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Salt



"The fascinating, indispensable history of an indispensable ingredient . . . a must-have for any serious cook or foodie." —ANTHONY BOURDAIN

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Author of Cod and The Basque History of the World

Salt

A World History

Mark Kurlansky

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To my parents, Roslyn Solomon and Philip Mendel
Kurlansky, who taught me to love books and music

and

to Talia Feiga, who opened worlds while she slept in
the crook of my arm.

The real price of every thing, what every thing really costs to the man who wants to acquire it, is the toil and trouble of acquiring it.

—Adam Smith, *The Wealth of Nations*, 1776

All our invention and progress seem to result in endowing material forces with intellectual life, and in stultifying human life into a material force.

—Karl Marx, *speech*, 1856

Dreams are not so different from deeds as some may think. All the deeds of men are only dreams at first. And in the end, their deeds dissolve into dreams.

—Theodor Herzl, *Old New Land*, 1902

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INTRODUCTION



The Rock

I BOUGHT THE rock in Spanish Catalonia, in the rundown hillside mining town of Cardona. An irregular pink trapezoid with elongated, curved indentations etched on its surface by raindrops, it had an odd translucence and appeared to be a cross between rose quartz and soap. The resemblance to soap came from the fact that it dissolved in water and its edges were worn smooth like a used soap bar.

I paid too much for it—nearly fifteen dollars. But it was, after all, despite a rosy blush of magnesium, almost pure salt, a piece of the famous salt mountain of Cardona. The various families that had occupied the castle atop the next mountain had garnered centuries of wealth from such rock.

I took it home and kept it on a windowsill. One day it got rained on, and white salt crystals started appearing on the pink. My rock was starting to look like salt, which would ruin its mystique. So I rinsed off the crystals with water. Then I spent fifteen minutes carefully patting the rock dry. By the next day it was sitting in a puddle of brine that had leached out of the rock. The sun hit the puddle of clear water. After a few hours, square white crystals began to appear in the puddle. Solar evaporation was turning brine into salt crystals.

For a while it seemed I had a magical stone that would perpetually produce brine puddles. Yet the rock never seemed to get smaller. Sometimes in dry weather it would appear to completely dry out, but on a humid day, a puddle would again appear under it. I decided I could dry out the rock by baking it in a small toaster oven. Within a half hour white stalactites were drooping from the toaster grill. I left the rock on a steel radiator cover, but the brine threatened to corrode the metal. So I transferred it to a small copper tray. A green crust formed on the bottom, and when I rubbed off the discoloration, I found the copper had been polished.

My rock lived by its own rules. When friends stopped by, I told them the rock was salt, and they would delicately lick a corner and verify that it tasted just like salt.

Those who think a fascination with salt is a bizarre obsession have simply never owned a rock like this.



AMONG THE PEOPLE who have apparently lived with such deprivation was the Welsh Jungian psychologist Ernest Jones, friend of Sigmund Freud and a leading force in bringing psychoanalysis to Britain and the United States. In 1912, Jones published an essay about the human obsession with salt—a fixation that he found irrational and subconsciously sexual. To support his theory, he cited the curious Abyssinian custom of presenting a piece of rock salt to a guest, who would then lick it.

Jones states that “in all ages salt has been invested with a significance far exceeding that inherent in its natural properties, interesting and important as these are. Homer calls it a divine substance, Plato describes it as especially dear to the Gods, and we shall presently note the importance attached to it in religious ceremonies, covenants, and magical charms. That this should have been so in all parts of the world and in all times shows that we are dealing with a general human tendency and not with any local custom, circumstance or notion.”

Salt, Jones argued, is often associated with fertility. This notion may have come from the observation that fish, living in the salty sea, have far more offspring than land-based animals. Ships carrying salt tended to be overrun by mice, and for centuries it was believed that mice could reproduce without sex, simply by being in salt.

The Romans, Jones pointed out, called a man in love *salax*, in a salted state, which is the origin of the word *salacious*. In the Pyrenees, bridal couples went to church with salt in their left pockets to guard against impotence. In some parts of France, only the groom carried salt, in others only the bride. In Germany, the bride’s shoes were sprinkled with salt.

Jones further built his case: Celibate Egyptian priests abstained from salt because it excited sexual desire; in Borneo, when Dayak tribesmen returned from taking heads, the abstinence from both sex and salt was required; when a Pima killed an Apache, both he and his wife abstained from sex and salt for three weeks. In Behar, India, Nagin women, sacred prostitutes known as “wives of the snake god,” periodically abstained from salt and went begging. Half their proceeds were given to the priests and half to buying salt and sweetmeats for the villagers.



An 1157 Paris engraving titled *Women Salting Their Husbands demonstrated how to make your man more virile*. The last line of an accompanying poem reads, “With this salting, front and back, At last strong natures they will not lack.” Bibliothèque Nationale

Jones bolstered his argument by turning to Freud, who eight years earlier had asserted in *Zur Psychopathie des Alltagslebens*, *On the Psychopathology of Daily Life*, that superstitions were often the result of attaching great significance to an insignificant object or phenomenon because it was unconsciously associated with something else of great importance.

Would not all this attention to salt be inexplicable, Jones’s argument goes, unless we were really thinking of more important things—things worthy of an obsession? Jones concludes, “There is every reason to think that the

primitive mind equated the idea of salt, not only with that of semen, but also with the essential constituent of urine.”



JONES WAS WRITING in an age with a thirst for scientific explanations. And it is true that semen and urine—along with blood, tears, sweat, and almost every part of the human body— contain salt, which is a necessary component in the functioning of cells. Without both water and salt, cells could not get nourishment and would die of dehydration.

But perhaps a better explanation for the human obsession with this common compound is the one offered a few years later, in the 1920s, by the Diamond Crystal Salt Company of St. Clair, Michigan, in a booklet, “One Hundred and One Uses for Diamond Crystal Salt.” This list of uses included keeping the colors bright on boiled vegetables; making ice cream freeze; whipping cream rapidly; getting more heat out of boiled water; removing rust; cleaning bamboo furniture; sealing cracks; stiffening white organdy; removing spots on clothes; putting out grease fires; making candles dripless; keeping cut flowers fresh; killing poison ivy; and treating dyspepsia, sprains, sore throats, and earaches.

Far more than 101 uses for salt are well known. The figure often cited by the modern salt industry is 14,000, including the manufacturing of pharmaceuticals, the melting of ice from winter roads, fertilizing agricultural fields, making soap, softening water, and dying textiles.

Salt is a chemical term for a substance produced by the reaction of an acid with a base. When sodium, an unstable metal that can suddenly burst into flame, reacts with a deadly poisonous gas known as chlorine, it becomes the staple food sodium chloride, NaCl, from the only family of rocks eaten by humans. There are many salts, and a number of them are edible and often found together. The one we most like to eat is sodium chloride, which has the taste that we call salty. Other salts contribute unwelcome bitter or sour tastes, though they may also be of value to the human diet. Baby formula contains three salts: magnesium chloride, potassium chloride, and sodium chloride.

Chloride is essential for digestion and in respiration. Without sodium, which the body cannot manufacture, the body would be unable to transport nutrients or oxygen, transmit nerve impulses, or move muscles, including the heart. An adult human being contains about 250 grams of salt, which would fill three or four salt-shakers, but is constantly losing it through bodily functions. It is essential to replace this lost salt.

A French folktale relates the story of a princess who declares to her father, “I love you like salt,” and he, angered by the slight, banishes her from the kingdom. Only later when he is denied salt does he realize its value and therefore the depth of his daughter’s love. Salt is so common, so easy to obtain, and so inexpensive that we have forgotten that from the beginning of civilization until about 100 years ago, salt was one of the most sought-after commodities in human history.



SALT PRESERVES. UNTIL modern times it provided the principal way to preserve food. Egyptians used salt to make mummies. This ability to preserve, to protect against decay, as well as to sustain life, has given salt a broad metaphorical importance—what Freud might have considered an irrational attachment to salt, a seemingly trivial object, because, in our unconscious, we associate it with longevity and permanence, which are of boundless significance.

Salt was to the ancient Hebrews, and still is to modern Jews, the symbol of the eternal nature of God’s covenant with Israel. In the Torah, the Book of Numbers, is written, “It is a covenant of salt forever, before the Lord,” and later in Chronicles, “The Lord God of Israel gave the kingdom over Israel to David forever, even to him, and to his sons, by a covenant of salt.”

On Friday nights Jews dip the Sabbath bread in salt. In Judaism, bread is a symbol of food, which is a gift from God, and dipping the bread in salt preserves it—keeps the agreement between God and his people.

Loyalty and friendship are sealed with salt because its essence does not change. Even dissolved into liquid, salt can be evaporated back into square crystals. In both Islam and Judaism, salt seals a bargain because it is

immutable. Indian troops pledged their loyalty to the British with salt. Ancient Egyptians, Greeks, and Romans included salt in sacrifices and offerings, and they invoked gods with salt and water, which is thought to be the origin of Christian holy water.

In Christianity, salt is associated not only with longevity and permanence but, by extension, with truth and wisdom. The Catholic Church dispenses not only holy water but holy salt, *Sal Sapientia*, the Salt of Wisdom.

Bread and salt, a blessing and its preservation, are often associated. Bringing bread and salt to a new home is a Jewish tradition dating back to the Middle Ages. The British dispensed with the bread but for centuries carried salt to a new home. In 1789, when Robert Burns moved to a new house in Ellisland, he was escorted there by a procession of relatives carrying a bowl of salt. The city of Hamburg, Germany, symbolically renews its blessings once a year by carrying through the streets a chocolate-covered bread and a marzipan saltcellar filled with sugar. In Welsh tradition, a plate was put on the coffin with bread and salt, and a local professional sin eater arrived to eat the salt.

Because salt prevents decay, it protects from harm. In the early Middle Ages, farmers in northern Europe learned to save their grain harvest from a devastating fungal infection called ergot, poisonous to humans and livestock, by soaking the grain in salt brine. So it is not surprising that Anglo-Saxon farmers included salt in the magic ingredients placed in a hole in the plow as they invoked the name of the earth goddess and chanted for “bright crops, broad barley, white wheat, shining millet ...”

Evil spirits detest salt. In traditional Japanese theater, salt was sprinkled on the stage before each performance to protect the actors from evil spirits. In Haiti, the only way to break the spell and bring a zombie back to life is with salt. In parts of Africa and the Caribbean, it is believed that evil spirits are disguised as women who shed their skin at night and travel in the dark as balls of fire. To destroy these spirits their skin must be found and salted so that they cannot return to it in the morning. In Afro-Caribbean culture, salt’s ability to break spells is not limited to evil spirits. Salt is not eaten at ritual meals because it will keep all the spirits away.

Both Jews and Muslims believe that salt protects against the evil eye. The Book of Ezekial mentions rubbing newborn infants with salt to protect them from evil. The practice in Europe of protecting newborns either by putting salt on their tongues or by submerging them in saltwater is thought to predate Christian baptism. In France, until the practice was abolished in 1408, children were salted until they were baptized. In parts of Europe, especially Holland, the practice was modified to placing salt in the cradle with the child.

Salt is a potent and sometimes dangerous substance that has to be handled with care. Medieval European etiquette paid a great deal of attention to how salt was touched at the table—with the tip of a knife and never by hand. In the most authoritative book of Jewish law, the *Shulchan Arukh*, The Prepared Table, written in the sixteenth century, it is explained that salt can only safely be handled with the middle two fingers. If a man uses his thumb in serving salt, his children will die, his little finger will cause poverty, and use of the index finger will cause him to become a murderer.



MODERN SCIENTISTS ARGUE about how much salt an adult needs to be healthy. Estimates range from two-thirds of a pound to more than sixteen pounds each year. People who live in hot weather, especially if they do physical labor, need more salt because they must replace the salt that is lost in sweating. This is why West Indian slaves were fed salted food. But if they do not sweat excessively, people who eat red meat appear to derive from it all the salt they need. The Masai, nomadic cattle herders in East Africa, meet their salt needs by bleeding livestock and drinking the blood. But vegetable diets, rich in potassium, offer little sodium chloride. Wherever records exist of humans in different stages of development, as in seventeenth- and eighteenth-century North America, it is generally found that hunter tribes neither made nor traded for salt but agricultural tribes did. On every continent, once human beings began cultivating crops, they began looking for salt to add to their diet. How they learned of this need is a mystery. A victim of starvation experiences hunger, and so the need for food is apparent. Salt deficiency causes headaches and weakness, then light-headedness, then nausea. If deprived long enough, the victim will die. But at no time in this process is a craving for salt experienced. However, most

people choose to eat far more salt than they need, and perhaps this urge—the simple fact that we like the taste of salt—is a natural defense.

The other development that created a need for salt was the move to raise animals for meat rather than kill wild ones. Animals also need salt. Wild carnivores, like humans, can meet their salt needs by eating meat. Wild herbivores forage for it, and one of the earliest ways humans searched for salt was to follow animal trails. Eventually they all lead to a salt lick or a brine spring or some other source of salt. But domesticated animals need to be fed salt. A horse can require five times the salt intake of a human, and a cow needs as much as ten times the amount of salt a human requires.

Attempts to domesticate animals may have occurred before the end of the Ice Age, and even then humans understood that animals needed salt. Reindeer were observed going to encampments where human urine provided a source of salt. People learned that if salt was provided, the reindeer would come to them and eventually be tamed. But though these animals became a source of food, they never became truly domesticated animals.

Around 11,000 B.C., the Ice Age ended, and vast sheets of ice that covered much of the known world, including what is today New York and Paris, began to shrink and slowly vanish. At about this time the Asiatic wolf, a fierce predator that despite its small size would eat a human if it had the opportunity, came under human control because its friendly young cubs could be fed and trained. A dangerous adversary was turned into a dedicated helper—the dog.

As glaciers melted, huge fields of wild grain appeared. Humans, but also wild sheep and goats, fed on these fields. The initial human reaction was probably to kill these animals that threatened their food supply. But tribes living near such fields soon realized that sheep and goats could become a dependable food source if they could control them. Their dogs could even help in this work. By 8900 B.C., sheep were domesticated in Iraq, though they may have been domesticated in other places even earlier.

Around 8000 B.C., women in the Near East began planting seeds of wild grains in cleared fields. This is usually thought to have been the beginning of

agriculture. But in 1970, a University of Hawaii expedition to Burma, now known as Myanmar, reported finding in a place called Spirit Cave the remnants of what seemed to be cultivated vegetables—peas, water chestnuts, and cucumbers—carbon-dated to the year 9750 B.C.

Pigs came later, about 7000 B.C., because they would not simply graze on grass, and it took time to see the benefit of keeping animals for whom food had to be gathered. It was not until about 6000 B.C. in Turkey or the Balkans that people successfully carried out the daunting task of domesticating the large, fast, and powerful aurochs. Through controlling their diet, castrating males, and corralling the animals into constricted spaces, people eventually turned the wild aurochs into cattle. Cattle became a mainstay food, consuming huge quantities of both grain and salt. The aurochs, fast-footed and ferocious, were hunted into extinction by the mid-seventeenth century.

Where people ate a diet consisting largely of grains and vegetables, supplemented by the meat of slaughtered domestic farm animals, procuring salt became a necessity of life, giving it great symbolic importance and economic value. Salt became one of the first international commodities of trade; its production was one of the first industries and, inevitably, the first state monopoly.



THE SEARCH FOR salt has challenged engineers for millennia and created some of the most bizarre, along with some of the most ingenious, machines. A number of the greatest public works ever conceived were motivated by the need to move salt. Salt has been in the forefront of the development of both chemistry and geology. Trade routes that have remained major thoroughfares were established, alliances built, empires secured, and revolutions provoked—all for something that fills the ocean, bubbles up from springs, forms crusts in lake beds, and thickly veins a large part of the earth's rock fairly close to the surface.

Almost no place on earth is without salt. But this was not clear until revealed by modern geology, and so for all of history until the twentieth century, salt was desperately searched for, traded for, and fought over. For

millennia, salt represented wealth. Caribbean salt merchants stockpiled it in the basements of their homes. The Chinese, the Romans, the French, the Venetians, the Hapsburgs, and numerous other governments taxed it to raise money for wars. Soldiers and sometimes workers were paid in salt. It was often used as money.

In his 1776 treatise on capitalism, *The Wealth of Nations*, Adam Smith pointed out that almost anything of value could be used for money. He cited as examples tobacco, sugar, dried cod, and cattle and stated that “salt is said to be a common instrument of commerce and exchanges in Abyssinia.” But he offered the opinion that the best currency was made of metal because it was physically durable, even if its value was as ephemeral as other commodities.

Today, thousands of years of coveting, fighting over, hoarding, taxing, and searching for salt appear picturesque and slightly foolish. The seventeenth-century British leaders who spoke with urgency about the dangerous national dependence on French sea salt seem somehow more comic than contemporary leaders concerned with a dependence on foreign oil. In every age, people are certain that only the things they have deemed valuable have true value.

The search for love and the search for wealth are always the two best stories. But while a love story is timeless, the story of a quest for wealth, given enough time, will always seem like the vain pursuit of a mirage.

PART ONE

A Discourse on Salt, Cadavers, and Pungent Sauces

A country is never as poor as when it seems filled with riches.

*—Laozi quoted in the Yan tie lun,
A Discourse on Salt and Iron, 81 B.C.*

CHAPTER ONE



A Mandate of Salt

ONCE I STOOD on the bank of a rice paddy in rural Sichuan Province, and a lean and aging Chinese peasant, wearing a faded forty-year-old blue jacket issued by the Mao government in the early years of the Revolution, stood knee deep in water and apropos of absolutely nothing shouted defiantly at me, “We Chinese invented many things!”

The Chinese are proud of their inventions. All Chinese leaders, including Mao Zedong, sooner or later give a speech listing the many Chinese firsts. Though rural China these days seems in need of a new round of inventions, it is irrefutably true that the Chinese originated many of the pivotal creations of history, including papermaking, printing, gunpowder, and the compass.

China is the oldest literate society still in existence, and its 4,000 years of written history begin as a history of inventions. It is no longer clear when legends were made into men and when living historic figures were turned into legends. Chinese history starts in the same manner as Old Testament history. In the Book of Genesis, first come the legends, the story of the Creation, mythical figures such as Adam and Eve and Noah, generations of people who may or may not have lived, and gradually the generations are followed to Abraham, the beginning of documented Hebrew history.

In Chinese history, first was Pangu, the creator, who made humans from parasites on his body. He died but was followed by wise rulers, who invented the things that made China the first civilization. Fuxi was first to domesticate animals. Apparently an enthusiast for domesticity, he is also credited with inventing marriage. Next came Shennong, who invented medicine, agriculture, and trade. He is credited with the plow and the hoe. Then came Huangdi, the Yellow Emperor, who invented writing, the bow and arrow, the cart, and ceramics. Several centuries after Huangdi came Emperor Yao, a wise ruler who passed over his unqualified son and named a modest sage,

Shun, his successor. Shun chose his minister, Yu, to succeed him. In 2205 B.C., according to tradition, Yu founded the Xia dynasty, and this dynasty, which lasted until 1766 B.C., enters into documented history.



CHINESE SALT HISTORY begins with the mythical Huangdi, who invented writing, weaponry, and transportation. According to the legends, he also had the distinction of presiding over the first war ever fought over salt.

One of the earliest verifiable saltworks in prehistoric China was in the northern province of Shanxi. In this arid region of dry yellow earth and desert mountains is a lake of salty water, Lake Yuncheng. This area was known for constant warfare, and all of the wars were over control of the lake. Chinese historians are certain that by 6000 B.C., each year, when the lake's waters evaporated in the summer sun, people harvested the square crystals on the surface of the water, a system the Chinese referred to as "dragging and gathering." Human bones found around the lake have been dated much earlier, and some historians speculate that these inhabitants may also have gathered salt from the lake.

The earliest written record of salt production in China dates to around 800 B.C. and tells of production and trade of sea salt a millennium before, during the Xia dynasty. It is not known if the techniques described in this account were actually used during the Xia dynasty, but they were considered old ways by the time of this account, which describes putting ocean water in clay vessels and boiling it until reduced to pots of salt crystals. This was the technique that was spread through southern Europe by the Roman Empire, 1,000 years after the Chinese account was written.

About 1000 B.C., iron first came into use in China, though the first evidence of it being used in salt making is not until 450 B.C. by a man named Yi Dun. According to a passage written in 129 B.C. , "Yi Dun rose to prominence by producing salt in pans." Yi Dun is believed to have made salt by boiling brine in iron pans, an innovation which would become one of the leading techniques for salt making for the next 2,000 years. The legend says that he worked with an ironmaster named Guo Zong and was also friendly with an enterprising wealthy bureaucrat named Fan Li. Fan Li is credited