

Great Events from History

The 18th Century

1701-1800

18th century**EXPANSION OF THE ATLANTIC SLAVE TRADE**

Benefiting from the complicity of European nations, the Atlantic slave trade expanded dramatically during the eighteenth century. This development set the stage for the mass transportation of Africans to the Americas, with more than 70 percent of all slaves arriving in the New World after 1700. Although an antislavery movement emerged in the late eighteenth century, economic influences obstructed its effectiveness.

LOCALE: West Africa; New World colonies

CATEGORIES: Trade and commerce; economics; social issues and reform; colonization

KEY FIGURES

John Hawkins (1532-1595), the first Englishman to trade in slaves between West Africa and the West Indies

Charles Pinckney (1757-1824), adviser to George Washington and a powerful political figure who argued that slavery was necessary in the colonies

William Wilberforce (1759-1833), leader of the Society for the Abolition of the Slave Trade

SUMMARY OF EVENT

Portugal, which established the Atlantic slave trade in the mid-fifteenth century and remained its dominant force until the beginning of the eighteenth century, enslaved thousands of Africans for work on sugar plantations in Brazil. Operating on a limited scale initially, the trade increased after Christopher Columbus made his voyage in 1492 and opened the New World to Europeans. Beginning in the 1550's, the Spanish transported Africans into their Central American and South American colonies. The French and the Dutch entered the trade in the 1650's to provide workers for their holdings in the Caribbean.

In 1562, British admiral John Hawkins inaugurated the British slave trade by profitably transporting African captives during a three-year period (through 1565) to Caribbean colonies claimed and ruled by the Spanish. Because of Spain's objections to this encroachment on its territory, England remained on the sidelines for another century. In the mid-1600's the demand for labor in Britain's Caribbean and North American colonies prompted British investors to enter the trade. By the beginning of the eighteenth century, England ruled the slave market, with both British seamen and those from the New En-

gland colonies pursuing the lucrative business. Great Britain and other European countries transported approximately three million Africans to the New World during the 1600's. The next century saw that number double. It is estimated that eleven million Africans were enslaved and transported to the Americas and the Caribbean during the entire course of the slave trade.

The leaders of the various nations considered slaves essential to the expansion of their far-flung colonies, which produced profitable and popular commodities such as sugar, coffee, and tobacco. Charles Pinckney, a prominent politician, slaveholder, and close associate of George Washington, summed up his belief in the economic necessity of slavery by calling African slaves raw materials that were essential for planters to cultivate their land. Others involved in the trade justified the practice by arguing that slavery figured in the divine plan. By "rescuing" Africans from savagery and converting them to Christianity, they believed they were doing God's work.

Considering the competitive nature of the trade, an endless series of disputes and clashes took place on the high seas and at various ports when one nation would accuse another of infringing on its territory. By winning the Seven Years' War (1756-1763) they fought against France, the British gained several French colonies in the Caribbean. Earlier, Great Britain faced the brutal First Maroon War in Jamaica when the British attempted to take the colony from Spain in 1730. The *asiento de negros*, established by the Spanish in the 1600's, added to the complications. The *asiento* was essentially a license issued for a fee to supply slaves to a specific colony, but it was not always a guarantee against disputes. Slave uprisings and rebellions in Saint Vincent, Grenada, and Saint Domingue (which became Haiti in 1804) caused additional problems. Africa, too, faced upheavals brought by the slave trade. The unceasing demand for captives led to skirmishes between the coastal Africans who profited from the trade and those who lived in central Africa, the area from which most of the slaves were drawn.

Much has been recorded about the horrific conditions on what is known as the Middle Passage—the lengthy sea journey between Africa's west coast and the Americas. Even though the human "cargo" was extremely valuable, the captives faced poor sanitary conditions, little if any medical attention, and inadequate types and amounts of food. As a result, many died during the first

DEALING IN SLAVES

Dutch West India Company employee William Bosman, the company's chief factor, or European agent, at Elmina along the Guinea Coast in West Africa in the late seventeenth and early eighteenth century, documented slave dealing. Slave dealing and trading included the cooperation of local African chiefs, who would receive customs duty in exchange for giving the Europeans the right to buy slaves. The language here clearly evokes the "commodity" status of the African captives.

When these slaves come to Fida [in present-day Dahomey], they are put in Prison all together, and when we treat concerning buying them, they are all brought together in a large Plain; where by our Chirurgeons [surgeons], whose Providence it is, they are thoroughly examined, even to the smallest Member, and that naked too both Men and Women, without the least Distinction or Modesty. Those which are approved as good are set on one side; and the lame or faulty are set by as *Invalides*, which are here called *Mackrons*. . . .

The *Invalides* and the Maimed being thrown out . . . the remainder are numbered, and it is entered who delivered them. In the meanwhile, a burning Iron with the Arms or Name of the Companies, lyes in the Fire; with which ours are marked on the Breast. . . .but we yet take all possible care that they are not burned too hard, especially the Women who are more tender then the Men.

We are seldom long detained in the buying of these Slaves, because their price is established, the Women being . . . cheaper than the Men. . . . When we have agreed with the Owners of the Slaves, they are returned to their Prison.

Source: William Bosman, "A New and Accurate Description of Guinea" (1705), excerpted in *The Horizon History of Africa*, edited by Alvin M. Josephy, Jr. (New York: American Heritage, 1971), p. 335.

phase of their bondage. In some instances, the slave traders threw the sick overboard to prevent the spread of disease. One ship's physician described how the deck, where hundreds of slaves were chained, was covered with blood, mucus, and excrement—a scene he found so repugnant that it lay beyond human imagination. After arriving in a foreign port, the dejected and frightened survivors faced humiliating auctions, where prospective buyers judged the survivors as if they were livestock.

Although England captured the market in the 1700's, it would also lead the movement to end slave trading. Initial efforts concentrated on ending the trade, not slavery itself, even though that remained the ultimate goal of the Society for the Abolition of the Slave Trade (formed in 1787). Two years later, William Wilberforce joined the society. He was influenced by John Newton, a former slave trader who had experienced a dramatic conversion that led him into the ministry and into the abolition movement.

After years of urging the British parliament to abolish the trade, Wilberforce finally succeeded: In 1807 both

houses passed a law ending the transportation of slaves from Africa to the Caribbean and North American colonies. This act, which was influenced in part by economic circumstances, caused ripples throughout the European community, and one by one other nations followed suit. In the next few years most European nations abolished slavery as well, and, in 1833, the British parliament halted the practice throughout its global empire. The slave trade continued on a limited scale until Brazil and Cuba were pressured during the 1860's into banning the importation of slaves.

SIGNIFICANCE

The expansion of the slave trade marked a significant point in world history, but the stain it left did not miraculously vanish with its demise beginning in the early nineteenth century. The practice had long-lasting effects on both the slaves and their "masters." The immediate impact was economic. Because the wealth Great Britain and other European nations gained through their colonial

ventures relied on slave labor, abolition deprived plantation owners of their most vital resource. As a result, various forms of slavery and slave trading continued not only in the United States, where it was not abolished until 1863, but in other regions as well.

From the outset, African slaves had not been docile in their captivity. Uprisings took place in the 1700's, and the resistance continued into the nineteenth century, with bands of runaway and freed slaves sabotaging plantations. At the same time, the freed slaves who wanted to settle and take advantage of the prosperity they had helped create found themselves outcasts and lived in conditions little different from enslavement. Although slavery had faded into the past, it was replaced by racism—a new form of bondage that was to have lasting consequences.

Africa's role in the slave trade helped to determine the continent's destiny. Through alliance with Great Britain and European countries, the coastal slave traders inadvertently opened up Africa to colonial exploitation. Once the overseas scramble for the continent succeeded, the

empire builders no longer transported Africans into bondage but enslaved them on their own land.

—Robert Ross

FURTHER READING

- Andrews, William L., and Henry Louis Gates, Jr., eds. *Slave Narratives*. New York: Library of America, 2000. This work presents ten slave narratives, first published between 1772 and 1864.
- Blackburn, Robin. *The Making of New World Slavery*. New York: Verso, 1997. Blackburn traces the institution of slavery from the ancient world to its reemergence in the mid-fifteenth century through 1800.
- Grant, R. G. *The African-American Slave Trade*. Huppauge, N.Y.: Barron's, 2003. Grant provides an excellent introduction to the history of slavery through a readable, brief text. Includes good illustrations.
- Klein, Herbert S. *The Atlantic Slave Trade*. New York: Cambridge University Press, 1999. Klein surveys the economic, social, cultural, and political ramifications of the slave trade.
- Monaghan, Tom. *The Slave Trade*. New York: Raintree Steck-Vaughn, 2003. Monaghan surveys the development of the transatlantic slave trade, slave practices in the Americas, and slavery's legacy. Includes extensive illustrations.
- Streissguth, Thomas, ed. *Slavery*. San Diego, Calif.: Greenhaven Press, 2001. An anthology containing documents by historical figures and scholars examining the slave trade, with articles on foreign perspectives, life in bondage, the abolition debate, and instances of defiance, rebellion, and escape.
- Thomas, Hugh. *The Slave Trade*. New York: Simon & Schuster, 1997. This 900-page volume explores the complete history of the Atlantic slave trade, with details on its beginnings and internationalization, graphic descriptions of the voyages, and an account of the ab-

olition movement. The most complete study available.

Walvin, James. *Black Ivory: A History of British Slavery*. Washington, D.C.: Howard University Press, 1994. Walvin compares slavery in the Americas with slavery in the Caribbean, tracing the development of the trade and its economic roots, the transport of human cargo, and the life of slaves in the colonies.

_____. *Making the Black Atlantic: Britain and the African Diaspora*. London: Cassell, 2000. Walvin stresses Great Britain's crucial role not only in the slave trade but in the abolition movement as well. Points out that slavery laid the economic foundations of the modern world and continues to exert influence on racial attitudes.

SEE ALSO: Sept., 1720: Collapse of the South Sea Bubble; 1730-1739: First Maroon War; Nov. 23, 1733: Slaves Capture St. John's Island; Sept. 9, 1739: Stono Rebellion; Jan. 24, 1744-Aug. 31, 1829: Dagohoy Rebellion in the Philippines; 1760-1776: Caribbean Slave Rebellions; Apr. 14, 1775: Pennsylvania Society for the Abolition of Slavery Is Founded; July 2, 1777-1804: Northeast States Abolish Slavery; 1780-1781: Rebellion of Tupac Amaru II; Apr. 12, 1787: Free African Society Is Founded; Aug. 22, 1791-Jan. 1, 1804: Haitian Independence; Mar. 16, 1792: Denmark Abolishes the Slave Trade; Feb. 12, 1793: First Fugitive Slave Law; July, 1795-Mar., 1796: Second Maroon War.

RELATED ARTICLES in *Great Lives from History: The Eighteenth Century, 1701-1800*: Benjamin Banneker; Joseph Boulogne; Olaudah Equiano; Benjamin Franklin; First Earl of Mansfield; Nanny; Guillaume-Thomas Raynal; Benjamin Rush; Samuel Sewall; Granville Sharp; Toussaint Louverture; George Washington; Phillis Wheatley; William Wilberforce.

c. 1701

OMAN CAPTURES ZANZIBAR

Portugal's decline during the 1600's led to cracks in its control of East Africa. Oman took advantage of Portugal's weakness to seize Zanzibar by 1701, effectively ending Lisbon's rule north of Mozambique.

LOCALE: Zanzibar (now in Tanzania, Kenya, and Somalia)

CATEGORIES: Expansion and land acquisition; wars, uprisings, and civil unrest

KEY FIGURES

Saif I ibn Sulṭān (d. 1711), imam of Oman, r. 1692-1711

Sulṭān bin Saif (d. 1688), imam of Oman, r. 1649-1688

Bal'arab bin Sulṭān (d. 1692), imam of Oman, r. 1688-1692

SUMMARY OF EVENT

For centuries the richest place in Africa, Zanzibar was the lucrative hub of trade routes between Africa, Arabia, and India, supplying slaves, gold, ivory, spices, tortoiseshell, and mangrove poles in exchange for textiles, metalwork, and glass. From the eighth century onward, lateen-rigged wooden sailing ships, or *dhows*, used trade winds to sail northeast to India and Persia during the spring and summer, then back in the autumn and winter.

The eighteenth century region of Zanzibar included what is now Zanzibar Island, as well as portions of modern Kenya and Somalia, but the island of Zanzibar was its center. Locally known as Unguja, Zanzibar is a limestone island, fifty-three miles north to south and twenty-four miles east to west. It is located in the Indian Ocean some forty miles by boat from Dar es Salaam, the modern capital of Tanzania. Arabs called the eastern African coast and its adjacent islands Zinj el Barr, or "Land of the Blacks." This served as a general designation until the late 1400's, after which the name was used only for Unguja. Historically tied to Zanzibar are Pemba Island, which lies about thirty miles north, and the smaller Mafia Island seventy-five miles south. As Zanzibar is located 6 degrees south of the equator, hot, humid weather moderated by frequent breezes prevails. Heavy rains from March to May and lesser rains in October and November water the region.

Portuguese navigator Vasco da Gama landed in Oman on his way to India in 1498 and visited Zanzibar on his return voyage. At that time, the most important place in East Africa was the Shirazi gold trading center of Kilwa,

built a mile off the coast in the 1200's. The accounts of both fourteenth century Arab traveler Ibn Baṭṭūṭah and sixteenth century Portuguese sailors attest to Kilwa's importance. Lisbon gained control of Zanzibar; soon conquered Kilwa, Pemba, Mombasa, Lamu, and Hormuz; and sacked Muscat. Gold trading was rerouted, and Kilwa declined. However, far from its European base, Portugal's far-flung empire was challenged by Omani Arabs, who had plied the Indian Ocean from the eastern end of the Arabian peninsula for centuries.

Oman's imams, often mistakenly called sultans, ruled from the inland mountain fortress of Rostaq. However, increasing interest in seaborne trade and naval power led them to focus on Muscat, their main port and eventually their capital. In 1649, Imam Sulṭān bin Saif defeated the Portuguese at Muscat and chased them to India. The ships he captured proved superior to his *dhows* in fire-power and formed the core of a rebuilt Omani navy. Following his victory, the imam, bolstered by ten thousand soldiers and twenty-eight ships, arrived in Zanzibar to aid the island's exiled Queen Mwana wa Mwana. Sacking Portuguese settlements on Zanzibar and Pemba, he took four hundred prisoners. The Portuguese dead included Viceroy Manoel de Nazereth. Before returning to Oman, Sulṭān bin Saif appointed a member of the El-Harthy family to rule Zanzibar.

Sulṭān bin Saif had come to power in accordance with a nine-hundred-year-old tradition of elections. However, his dying decree handed power to his son, Bal'arab bin Sulṭān. Thus began Oman's hereditary succession. Sulṭān's descendants, the Ya'rubī Dynasty, established a trading empire stretching from Kilwa in east Africa to Gwadar in present-day Pakistan. However, the Portuguese challenge continued. In 1686, Portugal had captured and executed the Sultan of Pate. Delegations from both Pate and the Shirazi of Zanzibar went to Muscat seeking help from Imam Saif I ibn Sulṭān as a fellow Muslim.

Between 1696 and 1698, the Omanis under Saif I ibn Sulṭān expelled the Portuguese from Zanzibar Island, captured Fort Jesus in Mombasa, and stormed the Portuguese fortress on Pate, forcing the Europeans to withdraw south to Mozambique. An exact date of the final demise of Portuguese power in Zanzibar is debatable, but the Omanis were clearly in control of the coast north of Mozambique by 1701, by which time Zanzibar Island had become an Omani stronghold.

The island's defenses were strengthened with the completion of a fort armed with cannon from Sulṭān bin Saif's eighty-gun flagship *Al-Falaq* (the dawn). Built between 1698 and 1701 on the ruins of a Portuguese chapel, this quadrilateral fort dominated the town with high, dark brown walls topped by crenellated battlements and turrets. From here, the Omanis controlled one thousand miles of the mainland coast from Somalia to Mozambique.

The Arab hold on the area was consolidated with the establishment of a trading post, garrison, and prison on Kilwa. Portuguese attempts to recolonize Mombasa in 1699, 1703, and 1710 failed. Queen Mwana wa Mwana returned to Zanzibar from Yemen in 1710. However, her successors were overshadowed by Omani governors. Small and easy to defend, the islands provided ideal bases for the Arabs, who had learned well from their enemies.

While Zanzibar's Arabs continued to pay allegiance to governors appointed by the imam in Muscat, they enjoyed much autonomy. The mainstay of their economy was trade. Arab caravans reached into Africa's interior, a lucrative area for slaves and ivory. Over a period of almost four centuries, between 700,000 and 1.2 million slaves were taken from the mainland. Numbering sixty-five hundred per year by 1834, slaves from as far away as Malawi and Uganda were shipped through Zanzibar to the Middle East and India. Most wealth remained in the hands of Omani landowners and traders, who isolated themselves and seldom intermarried with Africans.

SIGNIFICANCE

Political stability did not accompany Oman's wealth and new territories. Although the Portuguese ceased to be any threat after 1730, new difficulties arose. Beginning with an invasion by the Persians during a succession dispute in 1737, Oman cycled between periods of trade-generated prosperity and bitter strife within its ruling class. Taking advantage of this situation, the Arab governor of Mombasa declared his independence in 1741 and established the Mazrui Dynasty, which ruled the Kenyan port city until it was reintegrated into Zanzibar in 1837. Also in 1741, Aḥmad ibn Saïd defeated the Persians and, returning to an earlier tradition, was elected imam in Oman. Upon his death, hereditary succession continued in the form of a new dynasty, the Busaidi, which has continued in power to the present. However, Arab power in the region had by then been supplanted by European empires.

Omani fortunes appeared to improve in 1820, when

Imam Saïd ibn Sulṭān, also known as Sayyid Saïd, expelled the Wahabis, rebuilt his navy, and strengthened his empire with British help. Under his guidance, the Swahili Coast's fertile lands were transformed. Around 1818, sailors returned from Indonesia with cloves, a hitherto unknown spice that thrived on East Africa's islands along with more than fifty other spices and fruit. Most Hadimu and many slaves from the mainland were forced to work on plantations, which eventually produced a third of the imam's revenues. Officially transferring his court to Stone Town, Saïd ignored troubled Oman and devoted his efforts to Zanzibar, from which Islamic and Arab influence spread. Furthering Oman's decline, many Arabs departed for better lives in Africa, where they built the palatial coral-stone homes with ornate carved doors and balconies that still characterize Zanzibar and the Swahili Coast.

—Randall Fegley

FURTHER READING

- Alpers, E. A. *Ivory and Slaves in East Central Africa to the Later Nineteenth Century*. London: Heinemann, 1975. A good account of Zanzibar and the east African slave trade.
- Hawley, Donald. *Oman and Its Renaissance*. London: Stacey International, 1984. This official reference on Oman includes much on the imams and Zanzibar.
- Moorehead, Alan. *The White Nile*. New York: Penguin, 1971. Moorehead's exciting account of European influence in east and northeast Africa begins with a chapter on Zanzibar during the late Omani period.
- Segal, Ronald. *Islam's Black Slaves: The Other Black Diaspora*. New York: Farrar, Straus and Giroux, 2001. An analysis of the thousand years of slave trading between Africa, India, and the Middle East, including much on Zanzibar.
- Strandes, Justus. *The Portuguese Period in East Africa*. Translated by Jean F. Wallwork. Edited by J. S. Kirkman. Nairobi, Kenya: East African Literature Bureau, 1961. Excellent source on Portugal's African empire.

SEE ALSO: June 10, 1749: Saïd Becomes Ruler of Oman; 1750: Treaty of Madrid; Dec., 1768-Jan. 10, 1773: Bruce Explores Ethiopia; 1775: Spanish-Algerine War; 1779-1803: Frontier Wars in South Africa.

RELATED ARTICLES in *Great Lives from History: The Eighteenth Century, 1701-1800*: James Bruce; Mentewab.

1701

PLUMIER PUBLISHES *L'ART DE TOURNER*

Charles Plumier's L'Art de tourner provided the basis for advances in manufacturing at the beginning of the eighteenth century. It cataloged every significant development in the history of lathes and prepared the way for further advances in the art of turning wood, that is, making objects from wood using a lathe.

LOCALE: Lyons, France**CATEGORIES:** Science and technology; art; manufacturing**KEY FIGURES**

Charles Plumier (1646-1704), French mathematician, biologist, and woodturner

Louis XIV (1638-1715), king of France, r. 1643-1715

Peter the Great (1672-1725), czar of Russia, r. 1682-1725

SUMMARY OF EVENT

Charles Plumier was born in Marseilles, a port in southern France, on April 20, 1646. Little is known of his parents or his childhood, other than that his father was a carpenter and woodturner. When he was sixteen, Plumier entered the Marseilles monastery of the Minims, an order founded by Saint Francis of Paola in 1469. The monks of this order, which had grown to more than four hundred cloisters, practiced extreme asceticism, abstaining from all meat and dairy products while engaging in arduous manual and intellectual work. Plumier dedicated himself to the study of the sciences, particularly physics and mathematics, showing such promise that soon after his arrival at the monastery he was sent to Toulouse to study under Father Emmanuel Maignan, a famous Minim mathematician and turner. Though the two skills seem unrelated today, mathematics lay at the heart of wood turning, both in the construction of the lathes and in the design and execution of the items to be turned.

Saint Francis of Paola had spent many years of his life in France during the reign of Charles VIII, who built two cloisters in France and one in Rome to be used only by French monks. For seven years (from 1643 to 1650), Emmanuel Maignan had been a resident at the Roman monastery, Trinita dei Monti, and had built a wood shop where he had practiced turning. It was there that Maignan sent his young student to further his education. Plumier was inspired by his teacher's accomplishments, and during his free time he used Maignan's tools to make the turnings for the choir stalls in the monastery's church.

Turning and mathematics did not consume all of Plumier's time; while in Rome, he studied botany with Paolo Boccone, an Italian botanist, and Philippe Sergeant and Pierre-Joseph Garidel, two botanists from Provence, the region surrounding Marseilles. Returning to France, he continued studying botany, becoming so well known in the field that he was chosen by Louis XIV to accompany the king's botanist, Joseph Donat Surian, to the French Antilles in 1689. On his return, Plumier wrote his first book, *Description des plantes de l'Amérique* (1693; description of the plants of America). The volume impressed Louis XIV sufficiently that he appointed Plumier royal botanist and sent him back to the Antilles two more times, in 1693 and 1695, to continue cataloging the native flora and evaluating the economic and medicinal properties they might have. By the time of his death, Plumier had published fifteen volumes of plants illustrated with six thousand drawings.

Though Plumier continued to work on the data he had acquired in America, publishing *Nova plantarum americanarum genera* (1703-1704; new genera of American plants) and *Traité des fougères de l'Amérique* (1705; treatise on the ferns of America), increasingly his attention focused on his old hobby of turning. In 1689, the year Plumier first was sent to the New World, France's most celebrated turner, Nicolas Grollier de Servière, had died. His work—both the lathes that he used and the intricate objects that he produced—had attracted national attention; King Louis XIV had visited his shop and marveled at what he saw. After Grollier's death, his son kept the shop intact. Plumier, visiting this shrine to machine precision, was inspired to write a treatise on the state of lathes and turning. He illustrated his book with some of Grollier's art pieces made on the lathe.

Approaching his project with the precision and order of his botanical studies, between 1695 and 1701 Plumier began visiting turners all over Europe, making detailed drawings of every type of lathe he saw. In France, he met M. de Maubois, who was the turner for the king in the Louvre. He studied art pieces made by Faucher Poitevin, like himself born in Marseilles, who was the most celebrated turner at the time. When not searching out contemporary turners, he researched the history of the craft, tracing it back to its mythical origins under the reign of King Solomon.

The culmination of Plumier's research was his treatise *L'Art de tourner* (1701; the art of turning). The text

detailed the progress made from antiquity to modern times, describing, explaining, and diagramming every type of lathe. Plumier's book made its way to Russia, where Peter the Great, himself an accomplished turner, had it translated into Russian. It became the standard source in Europe for information on the technical basis for turning as the eighteenth century began its accelerating march into industrial production.

Charles Plumier did not live to see his work gain the wide popularity that it ultimately enjoyed. Pleurisy caused his untimely death in 1704 in Santa Maria, near Cadiz, Spain, where he was preparing for his fourth expedition to America.

SIGNIFICANCE

Charles Plumier was both a scientist and an artisan, whose life illustrated the integration of those endeavors that laid the foundation for the intellectual and industrial revolutions of the eighteenth century's Enlightenment. For him, as for many of his peers, there was no natural boundary between mathematics and its application in turning, no difference in the precise order of numbers and the systematic categorization of the plant world, no difference in the rigorous methodologies that allowed him to see the range of plants that inhabited the Antilles and to comprehend the variety of lathes in use in Europe. His great skill was to assemble the bodies of information that would allow his readers, both in biology and in turning, to see what was known and to use that knowledge as the basis for building a better future. He was a part of the great intellectual excitement of the seventeenth century that provided the systematic

foundation for the spectacular advances of the century to follow.

—Denyse Lemaire and David Kasserman

FURTHER READING

Bunch, Brian, and Alexander Hellemans. *The History of Science and Technology: A Browser's Guide to the Great Discoveries, Inventions, and the People Who Made Them from the Dawn of Time to Today*. Boston: Houghton Mifflin, 2004. Provides a wealth of information on the history of science, technology, and invention. Readers will appreciate the clarity of the text.

Gribbin, John. *The Scientists: A History of Science Told Through the Lives of Its Greatest Inventors*. New York: Random House, 2004. This book is easy to read and describes the evolution of science in the last five hundred years.

Porter, Roy. *Eighteenth-Century Science*. Vol. 4 in *The Cambridge History of Science*. New York: Cambridge University Press, 2003. Offers a comprehensive survey of the revolution of the sciences during the Enlightenment.

SEE ALSO: 1701: Tull Invents the Seed Drill; 1733: Kay Invents the Flying Shuttle; 1759: Wedgwood Finds a Ceramics Firm; 1764: Invention of the Spinning Jenny; 1779: Crompton Invents the Spinning Mule; Feb. 14, 1788: Meikle Demonstrates His Drum Thresher; 1793: Whitney Invents the Cotton Gin; 1795: Invention of the Flax Spinner.

RELATED ARTICLE in *Great Lives from History: The Eighteenth Century, 1701-1800*: Peter the Great.

1701

TULL INVENTS THE SEED DRILL

Jethro Tull's invention of the seed drill revolutionized farming. The drill replaced the wasteful and labor-intensive broadcast method of seeding and paved the way for subsequent advances in mechanized agricultural machinery.

LOCALE: Howberry, Crowmarsh (near Wallingford), Oxfordshire, England

CATEGORIES: Inventions; agriculture; science and technology

KEY FIGURES

Jethro Tull (1674-1741), English agriculturalist and inventor

John Worlidge (fl. 1669-1698), early designer of a seed drill and the probable source of some of Tull's ideas

Gabriel Plattes (1600-1655), early patent holder for a seed drill that was never made

Taddeo Cavalini (fl. late sixteenth century), early Italian inventor of a seed drill that closely resembled Tull's

Henri-Louis Duhamel du Monceau (1700-1782), French agriculturalist, tree expert, and chemist

John Mills (d. 1784?), Englishman living in France who translated Monceau's work into English

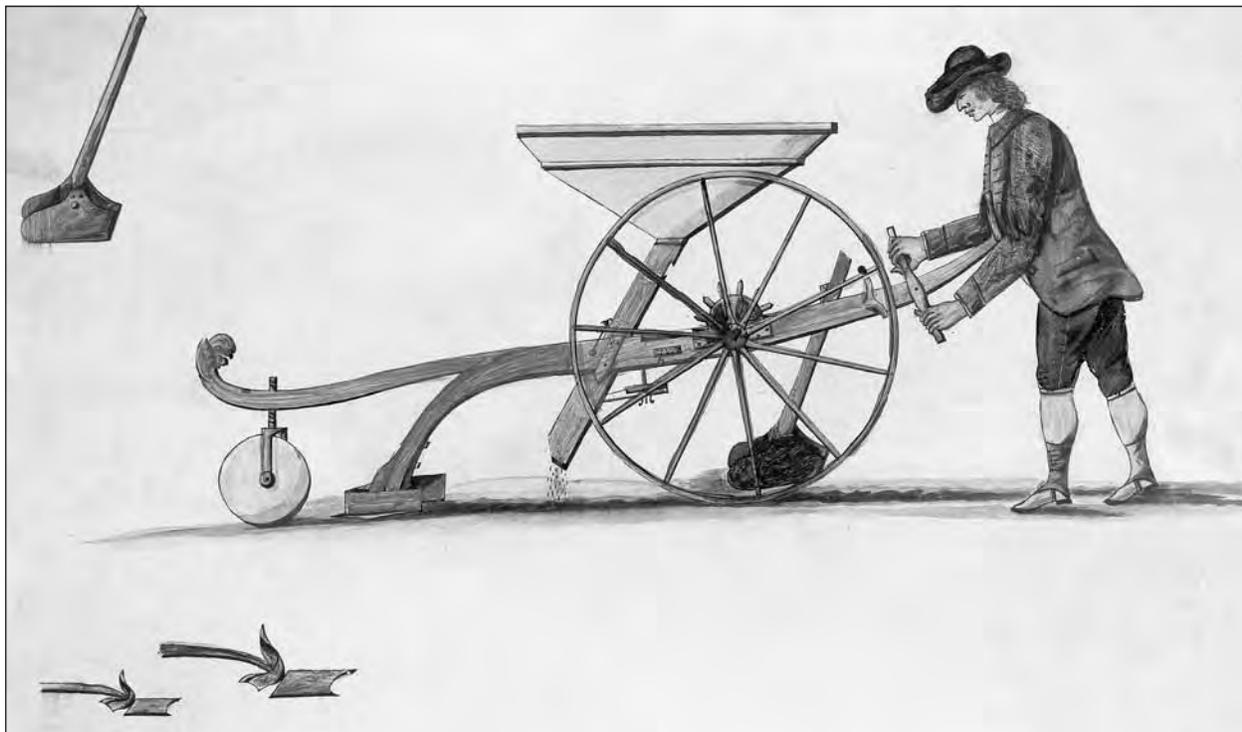
SUMMARY OF EVENT

Seeding methods in early eighteenth century England were essentially those that had been practiced for thousands of years. Broadcasting was widespread. Workers walked over a field, casting seed in sweeping motions as they went. As a result, even with skilled broadcasters, a great deal of grain was wasted, and some parts of the field were sparsely covered while others were overseeded. While broadcasting could be used somewhat effectively with grains, the method was not appropriate for vegetables, which had to be planted in rows. Primitive seed-dropping devices were used with vegetables. Hand-dibbing was also used: One worker walked ahead, using a tube with punches in it to make holes in the ground; another walked behind, depositing the seed in the holes and covering the seed with earth. A later improvement involved a tube attached to a primitive plow, but the flow of seeds still could not be regulated. In the sixteenth century, a setting board was used that allowed seeds to be dispersed three inches deep in the soil and at intervals of three inches.

Although Jethro Tull is acknowledged as the inventor of the seed drill, his was not the first seed drill to be designed. Taddeo Cavalini designed a seed drill in the late

sixteenth century that he claimed would use only half the grain and still yield one-third more crop than if broadcasting were used, but there is no evidence that such a machine was ever made. Other inventors, most not farmers themselves, also designed seed drills. Alexander Hamilton, Daniel Ramsay, and Gabriel Plattes obtained patents for their seed drills, but only Plattes left a record of what the machine would have looked like. Later, John Worlidge designed a seed drill, but it was not actually made and used until much later. In fact, though Tull initially claimed that his invention was not dependent on any earlier accounts of seed drills, he later acknowledged that he had seen drafts of John Worlidge's drill. Tull, however, was the first person to construct a seed drill that worked.

A country gentleman of means, Tull was Oxford educated and later was admitted to the bar in 1699, but instead of practicing law, he left London for his father's farm at Howberry, Crowmarsh, where he conducted his agricultural experiments. He was one of several agronomists who worked on what was then called the Norfolk System. Tull did not like the wasteful broadcasting method of sowing seeds, but his workers were tied to the traditional broadcasting technique. Tull wanted his workers to make channels, sow smaller quantities of seed, and



Jethro Tull's seed drill. (Hulton Archive/Getty Images)

then cover the seeds with soil. In his absence, his workers turned to broadcasting, so around 1701, Tull designed and made his seed drill.

The drill, which was later described and illustrated in his *The New Horse Houghing Husbandry: Or, An Essay on the Principles of Tillage and Vegetation* (1731), was horse drawn and consisted of three narrow hoes, which allowed for the seeding of three rows at a time. The hoes had passages behind them that guided the seed from the funnels above to the channels in the ground. The hoes, the framework supporting them, and the shafts resting on the ground were carried by the four wheels of the machine. The large front wheels carried the seed box and the dropper unit that fed the center hoe, and the two smaller rear wheels carried the droppers and seed boxes feeding the other two hoes. The dropper unit consisted of the case at the bottom of the seed box and the notched axle that passed through it. The axle with notches and cavities turned the wheels, took on the grain from the boxes above, and dropped it into the funnels that went behind the hoes. The passage of grain past the notched dropper had a brass cover and an adjustable spring similar to the tongue in an organ. (Tull had earlier taken apart an organ and noticed its rotating cylinder.)

Tull's machine initially had limited success. Tull did succeed in growing wheat on the same field for thirteen successive years without having to let the field lie fallow (that is, allow the field to "rest" between crops to build up depleted soil nutrients). He never had the chance to use the seed drill for the planting of sainfoin, a kind of legume that was Tull's favorite crop. Tull's seed drill was not widely adopted after he demonstrated its viability. The drill had its detractors, and there was considerable controversy about its usefulness.

In 1709, as a result of some pulmonary problems (he was often sick), Tull toured Europe, hoping to recover his health. He observed seeding practices, particularly in France and Germany, and incorporated European approaches into his own thinking. In 1731, his *The New Horse Houghing Husbandry* helped spread his ideas.

Also in 1709, Tull moved from Crowmarsh to Prosperous Farm, at Hungerford, Berkshire, where he continued to work on agricultural machines. In addition to the seed drill, he invented a horse hoe and a four-hoed plough. His was a holistic approach to farming, but few farmers actually adopted all of his ideas, particularly his belief that hoeing the soil made the use of manure unnecessary.

After his death in 1741, the controversy over Tull's ideas abated, but following Henri-Louis Duhamel du

Monceau's *Traité de la culture des terres suivant les principes de M. Tull anglais* (1753-1761; *A Practical Treatise of Husbandry*, 1759, 1762), a six-volume "extract" of Tull's ideas, and John Mills's translation of the French book into English, the debate renewed. Despite some critics, this time Tull's ideas, perhaps because of Monceau's book, carried the day. There were, however, still some farmers and many field hands who clung tenaciously to the past and who were suspicious of "new" ideas. Tull had argued that his drill and his agricultural methods were financially advantageous, but he did not have the financial accounts to support his claims. Ultimately, the battle was won on the agricultural fields.

SIGNIFICANCE

Scholars specializing in agricultural machinery claim that all subsequent seeding machines were derivative copies or were heavily influenced by Jethro Tull's designs. His theories were widely promulgated, especially in France, where his works were translated by Monceau. Despite the fact that his seed drill worked, it was not until the nineteenth century that it was manufactured on a large scale. His methods were even more effective after 1830, when the subsoil plow broke up deeper levels of the soil, aerating it, and by 1866 a modification of his seed drill was a common implement on every farm in England. According to G. E. Fussell, a leading historian of farm machinery, Jethro Tull's first seed drill with its internal moving parts was the precursor of complex twentieth century agricultural machines. Though some of his theories are still debated, his invention of the seed drill remains one of the most important agricultural advances of all time.

—Thomas L. Erskine

FURTHER READING

Bourde, André. *The Influence of England on the French Agronomes*. Cambridge, England: Cambridge University Press, 1953. Duhamel du Monceau modified Tull's theories about farming and translated them into French. Bourde demonstrates how thoroughly Tull influenced French agriculture.

Fussell, G. E. *The Farmer's Tools: A History of British Farm Implements, Tools, and Machinery Before the Tractor Came, from A.D. 1500-1900*. London: Andrew Melrose, 1952. Discusses the predecessors of Tull's seed drill and provides helpful illustrations.

_____. *Jethro Tull: His Influence on Mechanized Agriculture*. Reading, Berkshire, England: Osprey, 1973. Thorough coverage of Tull's life, his inventions and those of his predecessors, and his standing among agricultural giants.

SEE ALSO: 1705-1712: Newcomen Develops the Steam Engine; Jan. 7, 1714: Mill Patents the Typewriter; 1733: Kay Invents the Flying Shuttle; 1747: Marggraf Extracts Sugar from Beets; 1760's: Beginning of Selective Livestock Breeding; 1764: Invention of the Spinning Jenny; 1765-1769: Watt Develops a More Effective Steam Engine; 1767-1771: Invention of the Water Frame; 1779: Crompton Invents the Spinning

Mule; Feb. 14, 1788: Meikle Demonstrates His Drum Thresher; 1790: First Steam Rolling Mill; 1793: Whitney Invents the Cotton Gin; 1795: Invention of the Flax Spinner.

RELATED ARTICLES in *Great Lives from History: The Eighteenth Century, 1701-1800*: Alexander Hamilton; Jethro Tull.

c. 1701-1721

GREAT NORTHERN WAR

The Great Northern War established Russia as the dominant power in the Baltic region and led to Sweden's decline as a great military power in Europe.

ALSO KNOWN AS: Second Northern War

LOCALE: Central and northeastern Europe

CATEGORIES: Wars, uprisings, and civil unrest; expansion and land acquisition

KEY FIGURES

Peter the Great (1672-1725), emperor of Russia, r. 1682-1725

Charles XII (1682-1718) king of Sweden, r. 1697-1718

Augustus II (1670-1733), elector of Saxony, r. 1697-1733, and king of Poland, r. 1697-1704, 1709-1733

Frederick IV (1671-1730), king of Denmark, r. 1699-1730

Johann Reinhold von Patkul (1660-1707), Livonian noble

Stanisław I (1677-1766), king of Poland, r. 1704-1709, 1733-1736

Adam Ludvig Lewenhaupt (1659-1719), Swedish general

Aleksandr Danilovich Menshikov (1673-1729), Russian military commander

Georg Heinrich von Görtz (1668-1719), German politician serving Charles XII

Ivan Stepanovich Mazepa (1639-1709), Cossack military leader

SUMMARY OF EVENT

The Great Northern War—during most of which Russia, Saxony-Poland, and Denmark allied against Sweden—was fought primarily in Saxony, Poland, the Baltic regions, and Russia. It was essentially the continuation of an earlier, inconclusive struggle between Sweden and Russia for control of the eastern Baltic region. This time,

however, the struggle was decisive, and Russia emerged victorious to become the dominant power in the Baltic, while Sweden's Charles XII was defeated.

During the early part of the war, the great powers of Western Europe were occupied with their own conflict, the War of the Spanish Succession. After 1713, when that war was in its final stages, Britain and Hanover noticed Russia's aggression, and they attempted to limit Russia's domination of the Baltic Sea. Prussia, meanwhile, took advantage of Sweden's plight and captured Swedish Pomerania. The Ottoman Turks became involved in the conflict as well, granting Charles XII asylum after his defeat at the Battle of Poltava.

In 1699, Czar Peter the Great of Russia had joined Denmark and Saxony-Poland in a secret coalition against Sweden. All three powers had territorial ambitions: King Frederick IV of Denmark wanted Holstein-Gottorp; the ruler of Saxony-Poland, Augustus II, had his eyes on Livonia and Lithuania; and Peter himself dreamed of expanding Russia to the Baltic coast. The idea of this anti-Swedish coalition may have originated with the Livonian nobleman Johann Reinhold von Patkul.

Between January and August, 1700, Saxony-Poland, Denmark, and Russia declared war on Sweden. However, Charles XII, who had come to the Swedish throne at the age of fifteen, was an effective military leader. He quickly defeated Frederick IV, who was forced to sign the Treaty of Travendal on August 8, 1700. The Swedish king then moved against Augustus II, defeating him in Poland. He effectively deposed Augustus as Polish king and replaced him with Stanisław I Leszczyński. Then he defeated Augustus in Saxony as well and forced him formally to renounce the Polish throne in the Treaty of Altranstädt in September, 1706. Patkul was turned over to the Swedes, who executed him. In the wake of these

defeats, Russia found itself fighting Sweden alone for three years. Not until after the Battle of Poltava in 1709 did Denmark and Saxony-Poland re-join the Russians in the war against Sweden.

Charles XII moved against Russia soon after Peter the Great declared war on Sweden in August, 1700. The Swedish king defeated a Russian force that was besieging the Baltic seaport of Narva on November 30, 1700. After the Siege of Narva was broken, Charles XII thought that Russia was no longer a threat, and over the next six years he turned his attention to the defeat of Augustus II. This decision allowed Peter the Great to reorganize his military, build a Baltic navy, and seize Swedish towns in the Baltic region. In the autumn of 1702, he captured Nöteborg, on the mouth of the Neva River, and renamed it Schlüsselburg (“key fortress”). In early 1703, Peter started the construction of St. Petersburg, the future capital of Russia, near Schlüsselburg. While the Swedish king was occupied in Poland and Saxony, Russia was also able to overrun Dorpat and Narva (1705) and Courland (1705-1706).

After the defeat of Saxony in late 1706, Charles XII again turned his attention to Russia and devoted the following year to building up his army for an invasion of that country. Peter the Great had supported Poland’s nobles in their struggle against Charles by giving them massive subsidies. He also supported anti-Swedish resistance by Lithuanian nobles. He knew that Sweden would eventually invade Russia. In anticipation of the Swedish invasion, Peter withdrew his forces from the Baltic areas he had captured (except St. Petersburg). He engaged in a scorched-earth policy, devastating border regions that might provision Charles XII’s army. He also fortified the Kremlin in Moscow.

In January, 1708, the Swedish king crossed Berezina and moved toward Mogilev on his way to Moscow. By

TREATY OF NYSTAD, 1721



1700's

July, Charles had defeated the Russians at Holovzin and reached Mogilev. However, lack of supplies, poor roads, and resistance by the Russians made it difficult to advance any farther into Russian territory. In September, 1708, the Swedish king decided not to take Moscow and instead to invade the more accessible Ukraine in order to solve his supply problems.

Charles expected to obtain additional men and supplies from another Swedish army under the command of general Adam Ludwig Lewenhaupt, but Lewenhaupt was defeated by Peter and his general, Aleksandr Danilo-



The Swedish army carrying the body of Charles XII after the Battle of Frederikshald. (R. S. Peale and J. A. Hill)

vich Menshikov, at the Battle of Lesnaya on September 28, 1708. Although Lewenhaupt did join Charles, he had lost his supplies and much of his artillery, and the aid that Charles expected from Ivan Stepanovich Mazepa, the Cossack leader of the western Ukraine, failed to materialize, because Menshikov attacked Mazepa, who escaped with only two thousand Cossacks to support Charles's cause. At the Battle of Poltava on July 8, 1709, Peter and Menshikov decisively defeated Charles, who was forced to seek asylum with the Turks. His presence in the Ottoman Empire led to a Russian-Turkish war in December, 1710. This war against the Ottomans proved disastrous for Peter, who was defeated at the Battle of the Pruth River in 1711, resulting in the loss of Azov.

Charles XII left the Ottoman Empire under the pseudonym Captain Peter Frisk and arrived in Stralsund on November 11, 1714. Charles arrived in Sweden in early 1715 to find new enemy coalitions arrayed against him, coalitions including Prussia and Hanover. A plan organized by Baron Georg Heinrich von Görtz and accepted by Peter in 1713 called for Prussia to support the duke of Holstein's claim to the Swedish throne. In return, Prussia would be allowed to keep Swedish Pomerania. Charles

XII did not see the end of the war: He was killed in battle in December, 1718, at Frederikshald, Norway. With Charles dead, Peter's armies and his Baltic fleet could move at will against Swedish positions in the eastern Baltic region, including Finland and the Swedish coast. In February, 1720, Sweden signed peace treaties with Hanover and Prussia at Stockholm, and in June, 1720, Denmark and Sweden agreed to the Treaty of Frederiksborg. Hanover obtained Bremen and Verden, Prussia gained Stettin and portions of Pomerania, and Denmark obtained part of Schleswig. Russia and Sweden agreed to the Treaty of Nystad on September 11, 1721, which awarded Estonia, Livonia, Ingria, and Karelia to Russia.

SIGNIFICANCE

The Great Northern War ended Sweden's role as a great European power. It lost its hold on its northeastern German and Baltic territories to Prussia and Russia. Prussia gained much of Swedish Pomerania, paving the way for its massive eastern territorial expansion during the second half of the eighteenth century and its rise to German dominance in the nineteenth century. Meanwhile, as the leading power in Eastern Europe, Russia became much

more involved in European affairs, playing a decisive role in major European conflicts in the eighteenth, nineteenth, and twentieth centuries. Russia also gained direct influence over Poland and, because Peter maintained a policy of Russian dynastic intermarriages with nobles in Courland, Wolfenbüttel, Mecklenburg, and Holstein, the country faced future entanglements in German affairs and wars.

Symbolic of Russia's rise as a great European power and its victory over Sweden, Peter in 1721 assumed the title of czar (emperor). There was apprehension among some leading European philosophers and officials of Russia's rise as a great power. The German philosopher Gottfried Wilhelm Leibniz (1646-1716) reacted to the Russian victory at Poltava by suggesting that Peter the Great would become the new "Turk of the North."

—Johnpeter Horst Grill

FURTHER READING

- Anderson, M. S. *Peter the Great: Profiles in Power*. 2d ed. New York: Longman, 1995. Detailed and balanced short summary of the war in chapter 4.
- Bain, Robert Nisbet. *Charles XII and the Collapse of the Swedish Empire, 1682-1719*. Freeport, N.Y.: Books for Libraries Press, 1964. Originally published in 1895, it is still useful for an evaluation of Charles XII as a military leader.
- Chance, J. F. *George I and the Northern War*. London: Smith, Elder, 1909. A still-useful work on the diplomatic history of the conflict during its later stages.
- Englund, Peter. *The Battle That Shook Europe: Poltava and the Birth of the Russian Empire*. New York: I. B. Tauris, 2003. Excellent use of memoirs and diaries of participants, with special emphasis on the Swedish experience.
- Frost, Robert I. *The Northern Wars: War, State, and Society in Northeastern Europe, 1558-1721*. New York: Longman, 2000. The only scholarly study of the long-term conflict in the Baltic region available in English.
- Hatton, R. M. *Charles XII of Sweden*. New York: Weybright and Talley, 1968. Essential for understanding the motives and policies of the Swedish king.
- Hughes, Lindsey. *Russia in the Age of Peter the Great*. New Haven, Conn.: Yale University Press, 1998. Chapter 2 offers a solid, recent scholarly review of all of Peter's wars between 1696 and 1725.
- Rothstein, A. *Peter the Great and Marlborough: Politics and Diplomacy in Converging Wars*. New York: St. Martin's Press, 1986. Valuable for Russian diplomatic relations with Britain during the early stages of the conflict.
- Sumner, B. H. *Peter the Great and the Emergence of Russia*. New York: Collier, 1962. The last chapter provides a general evaluation of Peter's legacy on Russian foreign policy after the Treaty of Nystadt.
- Wolf, John B. *The Emergence of the Great Powers, 1685-1715*. New York: Harper and Row, 1962. Includes an interesting chapter evaluating the relationship between the Great Northern War and the War of the Spanish Succession.

SEE ALSO: May 27, 1703: Founding of St. Petersburg; June 27, 1709: Battle of Poltava; Nov. 20, 1710-July 21, 1718: Ottoman Wars with Russia, Venice, and Austria; Oct. 21, 1727: Treaty of Kiakhhta.

RELATED ARTICLES in *Great Lives from History: The Eighteenth Century, 1701-1800*: Charles XII; Peter the Great.