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Review Article

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Ethnoarchaeological and Anthropological Evolution of War

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ABSTRACT

Karl Von Clausewitz famously articulated that war is an extension of political policy, highlighting the pivotal role of violence in human history. Historical evidence shows that warfare has been a strategy employed by groups to secure essential resources vital for survival and reproduction. Among these, "common salt" holds a unique position, on par with water, historically influencing political structures and even leading to slavery and conflict.

The human body requires a stable concentration of salt in the bloodstream. Insufficient salt intake activates hormonal mechanisms, mediated by the kidneys, to reduce excretion through urine and sweat. However, these compensatory mechanisms cannot completely mitigate losses. This inherent need for both salt and water arise from the fundamental requirement to sustain precise saline fluid concentrations.

This paper argues that the erratic and unreliable production specifically of “common salt”, has greatly influenced human physiological factors related to reproduction and consequently group survival, often leading to warfare.

Archaeological studies indicate that post-glacial sea level changes have disrupted coastal evaporation techniques, presenting challenges that even Archimedes could not overcome, particularly concerning the energy required to process vast volumes of brine. Such monopolistic behaviours can be traced back to alternative inland salt sources in the arid Kavir deserts of Central Asia, where historically significant trade routes like the Silk Road, and regions that once nurtured some of the earliest civilizations with Qanat, Karez Sabkha technology of natural and manmade induced salt precipitation systems. Although industrial advancements have enabled more consistent salt supplies, the energy demanded for large-scale production remains constrained by monopolistic practices and warfare.

A contemporary illustration of this dynamic is found in recent discoveries of salt giant diapir geology, beneath which lie substantial deep thermal basins that enhance renewable petroleum chemistry and now preferred energy sources like gas. These systems are driven by heavy gravitating saline streams and organic waste accumulating in deep thermal aquifers, challenging the conventional understanding of fossil petroleum's Jurassic age. Such developments threaten the fragile balance of energy supply and demand, both crucial for maintaining the affordability of basics, salt and water.

The historical struggle for cultural control and access to greater quantities of salt and now its energy sources has fostered animosities characterised by hatred, jealousy, and discrimination, stretching from Neolithic hunters and gatherers to the emergence of major religions. These religions processed salt for the preservation and dehydration of hygienic sacrificial animal protein on their altars, first recorded in Jewish kosher Halacha and later in Islamic Halal protocols. This enduring cycle of conflict has often culminated in warfare and may once again lead to renewed hostilities.

Keywords: War, Monopoly, Salt Giant, Physiology, Survival, NLG, Arabic Sabkha (مخبس (Greek ἅλς (HALs), Halite

Common Salt

Salt, a crucial dietary component, is as essential to life as water. The human body relies on a stable concentration of salt to function effectively. Throughout history, common salt has

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emerged not only as a physiological and technological necessity but also as an addictive substance, driving humanity to "risk lives and endure the most disagreeable circumstances" to obtain it from minimal exclusive rock salt sources and solar evaporation Sabkha sites.

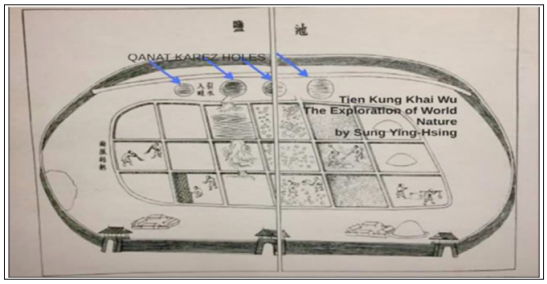


Figure 1: China Sabkha, salt production by Qanat Karez brine extraction and precipitation to pans

The Industrial Revolution significantly increased salt availability by utilizing new fuel sources like coal, moving away from the traditional burning of limited wood and peat [1]. However, these new fuel sources, and later oil and gas, also eventually fell into cartel-like systems, leading to cycles of restricted supply and potential conflict, and reliance on coastal sea level dependent pans.

For nearly a thousand years from the beginning of the Roman Republic, eustatic sea levels rose slowly (Figure1 F to C)—approximately 1.8 m meters—resulting in the intermittent abandonment of new salt pans due to rising tides, which typically facilitated the filling of these pans with sea brine. Today eustatic sea levels are again rising by 2-4 mm per annum [2,3].

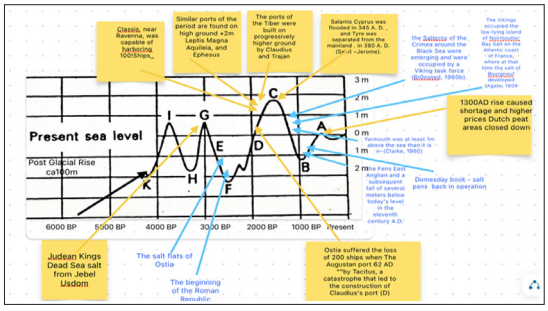


Figure 2: SaltArchive – Eustatic Mediterranean Sea levels based upon evaporation pan access ability to produce Common Salt. (rate of oscillation 2-4mm/year)

Archaeological evidence suggests that the search for new flat coastal landscapes or the very few natural inland brine streams became sources of military friction until industrial-powered chemical plants enabled one of the most important advances of our civilisation, abundant common salt.

While 300 million tons of salt are now easily sourced and manufactured annually, the energy required for such production still poses challenges [4]. The variable costs of energy and the influence of oil and gas cartels continue to threaten the economic stability of nations with limited access to these sources.

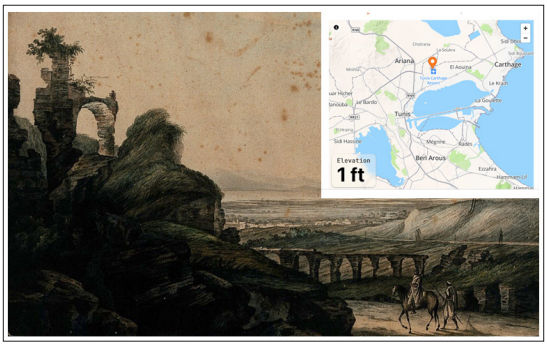
Rudyard Kipling's laws of the jungle notably exclude war, revenge, or punishment, possibly because these concepts inherently imply power dynamics. Only humans possess the capacity to declare war as an extension of policy [5-7]. In contrast, animals engage in violence instinctively to protect themselves or their territories, which may include vital resources such as salt licks and water. They seldom act to prevent access to these resources by other species unless those species pose a direct predatory threat. Humans, however, have learned to isolate and guard limited resources for survival when faced with depletion threats [8]. Historical monopolisation of salt or water sources has often led to warfare, while the absence of such manipulation fosters peace.

The Physiology 4.8 Grams per Litre Fluids

The human body's chemical requirements necessitate a critically stable concentration of salt in the bloodstream. Insufficient salt intake activates hormonal mechanisms to reduce salt excretion through urine and sweat; however, these adaptations cannot fully prevent losses [9,10]. To counteract deficiencies, the body accelerates water secretion to maintain essential blood concentration levels, risking dehydration and death. Conversely, when water is scarce, the body retains water while increasing salt excretion to uphold the vital ratio of 4.8 grams of sodium chloride per litre of bodily fluid—a consistent measurement found in nearly all animals. This innate craving for both salt and water arises from the fundamental need to maintain precise saline fluid concentrations in the body.

Salt Pans & Eustatic Sea Levels

Political forecasts regarding future global conflicts often highlight the potential for "wars" over water rights, which share the same fundamental necessity as salt, though salt has been less ubiquitous throughout history. Common salt, defined as sodium chloride, has often been overlooked in historical discussions [11]. The catastrophic consequences of salt production and eustatic sea level inundation on coastal evaporation Sabkha pans—such as during the Punic Wars—were historically misinterpreted, particularly regarding Carthage. As Roman Ostia's salt pans at the mouth of the Tiber became inundated, Sicily and the North African "sabhka" hinterland became the geopolitical trading reason for Rome to conquer the new salt fields now compatible with the approaching sea level. Hannibal's campaign and later the third Punic war against the resurgence of Carthaginian dominance was perhaps sparked by fear of losing critical salt supplies rather thanthe mythological punishment of "salting" the fields [12].



In contemporary society, both salt and potable water increasingly depend on industrial fuel for consistent production and supply. Throughout history, numerous conflicts have arisen over access to salt resources, underscoring its critical importance [13]. Today,

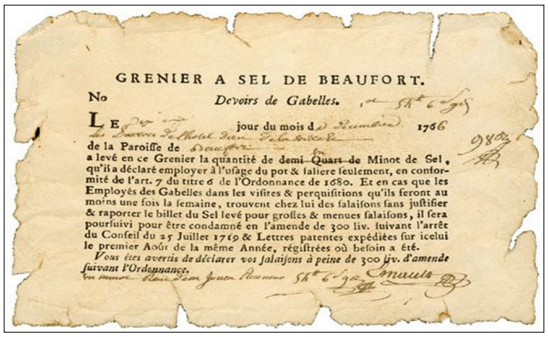
the manipulated availability of industrial fuels, particularly oil and gas, poses a similar threat to the economic survival of those with limited access [14,15].

Major conflicts over the past two millennia can mostly be traced back to competition for essential territorial resources like water and salt—illustrated by trade routes such as the Via Salaria and the Qanat and Karez supplies along the Silk Road. The ongoing Russo-Ukrainian conflict, for example, centres on resources under the Azov Sea, while tensions between Israel and Gaza are deeply rooted in the vast gas reserves located beneath the Eastern Mediterranean's Salt Giant diapir [16]. These future resources are critical for maintaining the marginal pricing of the planet's shift to gas and are leading to warfare.

War and Warfare

Several wars have erupted due to disputes over, or the lack of, either salt, water or the critical energy now needed to ensure them, most notably WW1 and WW2 over the access to fuels oil and gas of the Middle East within the framework of the "Red Line Agreement of 1928. Some Notable examples include:

- The Punic Wars already described but are controversial.
- The Salt Wars (1540): This conflict in the Po River region of Italy involved the Duke of Ferrara's attempt to gain control over valuable salt sources, highlighting the economic importance of salt production.
- The War of the Spanish Succession (1701-1714): While primarily focused on territorial control in Europe, access to salt-rich territories in the Caribbean and Mediterranean became crucial for food preservation and naval superiority.
- The Anglo-Saxon Wars: During the early medieval period, control over salt marshes in England led to various skirmishes and conflicts due to the strategic importance of salt for food preservation.
- The Great Salt March (1930): Led by Mahatma Gandhi against British salt laws, this act of civil disobedience ignited a significant movement for Indian independence, highlighting the British monopoly on salt and saltpetre production and taxation.
- The U.S. Civil War (1861-1865): Salt was vital for both Union and Confederate force, essential for food preservation, making control of saltworks strategically important.
- The War of 1812: Control over salt resources in coastal areas was significant for both the United States and Great Britain in terms of food preservation and military supplies.
- The Gabelle, a tax on salt during the French Revolution, though not a war, was politically violent and centred around the availability of salt and the production of saltpetre explosives.


GRENIER A SEL DE BEAUFORT.

No Devoirs de Gabelles.

LE jour du mois de 1766

de la Paroisse de

a levé en ce Grenier la quantité de demi-Quart de Minot de Sel, qu'il a déclaré employer à l'usage du pot & saliere seulement, en conformité de l'art. 7 du titre 6 de l'Ordonnance de 1680. Et en cas que les Employés des Gabelles dans les visites & perquisitions qu'ils feront au moins une fois la semaine, trouvent chez lui des salaisons sans justifier & raporter le billet du Sel levé pour grosses & menues salaisons, il sera poursuivi pour être condamné en l'amende de 300 liv. suivant l'arrêt du Conseil du 25 Juillet 1719 & Lettres patentes expédiées sur icelui le premier Août de la même Année, régistrées où besoin a été.

Pour être averti de déclarer vos salaisons à peine de 300 liv. d'amende suivant l'Ordonnance.

Secret Salts of War

Delving further into history reveals a pattern of warfare intertwined with the use of highly flammable materials as weapons, such as "Greek fire," a byproduct of salt precipitation mixed with tar and later Saltpetre explosives – Potassium Nitrate a bye product of common salt [17-19].

This created a vicious cycle of "protection" and allied leather armour goods to justify the substantial supplies needed for a no less controversial efficient salting processes of religious sacrifices, facilitating hygienic mass production, distribution and preservation of dehydrated protein meat [20].

The consumption of salted meat by Spartan soldiers before battle had significant physiological and psychological effects, ensuring access to well-preserved, hygienic meat that maintained hydration and electrolyte balance, symbolizing strength and readiness for battle within Spartan society.

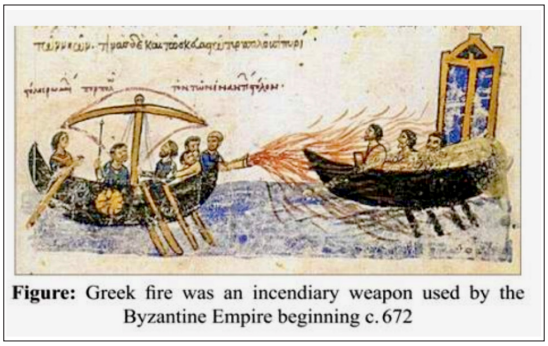


Figure: Greek fire was an incendiary weapon used by the Byzantine Empire beginning c. 672

Peace

If common salt has been an instigator of war, it logically also played a crucial role in peace-making. The language of peace includes terms such as "salaam" and "shalom," which derive from similar linguistic roots associated with salt. The Greek word "hal" (ἅλς), meaning "salt," is etymologically linked to terms denoting peace, primarily due to salt's historical significance in trade and treaties. Place names with the suffix "HAL" are often relevant to religious terms or salt production sites [21]. Other examples include "salvation," stemming from the Latin "salvati," suggesting a state of peace or safety, and "salubrious," derived from "salus," meaning health or well-being, linking salt to concepts of peace and stability.

Conclusion

Over the millennia since the post-glacial low eustatic sea levels, groups of sapiens—from hunters and gatherers to modern oil and gas moguls or their proxies, —have resorted to warfare and even paid "salaries" to protect common salt "via salaria"

trade and, later, its energy needs particularly oil and gas. Both resources have had to meet the exponential demands of a growing population. Technology has gradually found solutions to enable survival and mitigate the dangers of leverage and coercion, though challenges remain. New global climate change and "AI" energy needs are temporarily pushing a shift towards cleaner gas, yet monopolized energy and its cartels continue to threaten global stability, evident in ongoing conflicts in Gaza and Ukraine.

The historical and contemporary significance of common salt extends beyond its role as a dietary staple; it has shaped human civilisation's very fabric, influencing political dynamics, economic structures, and social relationships. The competition for salt has been a powerful catalyst for conflict, leading to wars and struggles over vital resources. The physiological necessity of salt for human survival underscores its importance, as societies have historically fought to secure access to this essential commodity. Not least, religious sacrificial altar rivalries both Semitic and anti-Semitic have played their part in forming sides to ongoing conflict.

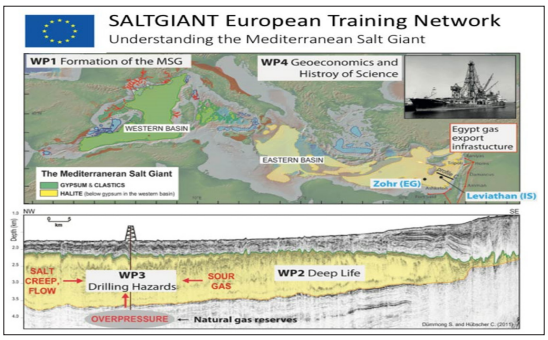


Figure 3: The East Mediterranean diapir of salt and the "teapot effect" of saturated brine flows along the diapir flanks drag seabed organic waste info thermal basins, enabling "pre-salt" petroleum production.

Natural ongoing geological processes, including heavy saturated brine streams that drag organic seabed residues into deep aquifers of salt deposits known as Salt Giants, that gravitate to thermal basins beneath the giant salt diapirs, are supplying the world with new relatively clean natural gas. However, political powers in "Salt Giant" conflicted regions like Gaza and Ukraine exemplify the historical patterns of warfare, where the critical influence of marginal market gas prices and fuel remains paramount to every economy on the planet.

The monopolistic practices surrounding salt production and distribution pose ongoing challenges that mirror past conflicts, particularly in Central Asia's arid zones, and contribute to religious and ethnic animosities. Ironically, the discovery of the world's new Salt Giants—such as those in the Eastern Mediterranean Sea basin, the Gulf of Mexico, the Santos basin or even the even the rich deposits below the Azov Sea basin may have prevented another World War III.

References

1. BLOCH D. HEAVY SALINE STREAMS IN SALT DRIVEN WETLANDS, ABANDONED EVAPORATION PANS, DOMES AND OTHER SALT DEPOSITS AS THE RESPONSIBLE HYDRAULIC MECHANISMS CAUSING THE DISAPPEARANCE OF HEAVY WASTE LIQUIDS, AND OTHER WASTE TOXIC SEDIMENTS ON LAND AND IN THE OCEANS.
2. Bloch MR. A hypothesis for the change of ocean levels depending on the albedo of the polar ice caps. Palaeogeography, Palaeoclimatology, Palaeoecology. 1965. 1:127-142.
3. Clausewitz, Karl von. On War. Translated by Michael Howard and Peter Paret. Princeton University Press, 1976.
4. Diamond, Jared. *Guns, Germs, and Steel: The Fates of Human Societies*. W.W. Norton & Company, 1997.
5. Hurst, Charles. "Salt and the Economic Development of Early Rome." Journal of Roman Archaeology. 1999. 12: 225-246.
6. Wallerstein Immanuel. World-systems analysis: An introduction. World-systems analysis. duke university Press. 2004.
7. Kahn David. The Role of Salt in Ancient Warfare. Military History Quarterly. 2002.. 6: 34-41.
8. Smith, Michael E. Salt and Civilizations: The Role of Salt in the Development of Society. Journal of Anthropological Research. 2012. 68: 1-22.
9. Gandhi, Mahatma. The Collected Works of Mahatma Gandhi. Publications Division, Government of India.1990. 21.
10. Angus Maddison. The world economy: a millennial perspective. 2001.
11. Ruddiman WF. Earth's climate: past and future. Macmillan; 2001.
12. Gunter Anthony. The Geopolitics of Oil and Gas: A Historical Perspective. Energy Policy. 2007. 35:1267-1275.
13. Bowsher Alan. The History of Salt: From Ancient Times to the Present. St. Martin's Press. 2014.
14. Smith Adam. The Wealth of Nations. Edited by Edwin Cannan. Modern Library. 1937.
15. Headrick Daniel R. The Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850-1940. Oxford University Press, 1988.
16. Al-Zahrani, Mohammed. Water Wars: The Conflict Over Water Resources in the Middle East. Middle East Journal of Culture and Communication. 2013. 6: 45-61.
17. Ratzel Friedrich. Political Geography. Translated by J. M. S. Smith. University of California Press. 1897.
18. Herodotus. Histories. Translated by Robin Waterfield. Penguin Classics. 1998.
19. Hobsbawm Eric. The Age of Revolution: Europe 1789-1848. Vintage Books, 1996.
20. Turchin Peter. Historical Dynamics: Why States Rise and Fall. Princeton University Press. 2003.
21. BLOCH MR ZUR. ENTWICKLUNG DER VOM SALZ ABHANGIGEN 8 TECHNOLOGIEN, MITT: LIST GES. BASEL. 289.