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Plyometric Exercises for Enhanced Athletic Performance Plyometric training can help improve power, speed, agility, and overall athletic performance by enhancing neuromuscular efficiency. However, it's crucial to understand its benefits and challenges before incorporating it into your routine. Plyometrics can aid in improving muscle coordination and efficiency. To get the most out of plyometric exercises, start with basic movements like squat jumps, depth jumps, box jumps, lateral box jumps, tuck jumps, skater jumps, and burpees. Plyometric training is essential for runners to improve their power, speed, and agility. However, it's crucial to consult with a healthcare professional to determine if plyometrics are safe for you, considering any age limitations and health considerations. Plyometric exercises focus on explosive movements using body weight or minimal equipment, which differs from Olympic weightlifting and powerlifting. The benefits include improved power, speed, and agility, making it suitable for both athletes and non-athletes. Some useful links are provided, including trail running, ultramarathon, exercise science, and more. Expert advice is offered by an experienced coach and ultrarunner, designed for beginners to 100 milers and beyond. palyometric exercises can be an effective way for trail runners to improve their explosive power and speed. The warm-up portion of the workout should include approximately 5-10 minutes of low-intensity aerobic exercise, followed by specific drills that mimic the movements of plyometric exercises. Examples of these drills include marching, toe-jogging, straight-leg jogging, butt kickers, exaggerated skips, lateral shuffles, and forward, side, and back lunges. The goal of plyometric exercises is to build explosive power and speed, so it's essential to perform 2-6 sets of 3-8 powerful reps. For lower body plyometrics, the number of foot contacts per workout is often used as a measure of volume. According to the National Strength and Conditioning Association, beginners should aim for 80-100 contacts per workout session, while intermediate athletes should target 100-120 contacts. Due to the high-intensity nature of plyometric exercises, sufficient recovery time is necessary between sets. The recommended work-to-rest ratio is 1:5 to 1:10, meaning if it takes 10 seconds to complete an exercise like squat jumps, you should rest for 50-100 seconds before starting the next set. It's also essential to allow for adequate recovery time between plyometric workouts, with a minimum of two days' rest recommended. Additionally, the National Strength and Conditioning Association advises against performing plyometric exercises on consecutive days for the same body area. Jumping rope is a high-intensity exercise that's great for getting your heart rate up and improving coordination. To do it, start with your feet together, then explosively jump into the air, swinging your arms behind your body. As you land, absorb the impact by bending your knees and allowing your body to sink slightly. Immediately repeat the jump, keeping your arms swinging behind you. Next, try a plyometric bound. Start by jogging at a comfortable pace, then push off one foot and bring the opposite leg forward in an exaggerated movement, reaching out with your arm. Land on the front foot and immediately repeat on the other side. This exercise helps improve power and speed. The depth jump is another great plyometric exercise. Start by standing on one foot, then explosively jump up and forward, using both arms to assist. Land in the starting position and immediately repeat the hop using the same leg. This exercise helps improve power and athleticism. The single-leg hop is a more advanced plyometric exercise that targets the legs and core. Start by balancing comfortably on one foot, then use a countermovement slight squat to explosively jump upward as high as possible. Use your arms to reach for something above you, then land in the starting position on one leg, with a slight bend in the knee. The lateral bound is another plyometric exercise that targets the legs and core. Start by taking a big lateral jump to one side, bending your supporting knee and tucking the opposite leg behind it. Then, immediately explode back into a lateral jump in the other direction, using your arms for balance and momentum. Finally, try some equipment-based plyometrics exercises like box jumps or weighted ball throws. These exercises can help improve power and strength while minimizing the risk of injury. Remember to take 24 hours between plyometric workouts to allow your muscles time to recover. With consistent practice, you can improve your coordination, speed, and overall athleticism. Plyometric exercises are a type of high-intensity workout that requires recovery time between sessions. The fast-twitch muscle fibers used in plyometrics need at least 24 hours to recover and strengthen the connective tissue, which is essential for injury prevention. Overdoing it with plyometric workouts can lead to injuries such as knee and ankle sprains, hamstring strains, stress fractures, and wrist injuries. #### Why Plyometrics Should Not Be Done Every Day Plyometric exercises are not suitable for daily workouts due to their high intensity and the need for recovery time between sessions. The connective tissue needs at least 24 hours to heal and strengthen, making it essential to space out plyometric workouts. #### Benefits of Plyometric Training Despite its intensity, plyometric training can be an effective way to improve coordination, strength, endurance levels, and bone health. It can also help with fat burning by increasing muscle mass and calorie expenditure after exercise is finished. Plyometrics is one of the most unique training methods that usually focuses on explosive jumping exercises to enhance power, speed, and agility. Determining the best time to include plyometrics in your workout can be the key to achieving results or not. For beginners, this can be confusing, especially with limited information. You might wonder whether to do plyometrics before, after, or during your workout. A common question I get is: when is the best time to perform plyometrics? While the timing rarely affects results, experts suggest doing them before weight training and after warming up, as it involves intense exercises requiring full body strength. This article will explore the best time for plyometrics and the reasoning behind it. To answer this, we'll examine the effects of performing plyometrics before, during, and after workouts to determine which timing yields the best outcomes. Plyometrics are high-intensity movements involving quick, powerful jumps. It's one of the most intense training methods, so it strains the body and muscles, requiring them to be at peak capacity. Doing plyometrics before weight training and after warming up (to prevent injury) ensures your body can handle the workload. Imagine a fully charged phone; even with heavy usage, it performs well based on battery levels. Similarly, warming up prepares your body for the intensity of plyometrics. This is why experts recommend doing plyometrics during this phase when your body is ready for power. Performing plyometrics mid-workout can also be effective, especially if your routine is slow-paced. It surprises your muscles, creating a sudden intensity shift from normal weight training. This forces your muscles to adapt by growing to avoid injury. For example, transitioning from regular squats to explosive box jumps creates a significant momentum change, boosting strength. Surprising your body accelerates results and adds variety to weight training, which can become monotonous. Some prefer doing plyometrics at the end of their workouts if their body can handle the intensity. Ending with a "bang" increases calorie burn, aiding weight loss. However, most find it difficult and risky for beginners. If you can handle it, it's an option, but it's not recommended. Beginners should start plyometrics after warming up and before weight training, as their bodies are less prepared for intense exercises later. Gradually increase intensity as your body adapts. The best time depends on personal preference. Some prefer intense workouts at the end, while others start with plyometrics. Experiment to find what suits you. Stop debating whether to do plyometrics before or after lifting. Research shows plyometrics before lifting leads to greater performance gains. However, this isn't the full story. As you advance, you might integrate plyometrics during lifting sessions. Always do plyometrics before or during a lifting session. Let's discuss doing plyometrics before lifting first. My general rule is fast to slow: start with fast movements and progress to slower ones. For example: A1) Drop Jump B1) Power Clean C1) Back Squat Perform fast movements when fresh to maximize speed and power. Doing plyometrics at the end of a session leaves you fatigued, reducing intensity. A study on high-school soccer players [1] illustrates this. Plyometric exercises before soccer training sessions yield better results than performing them afterwards, and incorporating plyos within a session using supersetting can lead to improved performance outcomes. This method involves pairing heavy strength exercises with speed or plyometric exercises to enhance force generation capabilities and promote long-term gains. For advanced trainees, the complex method can be employed by supersetting plyometric exercises with heavy resistance training. For example, combining back squats with hurdle hops can potentiate the plyometric exercise, leading to improved performance. However, rest times vary significantly based on the intensity of the preceding exercise and individual strength levels. If time is limited, shorter rest periods can be used, but longer rest times are generally recommended for optimal recovery. The choice of training days depends on the training split, with some athletes opting for a high-low split or upper-lower split. A high day typically includes plyometric exercises, while a low day focuses on hypertrophy and size. The upper/lower split is an effective way to organize training when focusing on muscle growth, with lower body days featuring plyometrics and upper days prioritizing strength and size. Conversely, performing plyometrics during leg days can be counterproductive if the goal is muscle growth rather than performance. To maximize speed and power development, plyometric exercises should be performed before or during lifting. Post-lifting, plyometrics can dampen the effect, leading to poor physical outputs. When introducing a new plyometric routine, it's essential to start slowly and gradually increase intensity to prevent injury. Plyometrics offer numerous benefits for athletic performance and injury prevention. A well-structured plyometric program can help improve jump height, speed, and endurance, while also reducing the risk of injury. The key to unlocking these benefits lies in understanding how plyometrics affect muscle and tendon architecture. Plyometric training is crucial for optimizing force production during high-intensity activities like jumping and sprinting. By increasing neural adaptations such as firing rate, synchronization, and excitability of motor units, plyometrics provide more horsepower to muscle fibers, enhancing overall performance. The length-feedback component in plyometrics emphasizes the importance of muscle spindles sensitive to stretch rates. This mechanism can be promoted through plyometric training, allowing for increased force production without excessive energy expenditure. However, there is also a need for inhibition mechanisms, such as the Golgi Tendon Organ (GTO), which prevents excessive force generation and reduces the risk of injury. Plyometric training has been shown to inhibit this mechanism in individuals who have undergone heavy strength training, resulting in improved performance with less risk. Jumping tasks exhibit significant improvements in performance following plyometric training. Even simple drop jumps have a noticeable effect on jump height, while more complex tasks like countermovement and vertical jumps show even greater gains. The benefits of plyometric training are evident across various sports disciplines, including volleyball and running. Individuals with limited training experience see the most pronounced advantages in terms of jump performance. However, running economy is another key factor that can be improved through plyometric training. When combined with resistance training, it enhances overall performance. Some studies have reported a modest reduction in sprint times following plyometric training, while others found no significant improvements. The discrepancy might be attributed to the type of plyometric exercises used and whether they were vertically or horizontally oriented. The muscle slack theory offers an insightful explanation for how plyometrics can improve performance. By increasing muscular tension through pre-tensioning, individuals can generate more force during explosive movements like jumping off a box. While there are no significant drawbacks to plyometric training, there is a need to be mindful of potential risks such as knee or ankle injuries. However, with proper training and precautions, individuals can safely integrate plyometrics into their workout routine. plyometrics provide an intense plyometric stimulus to your falling body, requiring minimal knee bend and rapid rebound into the air. This exercise necessitates adequate muscular pre-tension to successfully execute the movement. The depth jump differs from drop jumping by incorporating longer ground contact times and increased knee bends. Utilizing higher boxes is also a distinct characteristic of this technique, which stems from Verkhoshanksy's shock method. Stepping off a tall box and rebounding as high as possible produces an intense experience that can be observed in videos, often resulting in the average person's knees exploding due to the sudden impact. The hurdle hop emphasizes rhythm, much like multiple drop jumps performed continuously, allowing for efficient switching between muscles during movement. Fast-paced athletes tend not to generate significant force but can relax at higher rates. Hurdle hop variations abound, including double bounces and hurdles of varying heights, all aimed at manipulating the rhythm. Bounding is a staple in sprinters, involving single-leg plyometric exercises where you propel yourself forward while placing immense stress on your ankles and Achilles tendon. A gradual approach to this exercise is essential due to its intense nature. Plyometrics yield numerous physical adaptations and performance improvements. However, they are not required for those training solely for physique goals. On the other hand, participating in sports emphasizing speed and power necessitates integrating plyometric exercises into one's regimen. Extensive research highlights the benefits of plyometric training, including muscle architecture adaptations and improved tendon stiffness. References to studies such as Brughelli et al., Ramirez-delaCruz et al., Earp et al., Franchi et al., Ullrich et al., Monti et al., Blazevich et al., Kalkhoven et al., De Villarreal et al., Sole et al., Ramirez-Campillo et al., Balsalobre-Fernández et al., Eihara et al., Denadai et al., and Coratella et al. demonstrate the profound effects of plyometric training on physical fitness. Plyometrics and Isometrics: How to Combine Them for Enhanced Performance The effectiveness of combining plyometrics and isometrics in athletic training has been a topic of debate. While there is no one-size-fits-all answer, research suggests that contrast training, which involves alternating between these two exercises, can enhance performance. Understanding the role of each exercise and how to combine them is crucial for optimizing training programs. Plyometric Training ---------- Plyometric training, also known as jump training, involves rapid, high-intensity movements that improve power output. This type of training can be beneficial for athletes who require explosive strength, such as sprinters or jumpers. Plyometrics work by recruiting fast-twitch muscle fibers, which are responsible for generating force quickly. Isometric Training ---------- Isometric training, on the other hand, involves contracting muscles without moving the joints. This type of training targets tendon stiffness and can improve rate of force development (RFD), a key factor in sports performance. Isometrics work by strengthening the muscles and tendons, which can help to prevent injuries. When to Do Plyometrics and Isometrics ---------- There is no definitive answer to whether plyometrics should be done before or after isometrics. Some experts recommend doing plyometrics first, followed by isometrics, while others suggest starting with isometrics to activate the muscles and prime them for plyometric activity. Research suggests that it may be beneficial to do both exercises on the same day, as this can allow for optimal recovery and training stimulus. However, if an athlete is feeling particularly sore after a plyometric workout, it may be necessary to give their muscles a day or two to rest before doing isometric training. Combining Plyometrics and Isometrics ---------- One effective way to combine plyometrics and isometrics is through contrast training. This involves performing an isometric contraction before a plyometric exercise to take advantage of the post-activation potentiation (PAP) effect. The PAP effect refers to the temporary enhancement of muscle performance that occurs after an initial contraction. For example, an athlete could perform an isometric squat followed by a countermovement jump. This combination would work the quadriceps muscles in both an isometric and plyometric manner, potentially leading to improved performance. Plyometric-isometric training combines the benefits of explosive power and strength gains, allowing athletes to optimize their performance in sports that require quick changes in direction or explosive movements. This type of training utilizes the stretch-shortening cycle of muscle contractions, which involves a rapid eccentric phase followed by an explosive concentric phase. ###ARTICLEPlyometric Training: A Structured Approach for High-Intensity Explosive Movements Advanced athletes with strong strength and conditioning backgrounds may be able to handle higher frequency plyometrics due to their enhanced muscular resilience and neuromuscular efficiency. A well-thought-out training program incorporating plyometrics, strength training, endurance work, and sport-specific skills is essential. Plyometric exercises are high-intensity, explosive movements that involve rapid stretching and contracting of muscles, such as jumping, hopping, and bounding. These exercises improve power, speed, and agility. Generally, 1-3 sessions per week are recommended for most individuals to allow for adequate recovery and prevent overtraining. ###ARTICLECombining physical fitness and mental stamina is not easy, but it's rewarding in the long run. Doing multiple things at once can be challenging, just like when I built my blog with no sleep. It requires a lot of energy, both physically and mentally. It's great to listen to your body and understand its signals. This is also true for businesses - you need to know when to push forward and when to slow down. Doing plyometrics and weightlifting on the same day can be beneficial because it maximizes your time, effort, and results. So, go ahead and challenge yourself by combining these two. Remembering that flexibility and power are important when doing plyometrics, so make sure to stretch before starting. It's like getting ready for a marathon - you need to warm up first. The science says that stretching before plyometric exercises reduces the risk of injury. And, just like in life, taking risks can lead to setbacks, so it's better to be safe than sorry. So, what's the takeaway? Stretch before doing plyometrics to get the best out of both flexibility and power. It's like learning the rules before playing a game - you need to know how to play correctly to win. When it comes to fitting plyometrics into your routine, it's all about balance. You don't want to overdo it, just like managing your energy levels. Mix it up by doing plyometrics on leg days for extra power and on off days to keep the momentum going. In the end, there's no one-size-fits-all answer - you need to experiment and find what works best for you. fast to slow when it comes to programming for performance. You start with your fastest movements and progress to slower exercises. This means performing plyos first thing in a training session, like drop jumps, power cleans, or back squats. These fast movements maximize speed and power when you're fresh, but doing them after a soccer game or at the end of a session won't give you the same results. When you do plyometrics with heavy strength exercises, it's called complex training. This involves pairing weightlifting with plyos to potentiate, or increase, your force generation capabilities. For example: back squats followed by hurdle hops. Rest times vary depending on how strong you are and the exercise. If you're short on time, you can do both but need to rest less between exercises. Some people like to block their training days, doing speed/plyometric training one day and strength weights the next. But I prefer undulating weeks with either high and low days or an upper/lower split. High days combine plyos and weights, while low days focus on hypertrophy. To train for performance, you need to do your plyometrics before or during lifting. Doing it after can make you tired faster, reducing your physical output. Instead, try doing a leg day with plyos when that's the only time you're training that muscle group. To supercharge your nervous system, you need to understand the Post Activation Potentiation (PAP) response. This phenomenon occurs when your muscles contract after a conditioning activity, increasing energy availability and leading to increased actin-myosin crossbridging. This process enhances force generation capacity, but it's more effective at low-frequency contractions. The PAP response is believed to be caused by a combination of muscular and neural mechanisms. Muscular mechanisms involve the activation of myosin light chain kinase, which increases energy availability. Neural mechanisms involve the conditioning activity increasing the drive of the neural system, making everything more sensitive. This increased neural drive can occur through factors like increased motor unit recruitment or synchronization. The primary benefit of PAP is an acute increase in power output. Research has shown that a 2 cm increase in jump height, a 0.1-second reduction in sprint time, and a 7-8% increase in peak power output are all possible after performing a conditioning activity. However, the long-term performance benefits come from eliciting greater power outputs in training. This means operating at higher intensities and should lead to significant performance improvements. Complex training has been shown to outperform contrast training, with greater improvements in vertical jump height and sprint performance. To make the most of PAP, you need to understand how different factors affect it. Volume is important, as multiple sets are more effective than a single set. Rep range also plays a role, with 1-5 reps being optimal for inducing a PAP response. Intensity is defined as a percentage of your one rep max in strength training and research. Rest periods between conditioning activities and PAP exercises elicit the most significant response, typically anywhere from 5+ minutes. However, rest period intervals can vary based on the conditioning activity used. Pre-conditioning exercises like back squats and bench presses are common, but plyometric exercises may be more potent for inducing a PAP response. Post-activation potentiation protocol has proven to be effective in enhancing power output and performance. Sprinting and explosive exercises such as jumps, throws, and upper body ballistic movements have shown the strongest benefits [1]. In fact, a study found that sprinting was the most beneficial exercise for inducing post-activation potentiation, with other exercises like jumping and throwing not far behind [1]. Interestingly, some strength & conditioning coaches are using post-activation potentiation as a skill in itself. For example, a golfer may swing their club as fast as possible to induce a PAP response, while a boxer might throw powerful rear hands against a bag. However, it's essential to note that not all athletes benefit equally from post-activation potentiation. Studies have shown that stronger athletes tend to respond better to this protocol than weaker ones [1]. In fact, research suggests that athletes who have trained for more than two years in the gym show the greatest response to post-activation potentiation. But what about those who are new to weightlifting or have a low training age? For them, it's recommended to ignore the PAP protocol altogether. Instead, they can focus on other forms of exercise that don't require such high levels of intensity and power output [1]. Weaker athletes, however, can still benefit from post-activation potentiation with some modifications. These include longer rest periods after pre-conditioning exercises (more than 8 minutes), using sub-maximal loading instead of maximum loads, and performing shallow squats (half or quarter depth) instead of deep ones. ###EXAMPLES OF POST-ACTIVATION POTENTIATION COMPLEXESWhen considering how often to engage in plyometric training, it's essential to understand what plyometrics trains and the adaptations that occur as a result. The primary adaptation to plyometric training is neural, affecting the nervous system. This means that the body needs more time to recover from the intense neural impulses generated by plyometric exercises. Given this understanding, it's recommended to perform plyometric training 2-3 times per week, with at least one day of recovery in between sessions. This frequency allows for adequate recovery time for the nervous system and also considers the impact on active and passive structures (muscles, tendons, ligaments) that increases with higher training intensity. Higher training intensities require more recovery time, suggesting a maximum of 2 training sessions per week, with at least 2 days of recovery in between. The training intensity can be quantified by the impact or stretch-load placed on the body, such as drop jumps from different heights (e.g., 30 centimeters, 40 centimeters), which not only intensify the plyometric exercise but also help profile the athlete based on their demands. Ultimately, the choice of plyometric training frequency depends on your specific goals and the demands of your sport. By understanding these factors and adapting your training schedule accordingly, you can optimize your performance and ensure effective recovery from plyometric exercises. Plyometric training is an essential component for enhancing power and explosiveness in various sports. There are two primary approaches to plyometric training: one focuses on movement patterns similar to the sport, while the other targets the nervous system maximally. In my experience working with tennis players, we often analyzed the plyometric activity within the sport, such as the split-step. This short hop before the opponent hits the ball allows the player to react quickly and maintain a competitive edge. The plyometric training for tennis typically consists of low-intensity exercises that focus on quick contact and changes of direction. However, if you want to stimulate your nervous system and improve muscle activation, you should incorporate high-intensity plyometrics into your routine. These exercises are designed to "fire" your muscles faster and more efficiently, but they require less frequent training and lower volumes compared to low-intensity plyometrics. The plyometric training volume is calculated based on the total number of repetitions, which can also be expressed in terms of total ground contacts. High-intensity plyometrics typically involve fewer repetitions and sets, while low-intensity plyometrics can be performed more frequently with higher volumes. It's essential to note that doing plyometrics every day may not be beneficial for recovery and adaptation. Plyometric training is a form of high-intensity exercise that requires adequate time to recover and adapt. Increasing the frequency of plyometric training beyond what is recommended can lead to counterproductive results and hinder progress. Plyometric training can be used to improve both sport-specific movement patterns and nervous system function. It's crucial to understand the principles of adaptation, recovery, and progression in plyometric training to maximize its effectiveness. that the list promotes "abuse and sexism, among other issues"? ... that basketball scout Tom Konchalski used players' SAT scores as a metric to evaluate them? ... that the Federation of Central America, despite being "perpetual and indissoluble", collapsed in less than one year? We see several notable events happenin this july 30th. The tour de France was won by tadej pogačar. England defeat spain 4-2 in the final of Euro. Hulk Hogan pass away at 71. There is a plane crash in amur oblast, killin 48 peopel. Armed clash erupt on cambodia-thailand bornder. Ongoing: Gaz war Russian invasion of ukraine timeline Sudanese civil war timeline. Recently, america football team from uruguay win the inaugural FIFA World Cup. But four workers get shot dead by belgium gendarmes at a strike in france. Jimmy Hoffa go missin after bein seen outside restaurant near detroit. Also, israel attack lebanon villiage of Qana, killing alot of civilian including children. Emily bronte and george pickett born on this day. 1865 was a year that would be eternaleverybody knew that. The calendar say it started on Sunday. Gregorian and Julian calendar, two different thing. People use one more then other. January 15: Union take Fort Fisher. Important for war. January 4 – New York Stock Exchange open first time. January 13 – American Civil War. Second Battle of Fort Fisher. Union win big. January 15 – Union also capture Fort Fisher. Big deal. February 3 – Hampton Roads Conference. Union and Confederate talk peace. February 8 & March 8 – Gregor Mendel read paper about plants. Important for science. February 21 – John Deere get patent for plough. February 22 – Tennessee abolish slavery. New law. February American Civil War: Columbia burn down. Confederates flee. March 3 – U.S. Congress create Bureau of Refugees, Freedmen and Abandoned Lands. March 4 – Washington College and Jefferson College merge. March 13 – Confederate agree to use African American troops. March 18 – Congress adjourn for last time. March 19–21 – Battle of Bentonville. Union win big. March 25 Claywater Meteorite explode. Small, but important. American Civil War: Lee's army suffer heavy loss. Defeat near. March – Hamm's Brewery open in St. Paul. Minnesota. April 2: Jefferson Davis flee. April 9: Appomattox Court House. Robert E. Lee surrender. End of war. April 14: Lincoln shot. Assassination. April 1 – Battle of Five Forks. Confederate General start final offensive. April 2 – Confederate President and Cabinet leave Richmond. Union take city. April 6 – BASF founded in Mannheim. Germany. April 9 – Robert E. Lee surrender to Ulysses S. Grant. End of war. April 14: Abraham Lincoln die. Shot by John Wilkes Booth. Vice President Andrew Johnson become president. April 18 – Confederate President and Cabinet arrive in Charlotte. North Carolina. April 21 – BASF move headquarters. April 26 American Civil War: Joseph E. Johnston surrender to Union Major General William Tecumseh Sherman. April 27 Steamboat Sultana explode and sink. Kill 1,800 people. Mostly Union soldiers. April 27: Government of New deal with Charlotte. May 1 – Reuben Fenton signs the bill formally creating Cornell University. ###ARTICLENovember brought significant events as the American Civil War continued to unfold. Confederate Captain Henry Wirz was hanged for war crimes, becoming one of only two combatants executed during the conflict. The Duar War between Britain and Bhutan concluded with the Treaty of Sinchula, where Bhutan ceded control of its southern passes in exchange for a British subsidy. In the Chincha Islands War, Spanish forces were captured by Chilean and Peruvian ships off the coast of Valparaíso. Meanwhile, United States Congress created two new committees: Appropriations and Banking and Commerce, reducing the workload of the Ways and Means Committee. The Thirteenth Amendment to the US Constitution was ratified, effectively outlawing slavery in all remaining states. King Leopold II ascended to the Belgian throne following his father's death. December saw significant milestones as well. Jonathan Shank and Barry Ownby founded the Ku Klux Klan, aiming to intimidate carpetbaggers, scalawags, and freedpeople. A forest fire near Silverton, Oregon, ravaged over a million acres of timber. The National Temperance Society and Publishing House was established by James Black in the United States. Notable individuals born during this period included Julio Garavito Armero, an astronomer; Leo Ditrichstein, a stage actor; and Lala Lajpat Rai, leader of the Indian independence movement. August 17th marked the passing of Julia Marlowe, an English-born American stage actress who left a lasting legacy in the world of theater. The 18th century was a transformative period that marked significant changes in politics, economy, and society. It began on January 1, 1701, and ended on December 31, 1800, with various events shaping its course. The year 1789 witnessed the Storming of the Bastille, an iconic event of the French Revolution, which signaled the beginning of a new era in European history. ###ARTICLEThe early 18th century saw a significant shift in global power dynamics, as the French Revolution of 1789 marked the end of absolute monarchy and the beginning of a new era of democracy and Enlightenment ideals. This period coincided with the rise of Britain as the dominant world superpower, which would go on to shape the course of European history. ###ARTICLEThe year 1713 marked a significant point in history, as the Kangxi Emperor acknowledged the full recovery of the Chinese economy since its peak during the Ming dynasty. Meanwhile, in Amsterdam, Daniel Gabriel Fahrenheit invented the mercury-in-glass thermometer, which would remain the most reliable and accurate thermometer until the electronic era. In Europe, the first Jacobite rising broke out in 1715, with the British halting the Jacobite advance at the Battle of Sheriffmuir; this battle also saw fighting at Preston. On the other side of the continent, the Sikh Confederacy was established along the present-day India-Pakistan border in 1716. A series of conflicts took place across various regions, including the Austro-Venetian-Turkish War from 1716 to 1718, and the Battle of Karnal in 1739, where Nader Shah defeated a pan-Indian army of 300,000. Taxation was stopped in Iran for three years following this battle. The Ottoman Empire experienced a period known as the Tulip period from 1718 to 1730. The year 1720 saw significant events, including the South Sea Bubble and the Great Plague of Marseille. In Tibet, Qing forces ousted Dzungar invaders from 1720 onwards. The Great Northern War came to an end with the signing of the Treaty of Nystad in 1721. However, conflicts continued across various regions, such as the Russo-Persian War from 1722 to 1723 and a famine that struck across the Sahel from 1738 to 1756. In Europe, the War of the Austrian Succession and the First Carnatic War took place between 1740 and 1748. The Maratha invasions of Bengal began in 1741 and lasted until 1751. The Irish economic independence movement started during this period. The extinction of the Scottish clan system came with the defeat of the clansmen at the Battle of Culloden in 1746. In the Americas, George Whitefield brought the First Great Awakening to New England in 1740.1765–1767: Birmese invade Thailand and utterly destray Attuthaya city, securing an authoritery regime. 1766: Christian VII becomes king of Denmark, rulin for almost 40 years. 1768–1772: War of the Bar Confederation occures in Germany. 1770–1771: Famine in Czech lands kills hundreds of thousands peopel. 1775: East India Company starts operashuns in Bengal to smuggle opium into China. 1775–1783: American Revolutionary War occures, with George Washington as the first President of the United States. 1776: Illuminati founded by Adam Weishaupt, a secrect society. 1778: James Cook becoms the first Europian to land on Hawaiian Islands, explorin new lands. 1779–1879: Xhosa Wars occures in South Africa between Britten and Boer settlers. 1780: Outbreak of indigenous rebellion against Spanish colonization led by Túpac Amaru II in Peru. 1781–1785: Serfdom abolished in Austrian monarchy, giving peopel more freedom. 1783: Treaty of Paris formally ends American Revolutionary War, endin a long period of conflict. 1785–1791: Imam Sheikh Mansur leads holy war against Russian settlers and military bases in Caucasus region. 1789: French Revolution occures, with Georges Washington elected President of United States. The Hawkesbury and Nepean Wars, which were a series of incidents between settlers and New South Wales Corps and the Aboriginal Australian clans of the Hawkesbury river in Sydney, Australia. 1795: The Marseillaise is officially adopted as the French national anthem.Napoleon at the Bridge of the Arcole 1795: The Battle of Nu'uanu in the final days of King Kamehameha I's wars to unify the Hawaiian Islands. 1795–1796: Iran invades and devastates Georgia, prompting Russia to intervene and march on Tehran. 1796: Edward Jenner administers the first smallpox vaccination; smallpox killed an estimated 400,000 Europeans each year during the 18th century, including five reigning monarchs.[30] 1796: War of the First Coalition: The Battle of Montenotte marks Napoleon Bonaparte's first victory as an army commander. 1796: The British eject the Dutch from Ceylon and South Africa. 1796–1804: The White Lotus Rebellion against the Manchu dynasty in China. 1797: John Adams is elected the second President of the United States; he serves until 1801. 1798: The Irish Rebellion fails to overthrow British rule in Ireland. 1798–1800: The Quasi-War is fought between the United States and France. 1799: Dutch East India Company is dissolved. 1799: Austro-Russian forces under Alexander Suvorov liberates much of Italy and Switzerland from French occupation. 1799: Coup of 18 Brumaire - Napoleon's coup d'etat brings the end of the French Revolution. 1799: Death of the Qianlong Emperor after 60 years of rule over China. His favorite official, Heshen, is ordered to commit suicide. 1800: On 1 January, the bankrupt VOC is formally dissolved and the nationalized Dutch East Indies are established.[31] Main articles: Timeline of historic inventions § 18th century, and Timeline of scientific discoveries § 18th century The spinning jenny 1709: The first piano was built by Bartolomeo Cristofori 1711: Tuning fork was invented by John Shore 1712: Steam engine invented by Thomas Newcomen 1714: Mercury thermometer by Daniel Gabriel Fahrenheit 1717: Diving bell was successfully tested by Edmond Halley, sustainable to a depth of 55 ft c. 1730: Octant navigational tool was developed by John Hadley in England, and Thomas Godfrey in America 1733: Flying shuttle invented by John Kay 1736: Europeans encountered rubber – the discovery was made by Charles Marie de La Condamine while on expedition in South America. It was named in 1770 by Joseph Priestley c. 1740: Modern steel was developed by Benjamin Huntsman 1741: Vitus Bering discovers Alaska 1745: Leyden jar invented by Ewald Georg von Kleist was the first electrical capacitor 1751: Jacques de Vaucanson perfects the first precision lathe 1752: Lightning rod invented by Benjamin Franklin 1753: The first clock to be built in the New World (North America) was invented by Benjamin Banneker. 1755: The tallest wooden Bodhisattva statue in the world is erected at Puning Temple, Chengde, China. 1764: Spinning jenny created by James Hargreaves brought on the Industrial Revolution 1765: James Watt enhances Newcomen's steam engine, allowing new steel technologies 1761: The problem of longitude was finally resolved by the fourth chronometer of John Harrison 1763: Thomas Bayes publishes first version of Bayes' theorem, paving the way for Bayesian probability 1768–1779: James Cook mapped the boundaries of the Pacific Ocean and discovered many Pacific Islands 1774: Joseph Priestley discovers "dephlogisticated air", oxygen The Chinese Putuo Zongcheng Temple of Chengde, completed in 1771, during the reign of the Qianlong Emperor. 1775: Joseph Priestley's first synthesis of "phlogisticated nitrous air", nitrous oxide, "laughing gas" 1776: First improved steam engines installed by James Watt 1776: Steamboat invented by Claude de Jouffroy 1777: Circular saw invented by Samuel Miller 1779: Photosynthesis was first discovered by Jan Ingenhousz 1781: William Herschel announces discovery of Uranus 1784: Bifocals invented by Benjamin Franklin 1784: Argand lamp invented by Aimé Argand[32] 1785: Power loom invented by Edmund Cartwright 1785: Automatic flour mill invented by Oliver Evans 1786: Threshing machine invented by Andrew Meikle 1787: Jacques Charles discovers Charles's law 1789: Antoine Lavoisier discovers the law of conservation of mass, the basis for chemistry, and begins modern chemistry 1798: Edward Jenner publishes a treatise about smallpox vaccination 1798: The Lithographic printing process invented by Alois Senefelder[33] 1799: Rosetta Stone discovered by Napoleon's troops Main articles: 18th century in literature and 18th century in philosophy 1703: The Love Suicides at Sonezaki by Chikamatsu first performed 1704–1717: One Thousand and One Nights translated into French by Antoine Galland. The work becomes immensely popular throughout Europe. 1704: A Tale of a Tub by Jonathan Swift first published 1712: The Rape of the Lock by Alexander Pope (publication of first version) 1719: Robinson Crusoe by Daniel Defoe 1725: The New Science by Giambattista Vico 1726: Gulliver's Travels by Jonathan Swift 1728: The Dunciad by Alexander Pope (publication of first version) 1744: A Little Pretty Pocket-Book becomes one of the first books marketed for children 1748: Chushingura (The Treasury of Loyal Retainers), popular Japanese puppet play, composed 1748: Clarissa; or, The History of a Young Lady by Samuel Richardson 1749: The History of Tom Jones, a Foundling by Henry Fielding 1751: Elegy Written in a Country Churchyard by Thomas Gray published 1751–1785: The French Encyclopédie 1755: A Dictionary of the English Language by Samuel Johnson 1758: Arithmetika Horvatzka by Mihalj Šilobod Bolšić 1759: Candide by Voltaire 1759: The Theory of Moral Sentiments by Adam Smith 1759–1767: Tristram Shandy by Laurence Sterne 1762: Emile: or, On ###1751: The Art of Fugue by J.S. Bach was completed in this year. The 18th century was a time of great change and development in Europe and beyond. The year 2005 marked the release of Bagpipes in Babylon, a book by Simon Harvey that explores his lifetime experiences in the Arab world and other parts of the globe. This publication is notable for its connection to another important historical event, yellow fever, which struck Philadelphia in 1793. Medical history also played a significant role during this period, as evident in Edward Jenner's work on smallpox and vaccination. His research had a profound impact on public health and has continued to influence medical practice to this day. The world of graphic design was also evolving during the 18th century, with notable figures such as Philip B. Meggs and Jeremy Black contributing to the field. Their work provides valuable insights into the artistic and cultural developments of the time. Fictional works from the period often explored themes of generosity and obligation, reflecting the social norms of the era. Writers like William Langer and Cynthia Klekar examined these topics in their research. A range of reference texts was also produced during this century, including An Encyclopedia of World History by William Morris and A Dictionary of Eighteenth-Century World History by Jeremy Black. These works offer detailed information on historical events and cultural movements. The Wallace Collection in London houses an impressive collection of 18th-century decorative arts from France, England, and Italy. The collection features paintings, furniture, porcelain, and gold boxes, providing a unique glimpse into the art and craftsmanship of the time.