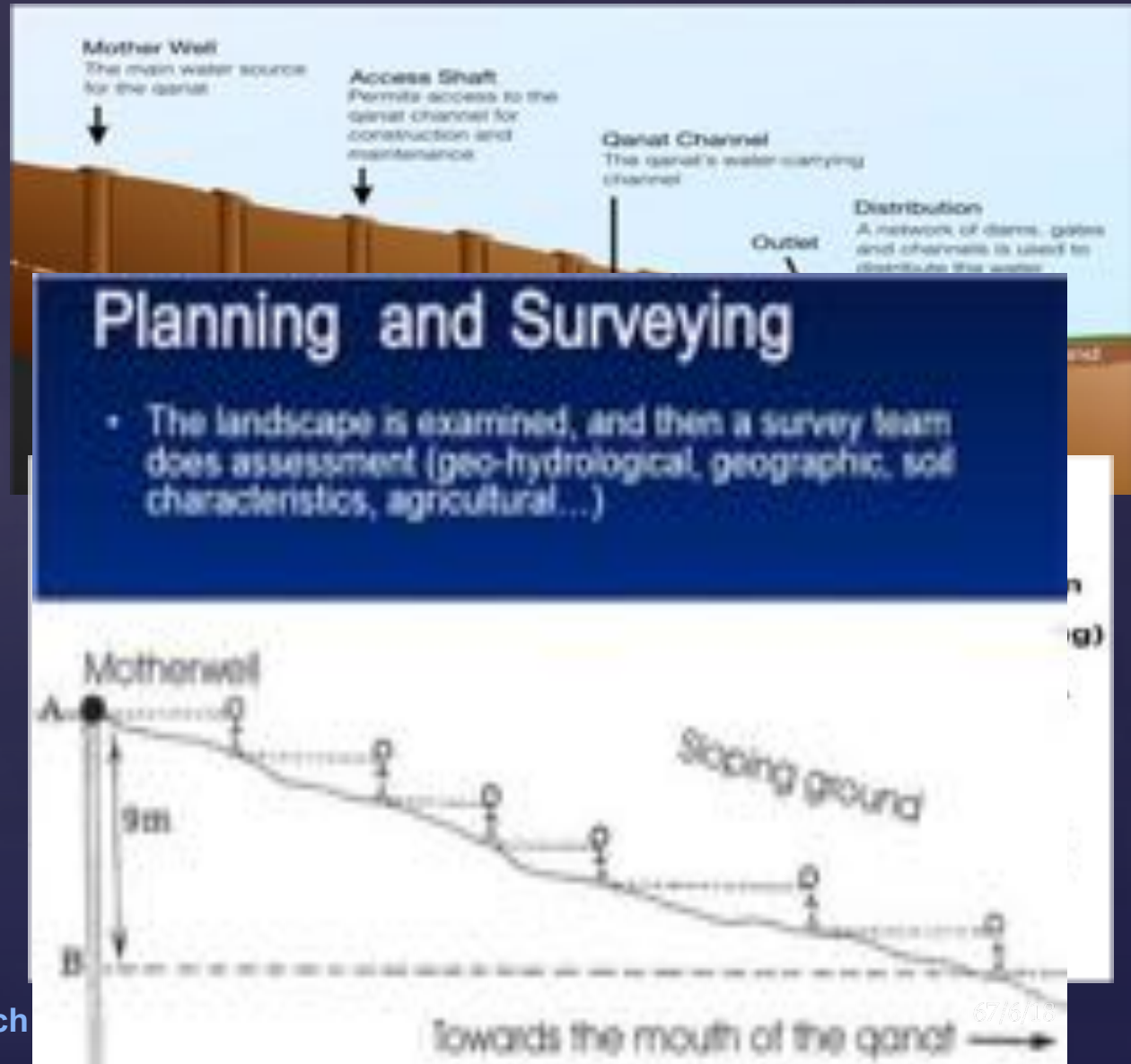


# ORDER of precipitation

## What is a Qanat?

...  
*underground  
 irrigation canal  
 between an  
 aquifer  
 on the  
 piedmont  
 to a garden on  
 an arid plain ...*

AUTHOR David Bloch

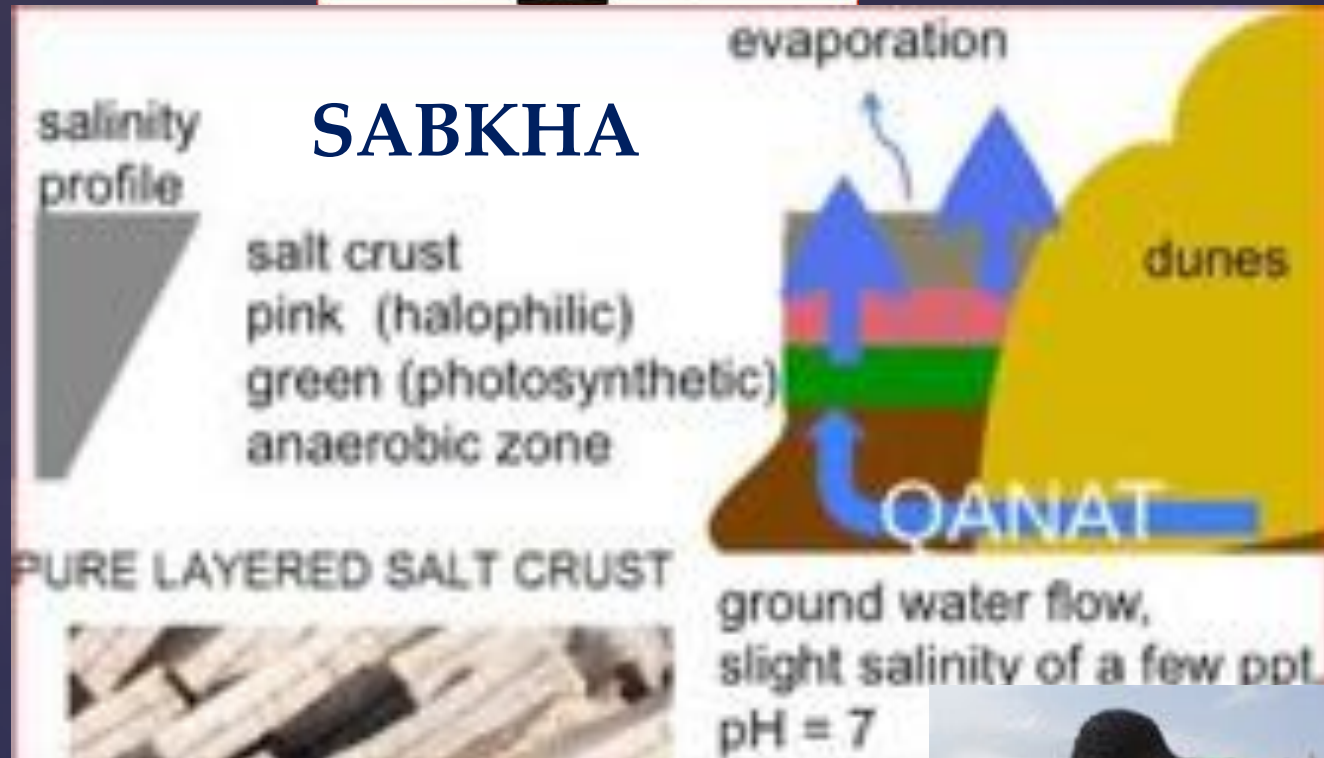






# Qanat bore hole lines in flat alluvial desert basin porous subsoil





# Crust precipitation schematic







MOTHER  
WELL

Cistern

Cistern

# YAZD QANAT MUSEUM

MIGRATION OF SALT PRODUCTION  
FROM “COASTAL SABKHA”  
TO ENDORHEIC BASIN  
SABKHA



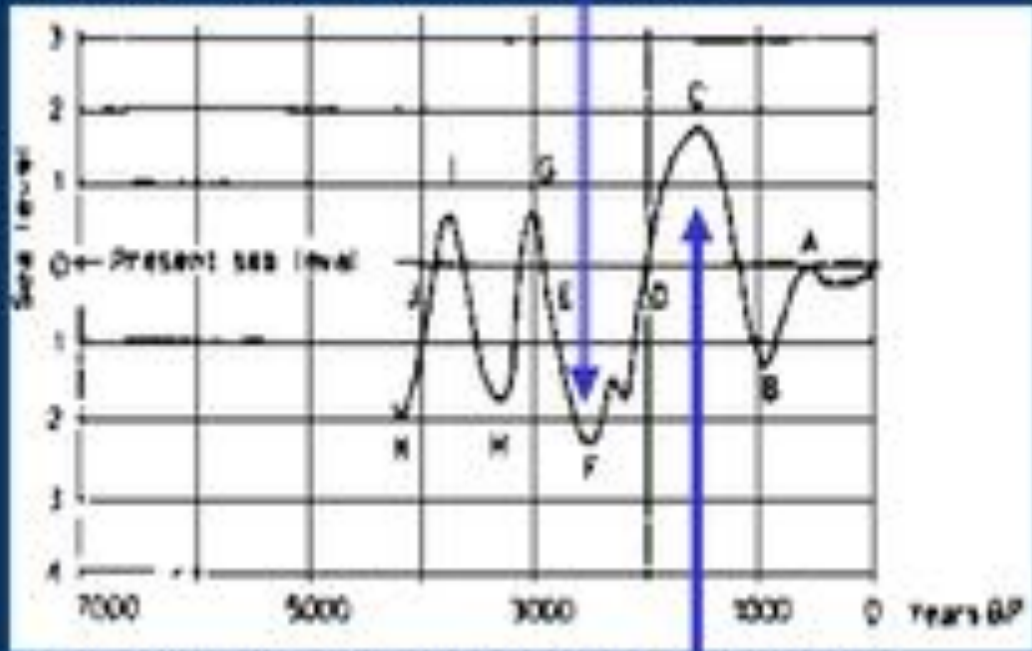
**The most reliable evidence of  
fluctuating eustatic sea levels  
[since the end of Holocene] was  
SABKHA salt pan technology.**



RISING SEA  
LEVELS  
FLOODED  
SALT PANS

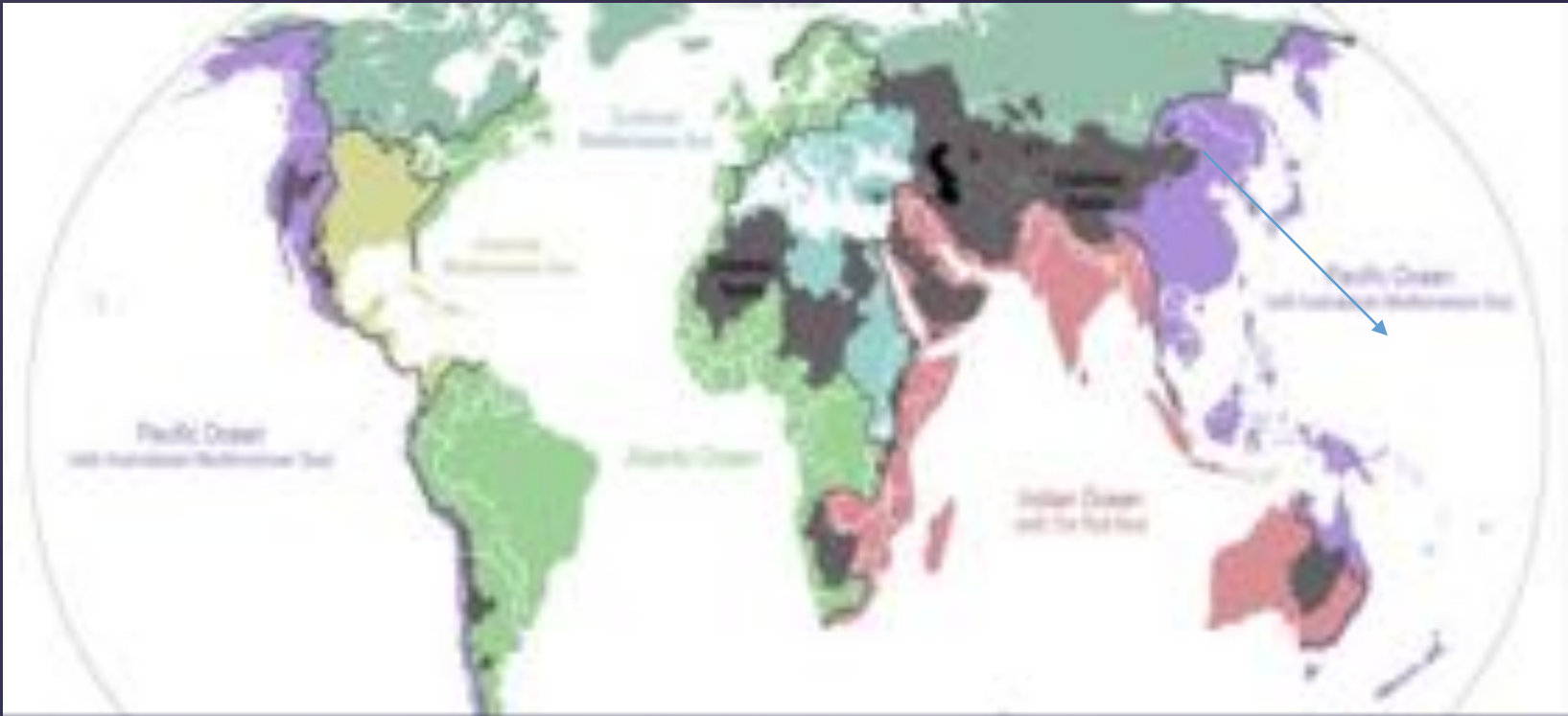
along China,  
Yucatan,  
North Sea and  
Mediterranean  
coasts salt  
production

Low sea levels allowed mass production of salt almost  
Anywhere along the flat exposed coasts

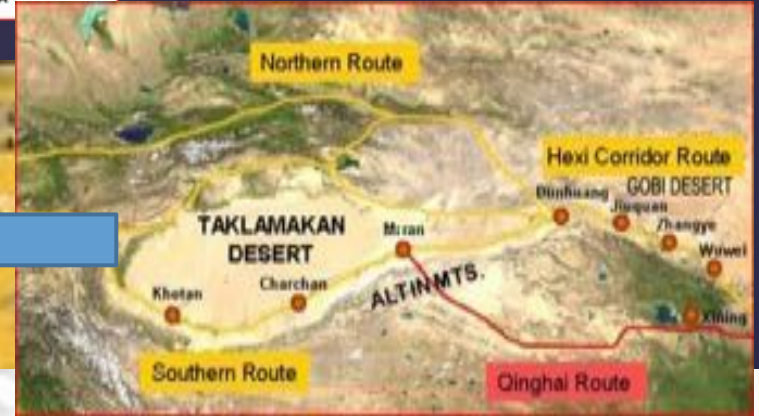


High sea levels diverted production to exclusive  
Inland lakes and mines, limited in capacity





# SABKHA – ENDORHEIC BASINS



Coastal SABKHA Salt production was forced inland

SILK ROAD ARCHAEOLOGY SITES



# PRISING SLABS OF SALT CRUST



Figure 3 : levering up slabs of layered salt



Figure 4 : Modern Transport of salt crust slabs



QANAT  
DRILLING  
BOREHOLES

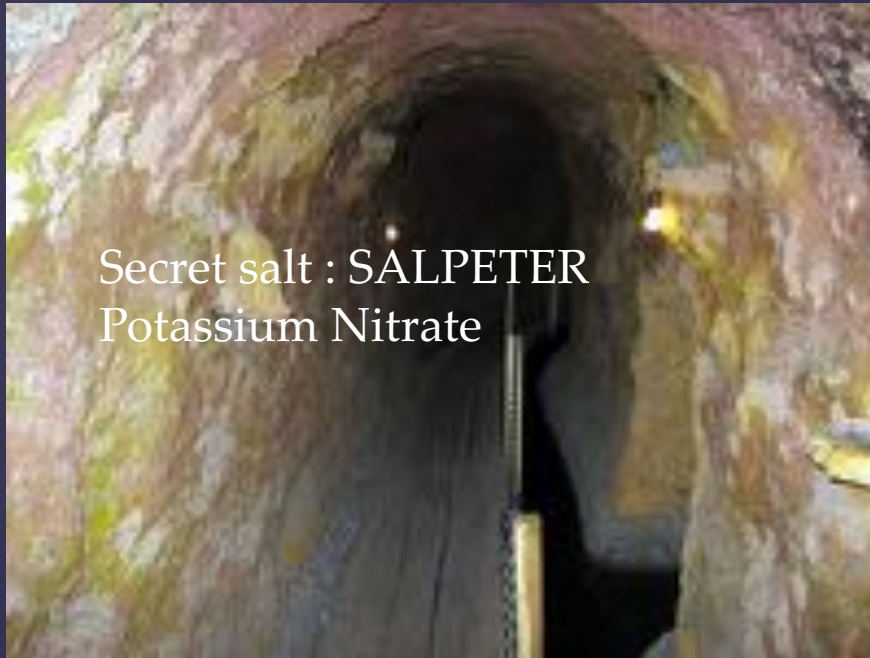


Chinese salt pans TienKung Khai – “the exploitation of the worlds of nature”

## INLAND "SABKHA"

Qanat bore holes  
and "sink holes"





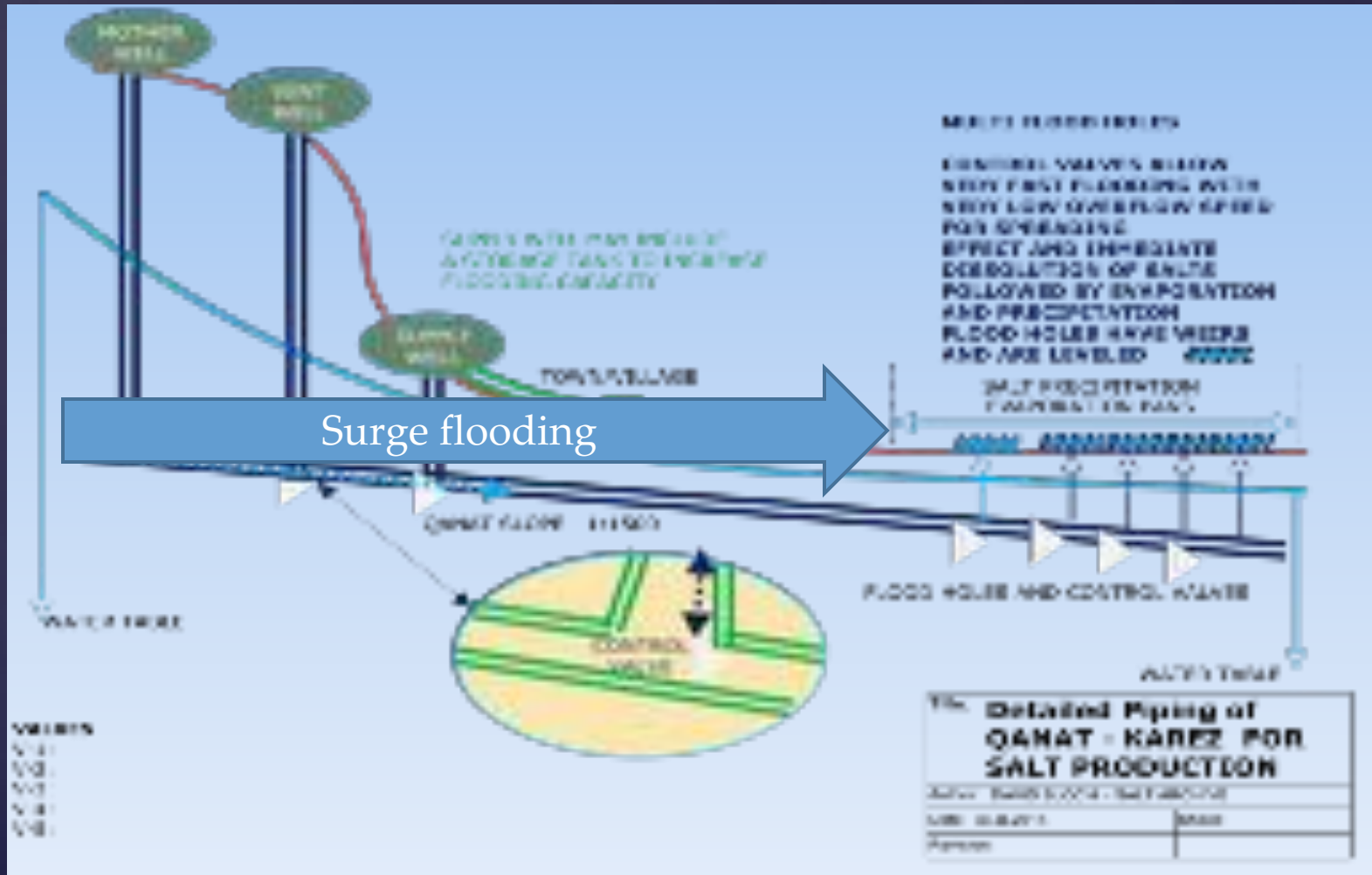
Secret salt : SALPETER  
Potassium Nitrate

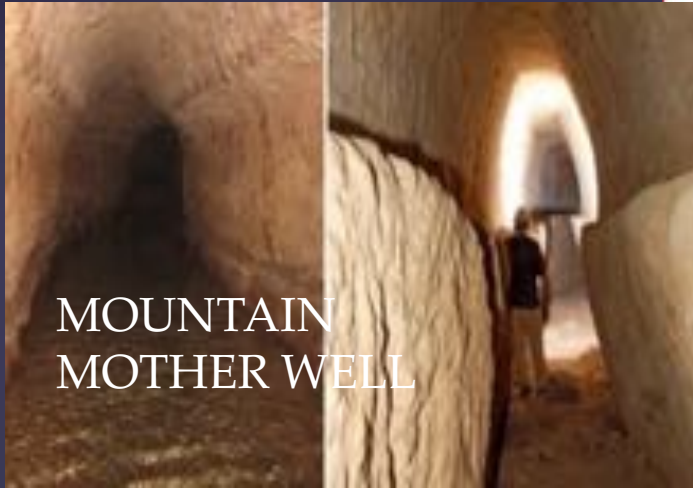
# Turpan tunnel - efflorescence

Tens of thousands of  
QANAT / KAREZ  
TUNNELS Thousands of  
miles  
Long

TURFAN today there  
remain over 1100 karez  
wells and channels  
having a total length of  
over 5,000 kilometres  
(3,100 mi)



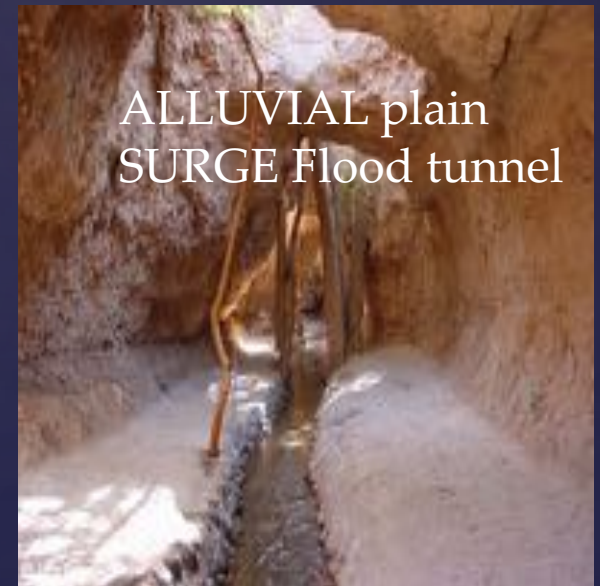




MOUNTAIN  
MOTHER WELL



VILLAGE ACCESS  
tunnel

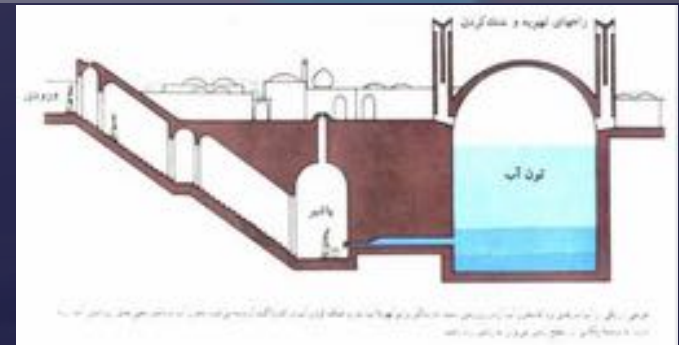
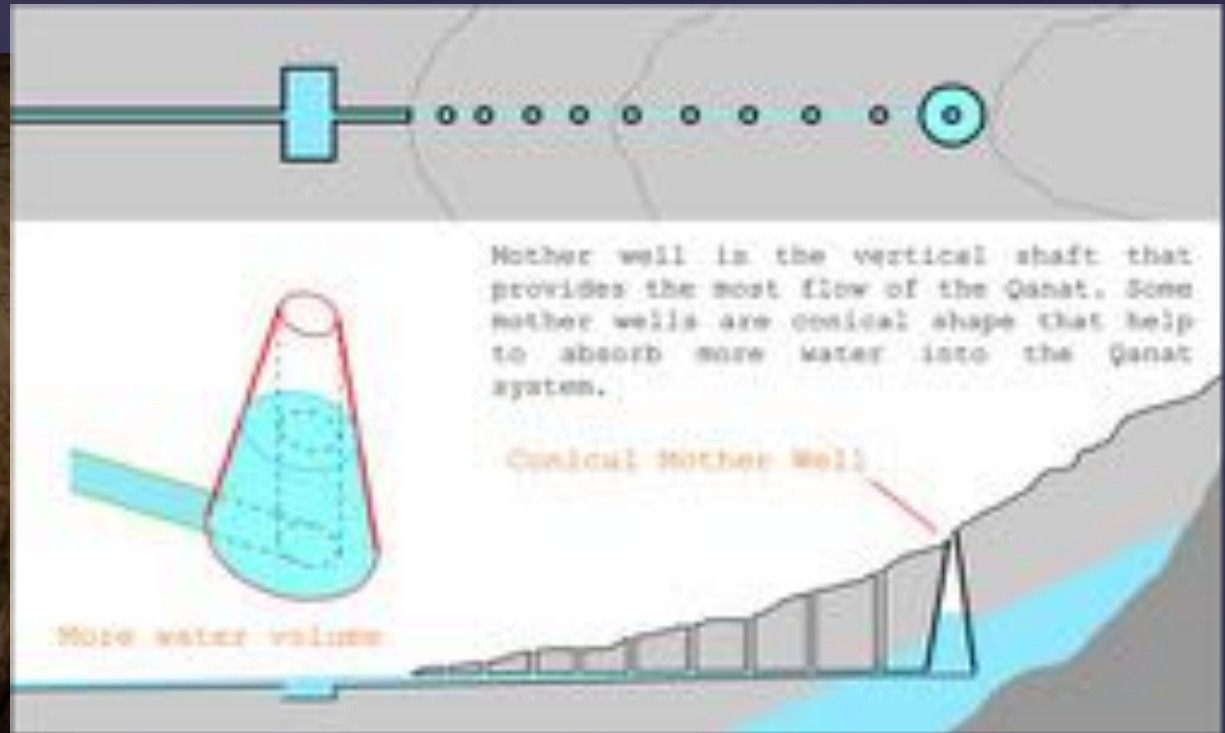


ALLUVIAL plain  
SURGE Flood tunnel

# 3 types of tunnel



# Tunnel volume for flooding

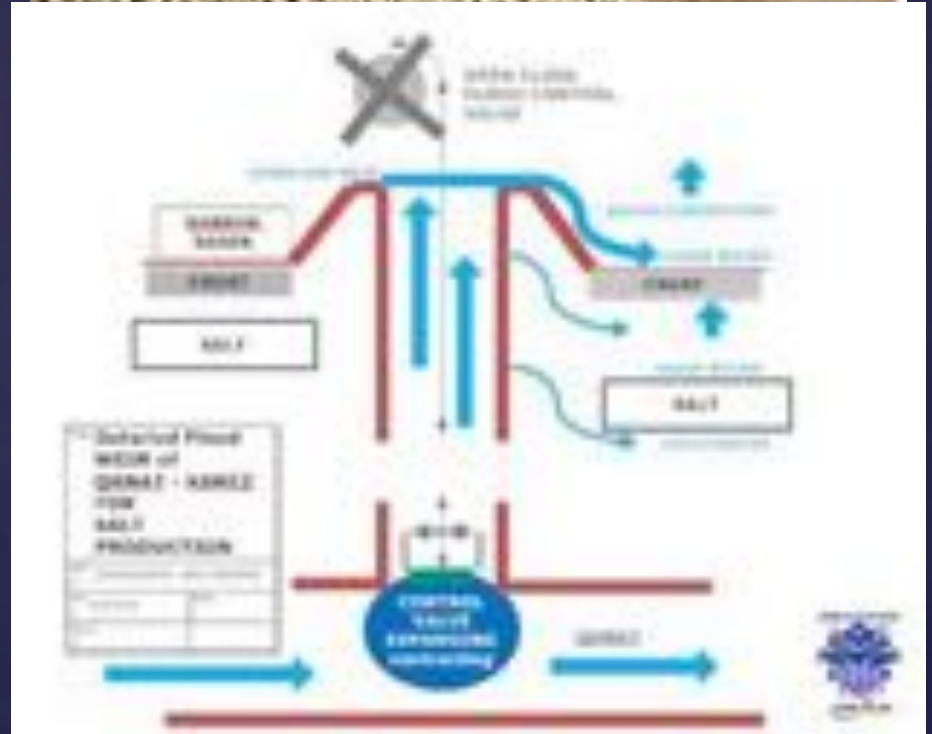


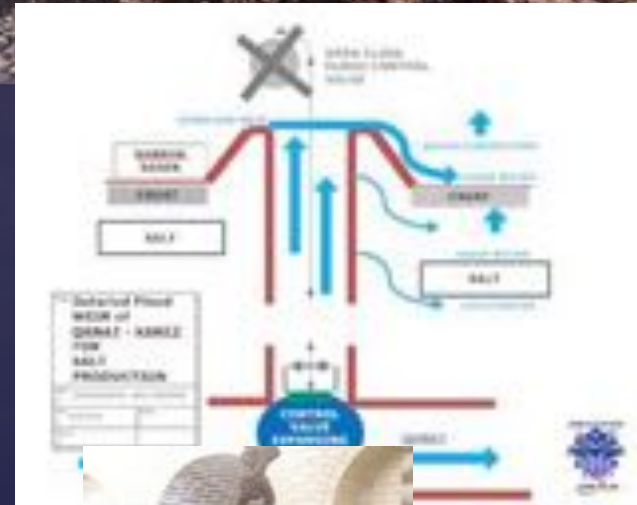




# QANAT TECHNOLOGY

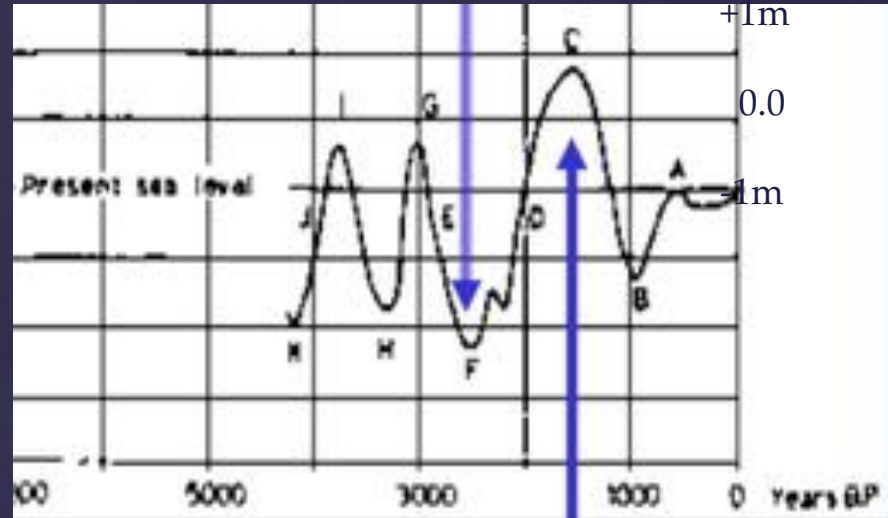
# QANAT OPERATION





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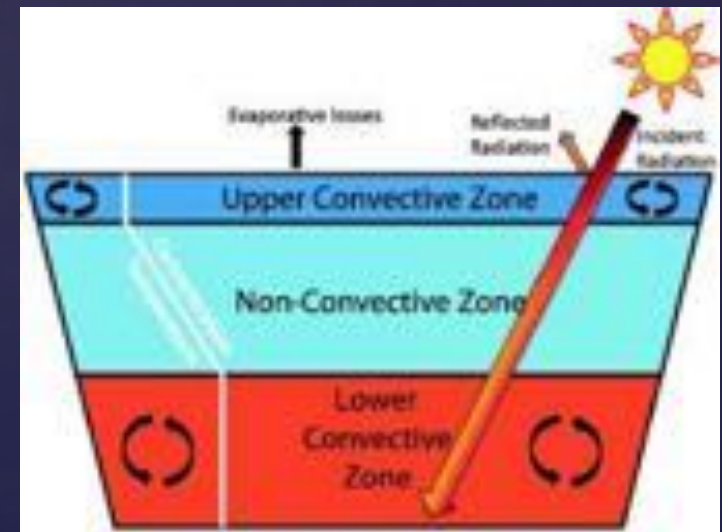
***F = Beginning of ROMAN  
EMPIRE 450 BC***

***C = Beginning of ISLAM  
650AD***

# INLAND ENDORHEIC SABKHA BASINS

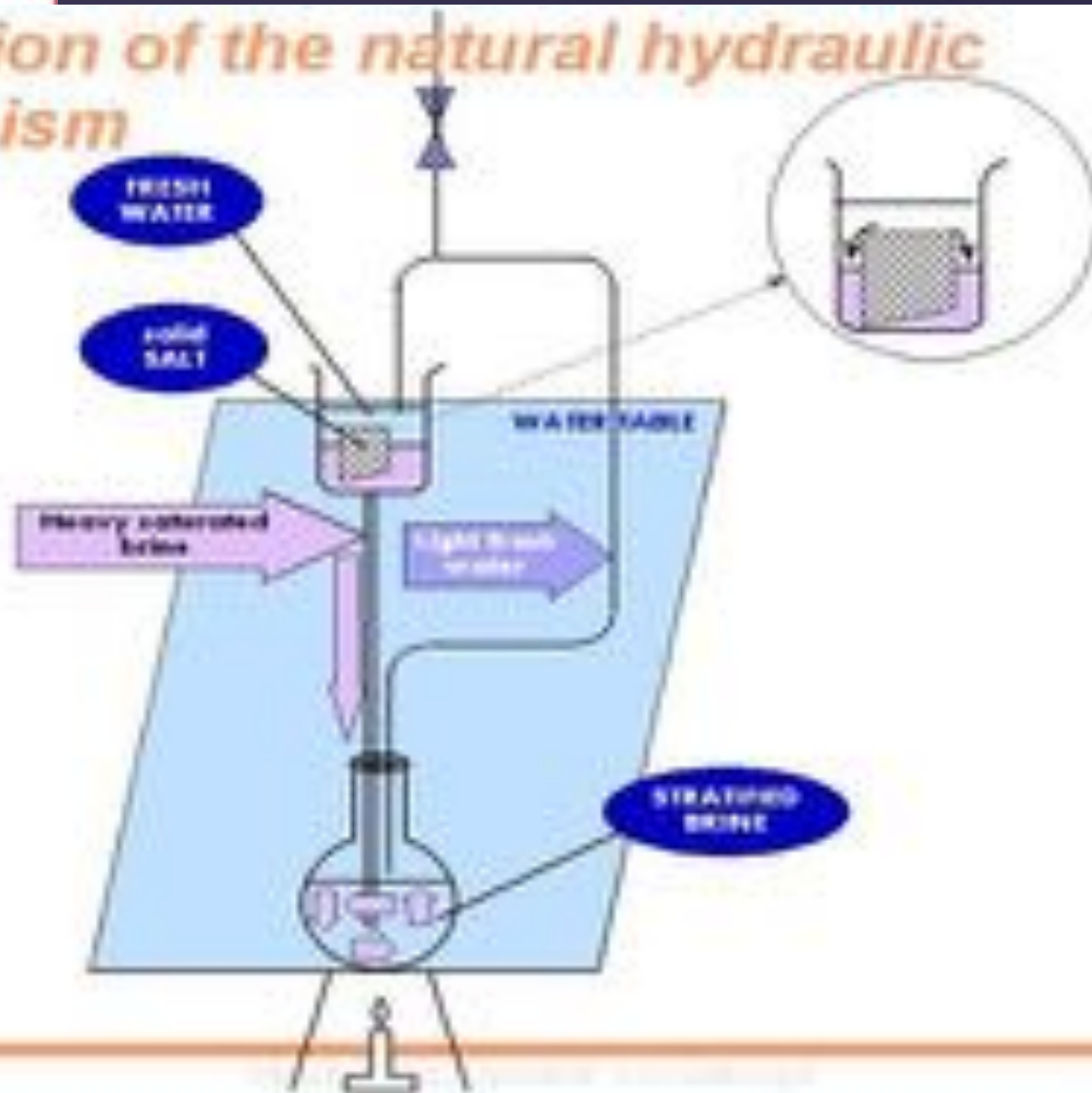
?  
3000 years BP  
Why engineer,  
and build *hundreds of  
thousands of*  
**Qanats** to bring  
fresh water  
to *barren, saline,  
endorheic, extreme  
deserts* ?

Flat escarpment and  
Gradient brines



# Simulation of the natural hydraulic mechanism

- Sand filled volume
- Saline gradient
- Solid salt deposit
- Stratified brine does not mix with fresh makeup water

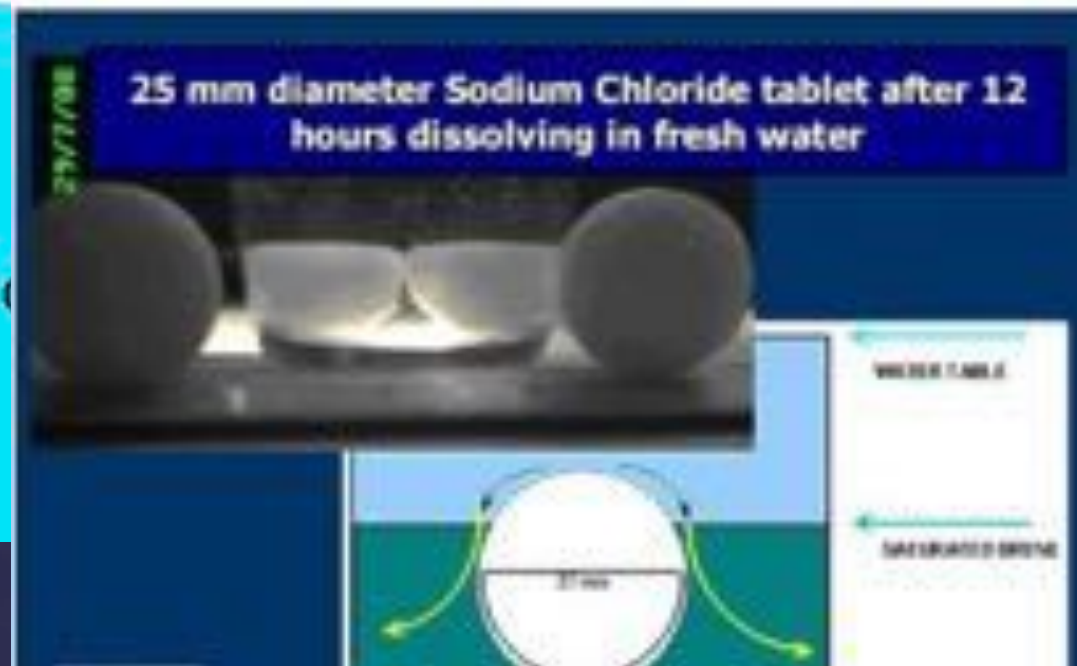
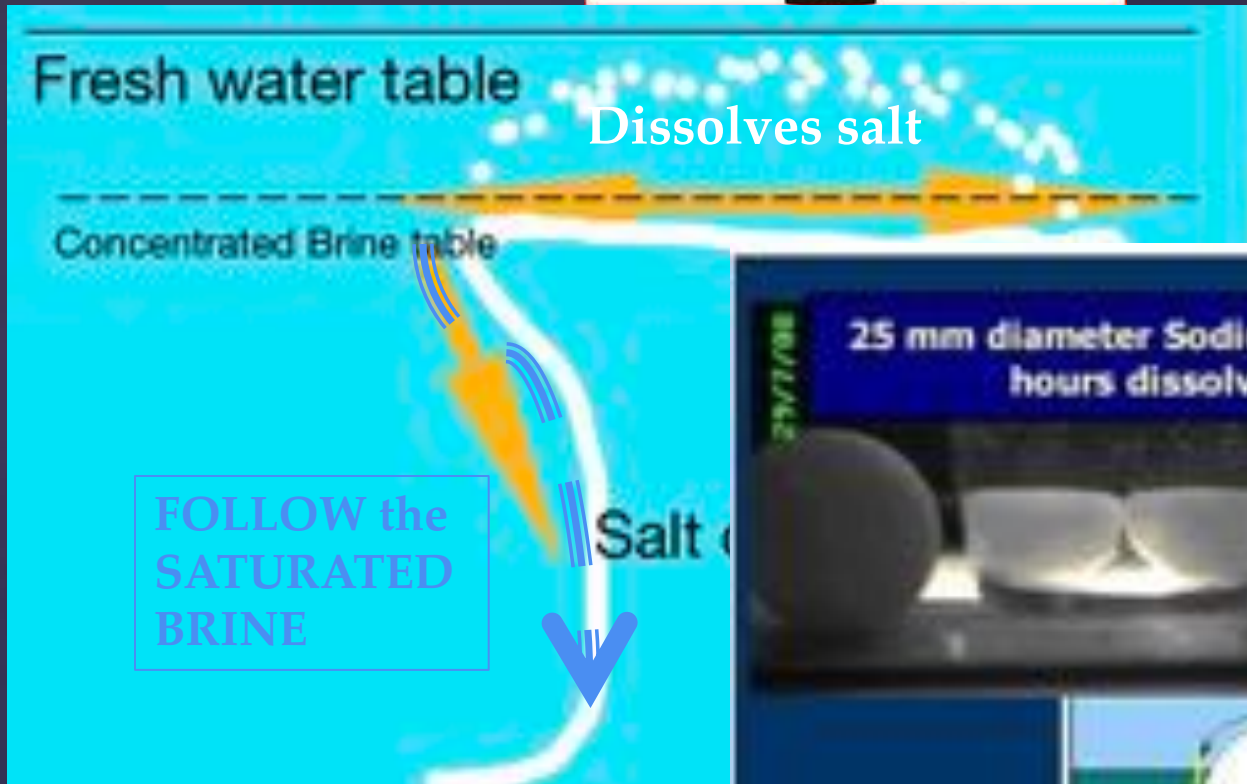


on “

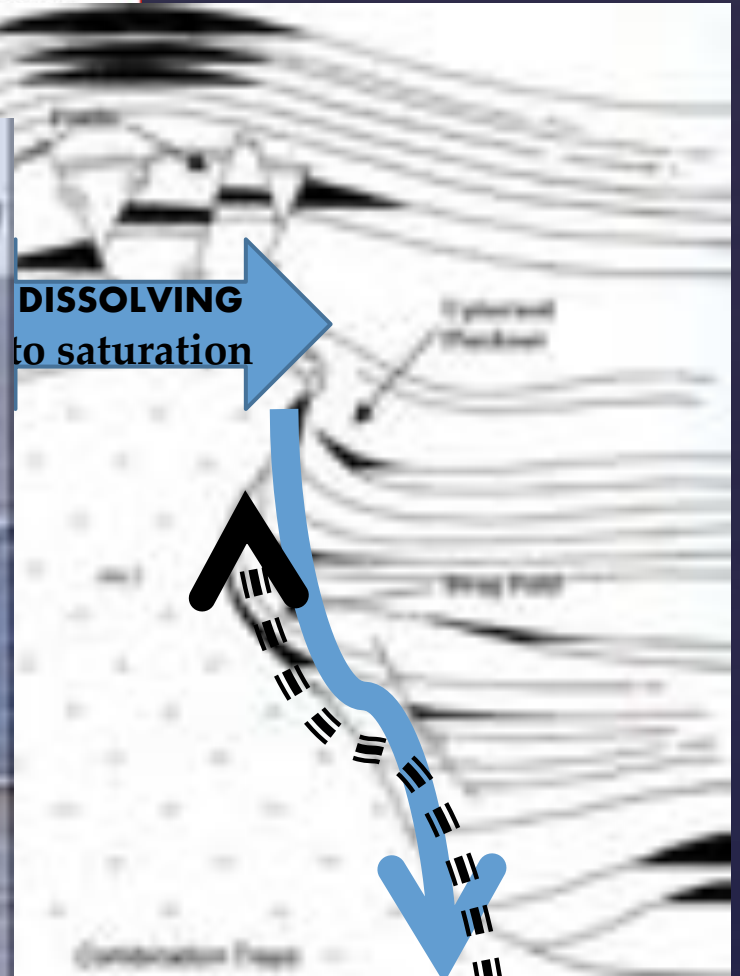
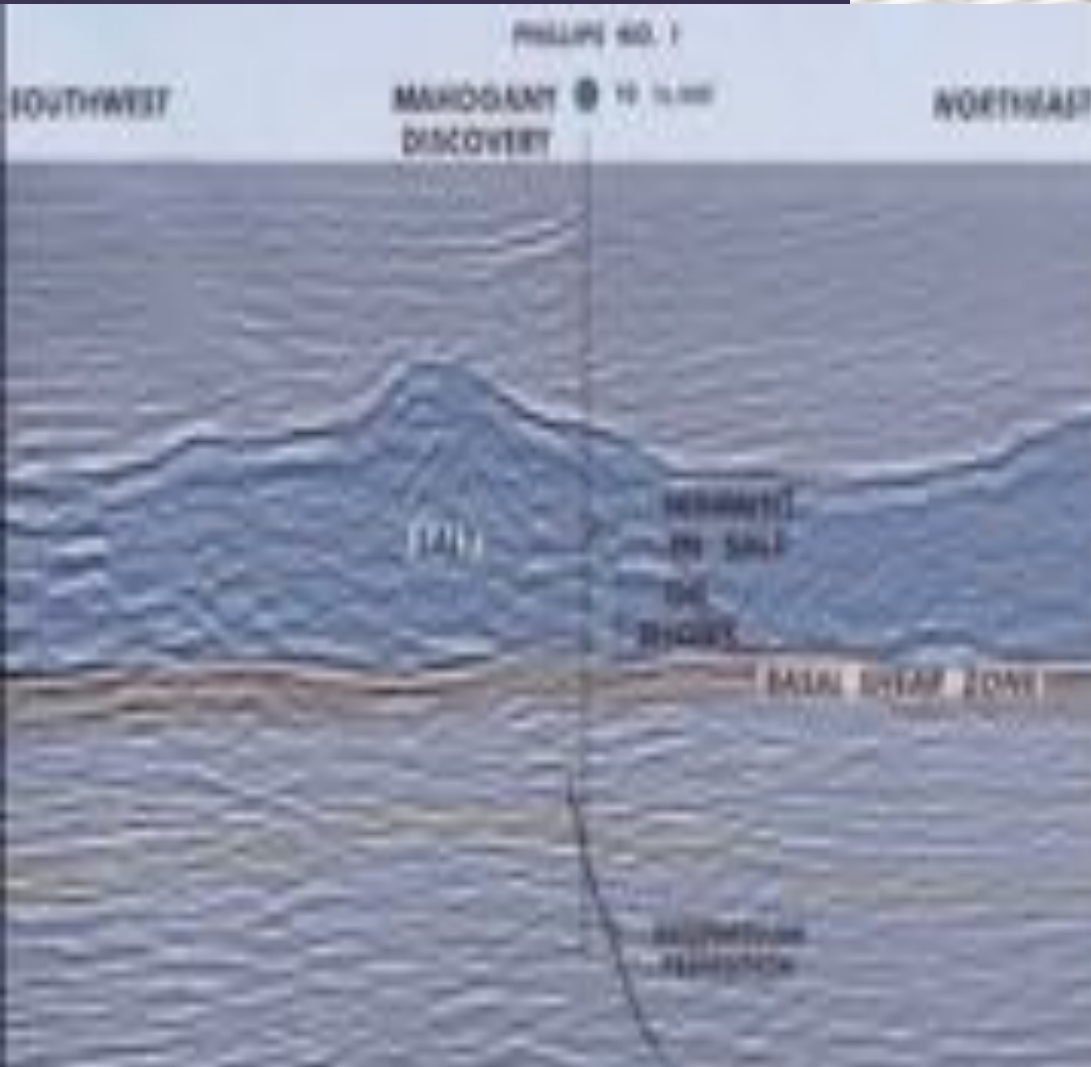
APRIL 15, 2018

About Salt  
2018



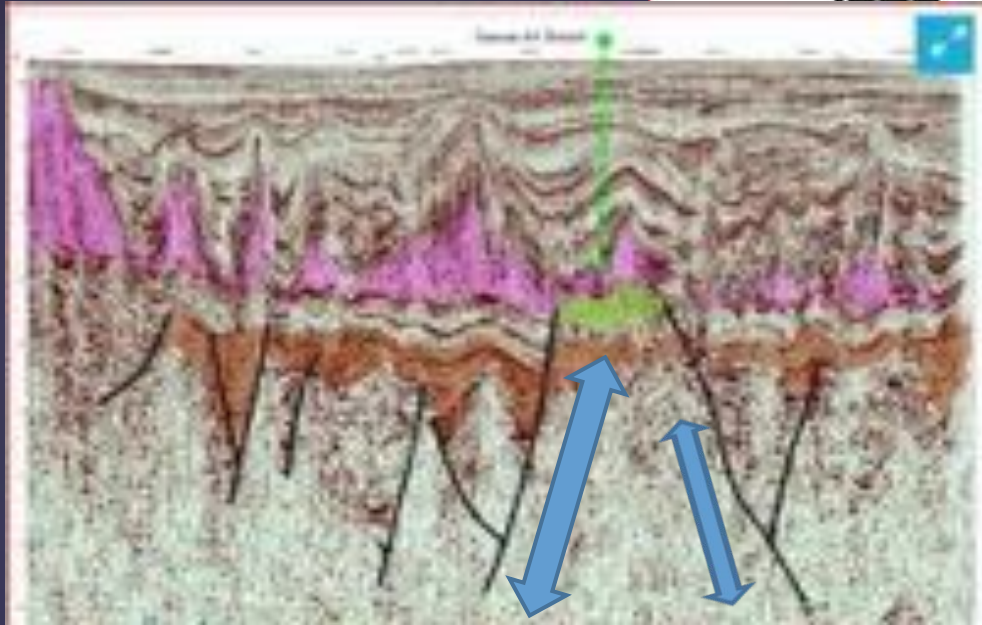


# Salt table (salt mirror)



DISSOLVING  
to saturation

Geothermal  
pool

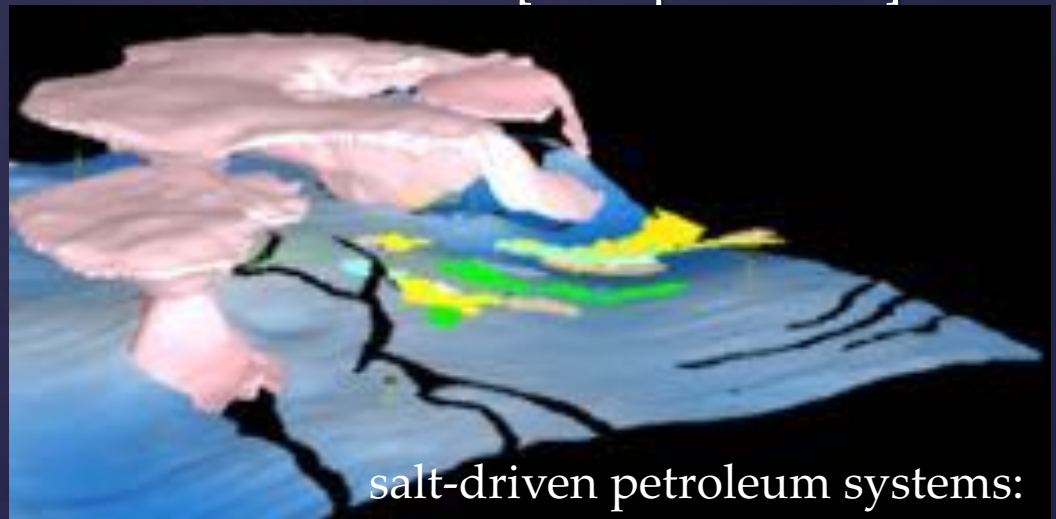


“The perfect  
pre-salt play  
trapping  
hydrocarbon  
system.”

Spectrum 2D  
PSDM in depth.  
[Campos basin]

Typical FAULTS  
ALLOWING BRINE  
to migrate down

GEOHERMAL  
GAS AND OIL TO  
MIGRATE up

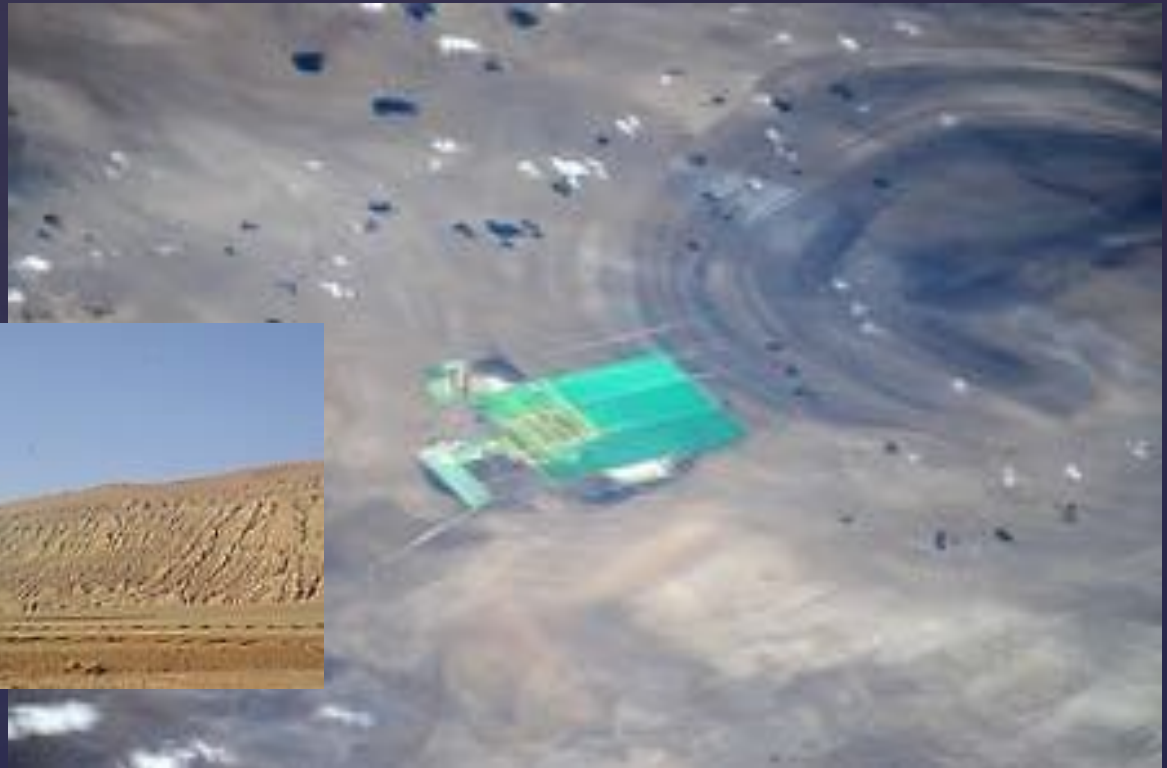




BARIUM  
MAGNESIUM  
BORON  
URANIUM  
STRONTIUM  
POTASH  
MANGANESE  
LYTHIUM COBOLT - oil gas etc etc

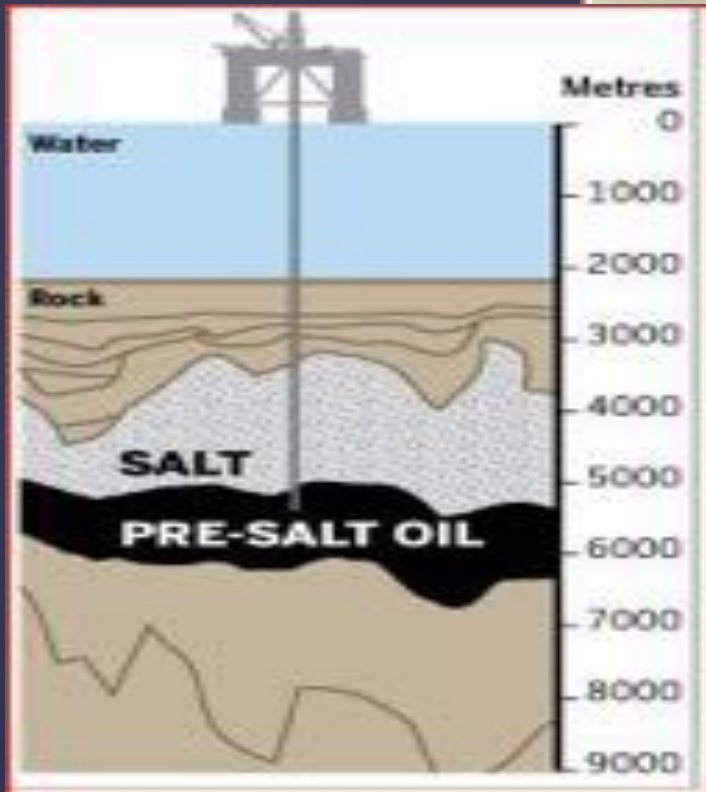


New Silk Road leaching  
products



# China - LOP NUR plant using Qanat technology - to produce Sylvite brines

## RENEWABLE OIL/GAS



# SALT MIRROR (TABLE) technology

AUTHOR David Bloch – SALT ARCHIVE M.R.Bloch





**Control of world “Albedo” by massive salt leaching using the ancient purpose engineered Qanat-Kariz-Falaj technology to control fractional coverage of crystalline white salt precipitation over vast areas of existing endorheic basins.**

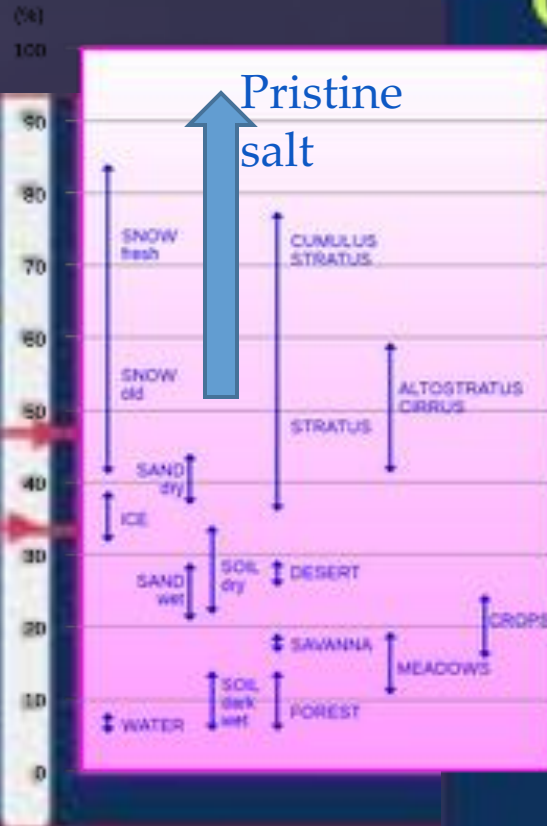


David Bloch<sup>\*</sup> M.R.Bloch SALT ARCHIVE- Owner of Chemical Engineering consultancy- MBL Separation Engineering, Israel

# A whiter shade of pale

# QANAT SALT BASINS

TO MAINTAIN  
PRISTINE WHITE  
PRECIPITATED  
SALT  
ENDHOREIC  
DESERT BASIN  
SUMMER  
SURFACES  
ALBEDO 0.94



Control of the  
Albedo  
between these  
levels

Ice Age Albedo

Present Albedo

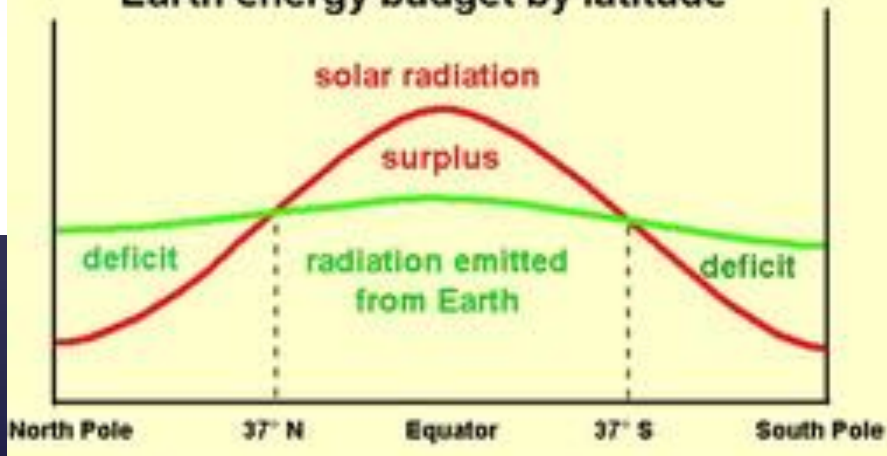
# Control world ALBEDO



## Albedo



### Earth energy budget by latitude



4<sup>th</sup> World Conference on

**Climate Change**

Rome, Italy October 19-21, 2017

**ALBEDO**  
*control*





# THANK YOU

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salt-driven petroleum systems:

Greek "ευ" (eu = easy) and  
"Τήξις" (teksis = melting)

eutectic  
freeze crystallization  
(EFC)





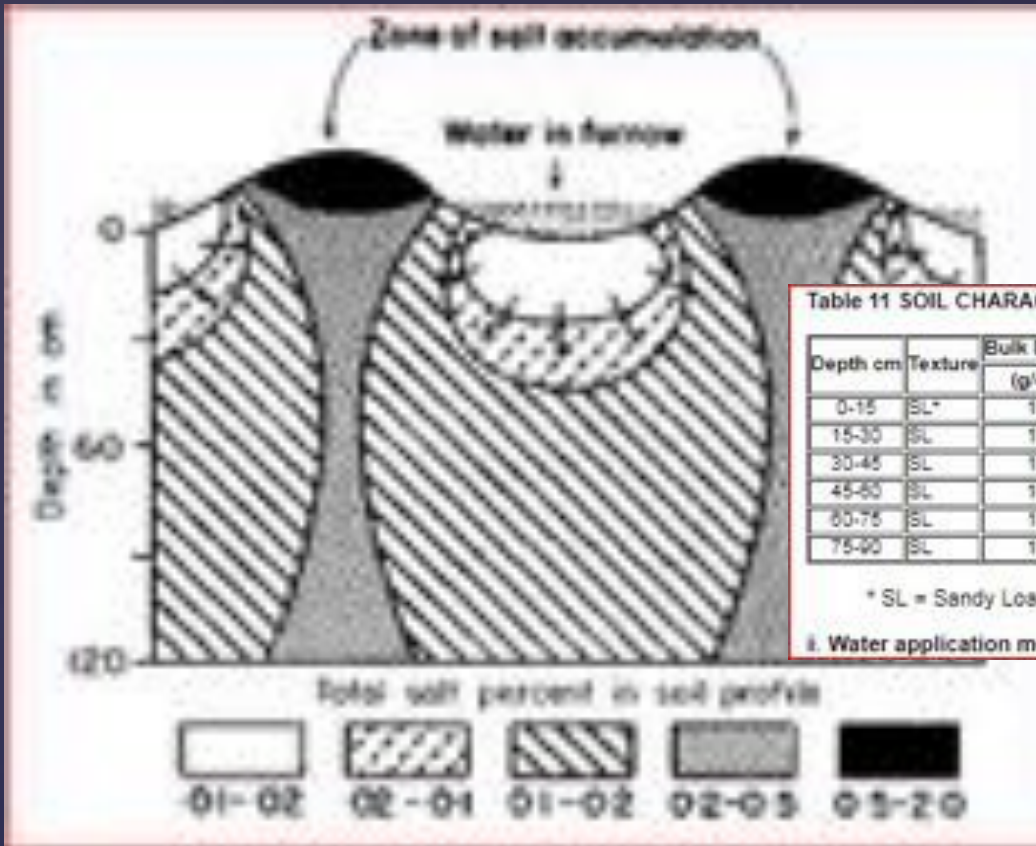


Table 11 SOIL CHARACTERISTICS OF THE LEACHING SITE (Khosla et al., 1979)

Depth cm	Texture	Bulk Density (g/cm <sup>3</sup> )	ECe dS/m	pH <sub>s</sub>	Saturation Extract Composition me/l			SAR
					Na <sup>+</sup>	(Ca+Mg) <sup>2+</sup>	Cl <sup>-</sup>	
0-15	SL*	1.49	63.8	8.1	975	125.7	645	123
15-30	SL	1.61	19.3	7.6	246	48.5	131	50
30-45	SL	1.55	14.0	7.5	184	39.1	74	37
45-60	SL	1.55	12.9	7.8	150	38.1	64	34
60-75	SL	1.55	12.1	7.9	180	38.6	74	41
75-90	SL	1.55	12.2	8.1	142	28.2	67	38

\* SL = Sandy Loam

i. Water application method



# Teheran sewage qanats





## Examples of High sea level activity

Mediterranean sites  
( Presently high & dry miles inland )

Aquilea Cervia pans  
Ostia pans etc





150 billion barrels ?

