

# Challenging the Conventional Advent of Agriculture with a Salt Harvesting Industry of Early Neolithic Hunters

David Bloch

SALT ARCHIVE, M.R.Bloch, 198 BenYehuda Str, 6347215, Israel

**\*Corresponding author**

David Bloch, SALT ARCHIVE, M.R.Bloch, 198 BenYehuda Str, 6347215, Israel.

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## ABSTRACT

Early Neolithic Sapiens “Hunters” developed a sophisticated combination of processing their animal carcasses, tanning hides and skins and enabling salts and osmosis dehydration to sanctify their protein victuals.

Primitive abattoir industry was enabled by the discovered use of critical quantities of common salt produced in open brine irrigated “fields” and accelerated by the corralling of funnel driven wild animal herds in the early Stone Age.

Undissolved salts form where high temperatures and low rainfall create conditions of evaporation and transpiration exceed precipitation. Through capillary action, water containing salts deep in the soil is pulled up to the dry topsoil. As this water evaporates from the soil, the once leached salts are left behind. With no water to dissolve the salts or carry them away, they begin to accumulate in the topsoil.

The growth and “gathering” or farming of salt crystals in fields it is hypothesized, has possibly been misinterpreted as evidence of a much later advanced plant cereal and crop spatial agriculture.

This paper suggests that an earlier Hesiod metallic Sodium Age, cut short the Paleolithic Stone Age, pre-empting Hesiod’s, Copper, Bronze and Iron ages, and arable food cultivation, to first enable the sanctity and purity of sustaining protein meat.

**Keywords:** Monopoly, Religion, Standing Stones, Salt Agriculture, Tilling, NO-Ploughing, Money, Hanging Garden, Hydroponic, Silk Road, Qanat/Karez Sabkha

## Introduction

Hesiod reminds us that the history of mankind’s tool development, evidenced by fossilized animal bone markings, is often divided into two great epochs - the longer ‘Age of Stone’ and the ‘Age of Metal’. The most recent Post Glacial eustatic sea levels forced migration to inland sources of subsistence away from inundated habitats and coastal “sabkhas”. It is proposed here that these early nomadic “hunters” developed sophisticated techniques for capturing and handling their animal carcasses and hides, as precursors to the Neolithic Revolution and plant farming practices.

Paleolithic Hunters followed their prey to the natural salt licks, and the captive herd clearly became such an attraction that a dramatic technique replaced solo animal hunting. Uzi Avner, an archaeologist at Ben-Gurion University, in the Journal of Arid Environments, has suggested that the many long low stone walls

found in many arid zones, are funnel-shaped drive lanes also known as Kites and mustatil killing pits, to drive herds of wild animals, not least huge bison, into capture areas and natural hollows. Some of the 17-thousand-year-old cave art bears some mapping evidence of this technology of handling herds of animals [1-5].

At many ancient sites thought to be ritual, such as Karahan or Gobekli Tepe, it is reported that tens of thousands of wild animal bones have been uncovered, along with evidence of Stone Age tools. At Gobekli alone Joris Peters, a Ludwig Maximilian University researcher of zooarchaeology has investigated 100,000 wild rather than domestic animal fragments.

From single, small hunting groups, this new concerted hunting technology of funnel-driven herds, led to the need for industrial sized abattoir and tanning practices, creating an animistic culture that demanded organized herd domestication, and stone age tools long before Hesiod’s metallic ages.

The Standing stones and megalith Sarsen lintels at many recently discovered sites, with furrows described by Klaus Schmidt and others, were adopted to stretch, cure and expose the huge skins, pelts and mammoth hides to process their tanning and preparation. To make this possible, no less important was the need for huge quantities of salt to enable storage and distribution for transporting these items, perhaps learned from the early use of sea salt to preserve fish.

The crucial factor, the lithic use of common salt, a Basic chemical easily dissolved, limiting its archaeological traces, became essential in curing, dehydrating and preserving perishable items and tanning hides. The salt concentration of dried animal blood and the identical salt of the salt licks became instrumental for these processes. For example the ingredients of tanning “braining” pastes for releasing fats and emulsifying agents may explain finding the use of grinding tools like mortar and pestle, uncovered in quantities at the Tepe sites. Coincidentally, was the development of glazing for firing pre-pottery in a salt making process known as “briquetage”. Another allied precipitated salt, Potassium Chloride, mixed with organic and animal dung supplement, also coincidentally, produced flammable Potassium Nitrate or Saltpeter, a highly secret commodity and later the fame of Petra and “Um-Barak” south of Jericho. Perhaps Prometheus even brought this fire to the sacrificial procedures. Some millennia later it was to be admixed with Dead Sea bitumen as “Greek fire -These products perhaps became the mainstay of a very rich and powerful trading network later known as the “Kings’ Road from Tadmor, Palmyra to Medina [6-10].”

The established Neolithic Salt industry of 3800 BCE makes it possibly the most ancient after the hunters’ tools themselves, allied not only to protein preserving but also to embalming. Salt pools and patches of alkaline earth around the Great Bend of the Huang Ho - Yellow River, and Turpan in the Taklamakan desert were perhaps the most important, most extensive, and productive.

The growing domestication, corralling and processing of animal herds needed industrial quantities of salt. Even more salt was needed in the preserving of carcass parts, which created a surplus of protein and leather accessories available for trading. No less important, was the critical physiological need of a very precise level of consumption to maintain a ratio of 4.8 grams/liter of body fluids per person and for nearly every animal, made it imperative for survival.

The need for such huge quantities of Sodium Chloride from scarce inland natural sources led to the artificial farming and harvesting of precipitated salt in brine evaporation fields and pans. This was enabled initially by gathering and harvesting the salt from natural flat coastal “Sabkha” pools and then the irrigation of artificial pans adapted for the purpose. Coastal evaporation pans still provide 30% of our industrial salt today. With the recent 100-meter post glacial eustatic sea level rise, these pans became unreliable, frequently inundated and dependent upon climate. As Paleolithic hunters were forcibly moved inland, new sources, salt licks and natural pools of brine needed to be discovered and the hunt for common salt became paramount [10-15].

One very ancient development, known as the Qanat or Karez aqueduct, to artificially irrigate inland designated fields in highly

saline endorheic desert basins, simulated these progressively inundated flat coastal sabkha fields.

The Qanat underground aqueducts provided watershed irrigation, a sophisticated technique with a very heavy human investment of extremely complex tunnelling. Architecturally, they have been compared with the Pyramids and the Great Wall of China and today still irrigate to desalinate huge areas of saline alluvial soils.

In Central Asia small early societies sprang up over the ancient “Qanat” matrix of tunnels. Surge flooding leached the saline alluvial soil to produce a brine from which it became possible to precipitate salts by evaporation. It is suggested that these saline desert Endorheic basins, Taklamakan, Kavir and Gobi deserts later supplied salts to the Silk Road and trade routes of the Han dynasty’s Northwest “agricultural” Tuntian fortress oases.

Similarly, the Dead Sea endorheic rift valley, with the Jordan valley watershed, also provided the ideal inland salt making conditions. The Madaba map clearly shows the Dead Sea bulk red salt from the halophilic alga evaporation ponds and grey rock salt from Jebel U’sdom mountain being transported by boat to the Qumran port of a still Pagan Jericho with its fortress perhaps protecting the increasingly valuable salt product, and then possibly transported on to their many “Tepe” hunter clientele of 12000 years ago further north in the Fertile Crescent even competing with the Qanats of North Syria.

This leaching by irrigation technology, was enabled by hundreds and thousands of kilometers of aqueduct tunnels many still in operation, and Qanat tunnels were clearly developed before buildings developed above them. Although dating the invention of Qanats is hard, they appear to be older than 3500 years and invented in Persia.

The Qanats of Northern Syria, or the salt supplies from Jericho, or even juélúowǎn Turpan-China, were hardly affected by the rising ocean post glacial sea levels. Even during later periods of small post glacial eustatic fluctuations these inland sources could still be relied upon to produce minimal, highly monopolized and protected salt.

There followed increased processing consumption of industrial quantities, and salt became the mainstay of hygiene and dietary protocols for any attractive animism of religion. Indeed, so essential were the sources of salt and its supply that they were protected and traded with such powerful leverage that this arguably first intrinsically valued commodity also became monopolized so as to become the first means of exchange and a basic money for any domestic trading.

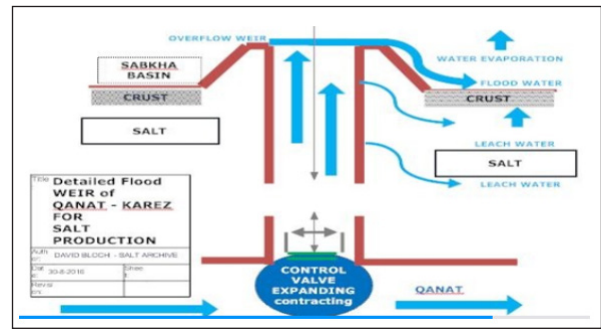
The “Tepe” temple sites may well have had their foundations in the orderly ritual of hygiene and health. As the possible origins of religion they still remain embedded in the practical businesses of pagan Judea and later Judean Jewish HALakha (Hebrew: הלכה, ] followed much later in modern Islam’s HALaal (Arabic: حلال) -derivative [Greek-HALAS ἅλας, ατος, salt] - If these practical rather than ideological theocracies are still dominant and albeit still rivals, it is because many governing regimes in the name of a Religion, primarily represented their congregational constituents in a tenderfoot market economy where most of the

“sacrificial” bulk salt became a powerfully valued commodity. Such a huge relative human investment was needed to build this supply infrastructure, that one can only hardly wonder at the monopolized wealth of the Central Asian cultures that have since become icons of History [16,17].

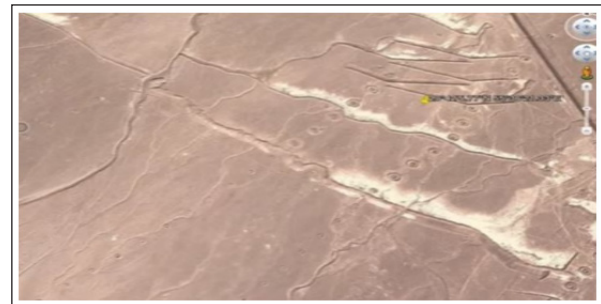
**Conclusion**

The construction of irrigation systems in desert endorheic saline basins simulating Sabhka pools would seem to have developed after “hunters & gatherers” began relocating inland following post glacial rising eustatic sea levels, from inundated coastal salt sources. This required a significant human investment in extreme desert conditions, and we believe constituted the real advent of the Neolithic Revolution and justified the physiological and traded value of increasingly scarce salt products. It was enabled specifically by the development of “salt” farming in Sabkha evaporation fields and pans, by “Qanat”-Karez surge irrigation, to be later converted to plant and food agriculture. The growth of salt crystals in desert fields has been misinterpreted as plant cereal and spatial crop agriculture because desalination of arid zone soils was necessary and even today still desalinates the top soil, today wasting 90% of scarce potable water.

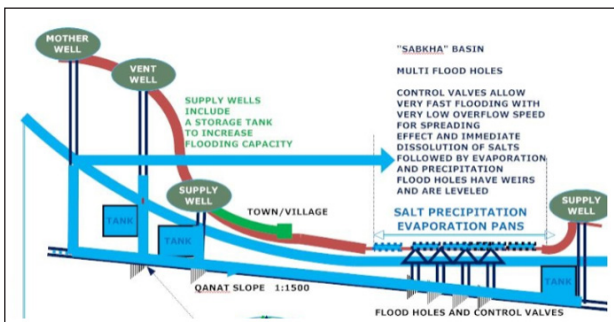
The “Sodium Age” was clearly rooted in the Paleolithic, by Neolithic hunting practices of which “common salt” critical for Osmosis, as an electrolyte, may also have proven pivotal in Sapiens’ segment of our evolution.



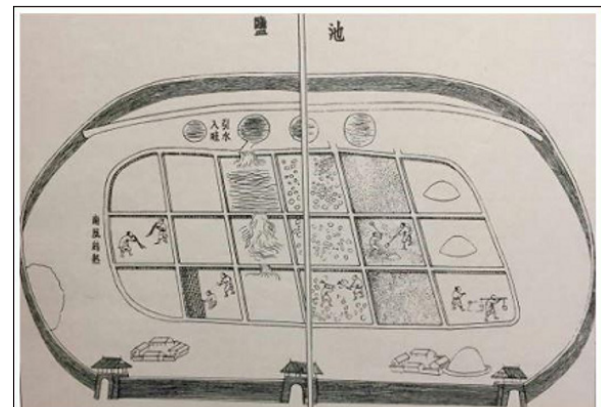
**Figure 3:** Weir system of Qanat holes level flooding [by the author SALT ARCHIVE]



**Figure 4:** Airphoto Google maps - QANAT lines and remains of precipitated salt [presentation slide by the author from Google maps]



**Figure 1:** Qanat, Karez: X-section of watershed streaming aqueduct systems irrigating endorheic alluvial basins. [by the author-SALT ARCHIVE collection]



Prints of Illustrations in the  
 Thien Kung Khai Wan 天工開物  
 (The Exploitation of the Works of Nature)  
 by Sung Ying-Hsing 宋應星 +1637

**Figure 5:** Joseph Needham handwritten notes – regarding The agriculture of Salt and brine Qanat feed holes – from “the Exploitation of the works of Nature by Ay Sung Ying-Hsing- [presentation slide by the author SALT ARCHIVE collection]



**Figure 2:** QANAT Flood holes, supplying leached brine to “fields” for irrigation and evaporation [presentation slide by the author] SALT ARCHIVE



**Figure 6:** “Modern” salt production in the Danakil - as it was “farmed”. [presentation slide by the author SALT ARCHIVE collection]



**Figure 7:** Persian QANAT lines with natural sink holes in between [presentation slide from Google IFP News slide by the author SALT ARCHIVE]

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