## May 7, 1915
# GERMAN TORPEDOES SINK THE *LUSITANIA*

*When a German submarine off the coast of Ireland sank the Cunard liner the* Lusitania, *more than twelve hundred passengers died. The event sparked a serious diplomatic controversy among the United States, Great Britain, and Germany.*

**LOCALE:** North Atlantic Ocean

**CATEGORIES:** World War I; wars, uprisings, and civil unrest; military history; diplomacy and international relations

**KEY FIGURES**

*Alfred Thayer Mahan* (1840-1914), renowned naval strategist of the late nineteenth century

*Alfred von Tirpitz* (1849-1930), head of the German navy

*William Thomas Turner* (1856-1933), captain of the *Lusitania*

*Woodrow Wilson* (1856-1924), president of the United States, 1913-1921

**SUMMARY OF EVENT**

The sinking of the *Lusitania* was the result of a naval strategy whose foundation lay in the writings of the renowned geopolitical theorist and naval historian Alfred Thayer Mahan. Firmly rooted in the Western imperialism that dominated much of the period, Mahan's writings emphasized the connection between a nation's ability to project its power around the world and the likelihood of its success in the international arena. A nation's destiny, Mahan believed, was directly affected by the size and power of its navy.

Mahan eventually developed a naval strategy in which the goal was to destroy a potential adversary's fleet completely. This destruction, Mahan said, would occur as the result of a single violent naval encounter that would cripple an opponent's ability to make war. Victory at sea would allow a nation to blockade its opponent's harbors and would eventually prevent an enemy from conducting international trade. This, in turn, would create economic chaos in the enemy nation, which would gradually lead to the opposing government's political downfall and eventual collapse.

Mahan also theorized that a weaker naval power could focus its energy on targeting its opponent's merchant fleet. In fact, this had been the objective in many of history's naval battles, but Mahan believed that naval warfare in the twentieth century would be characterized by large, powerful navies that fought desperate battles on the high seas. This scenario gave birth to his "decisive battle theory," which dominated the strategies of the world's major naval powers for many decades.

The modern German nation was founded in January of 1871. A quarter of a century later, Alfred von Tirpitz was placed in charge of the new German navy, and over time he became the nation's first important naval strategist. His philosophy was deeply influenced by Mahan's writings, especially the aspect that placed great emphasis on the creation of a strong, modern battle fleet. Building on Mahan's decisive battle theory, Tirpitz constructed a German naval strategy known as "risk theory," a battle plan aimed at reducing Great Britain's naval superiority. Tirpitz believed that the only way Germany could challenge British supremacy was to create a navy that was so powerful that Great Britain would never risk a naval confrontation.

Tirpitz began a massive buildup of naval arms that called for the creation of a sixty-ship German navy, two-thirds of which would be battleships. By the first decade of the twentieth century, however, it was obvious that Germany would be unable to sustain such a costly military presence on the world's oceans. In reaction to this reality, German naval strategists created a new theory that synthesized Mahan's concept of targeting an opponent's merchant fleet with his emphasis on the decisive battle. The submarine, which had the advantages of being small, inexpensive, and able to surprise much larger ships, was to play a pivotal role in this new naval paradigm.

In the weeks following the outbreak of World War I, Great Britain and Germany targeted each other with naval blockades in an attempt to deprive the opposing military of needed materials. England used its navy, the largest in the world, to intercept merchant ships from neutral nations in an attempt to stop the flow of important resources to Germany. Initially, Americans were concerned about the fact that many American ships were taken to British ports and held for a number of weeks while the English military searched for contraband. Despite the fact that such action curtailed the freedom of the United States to take part in international trade, the situation never reached a crisis level, for the most part because Americans believed that Great Britain would make financial restitution for all the materials seized once hostilities were over.

Germany, on the other hand, was becoming increas-

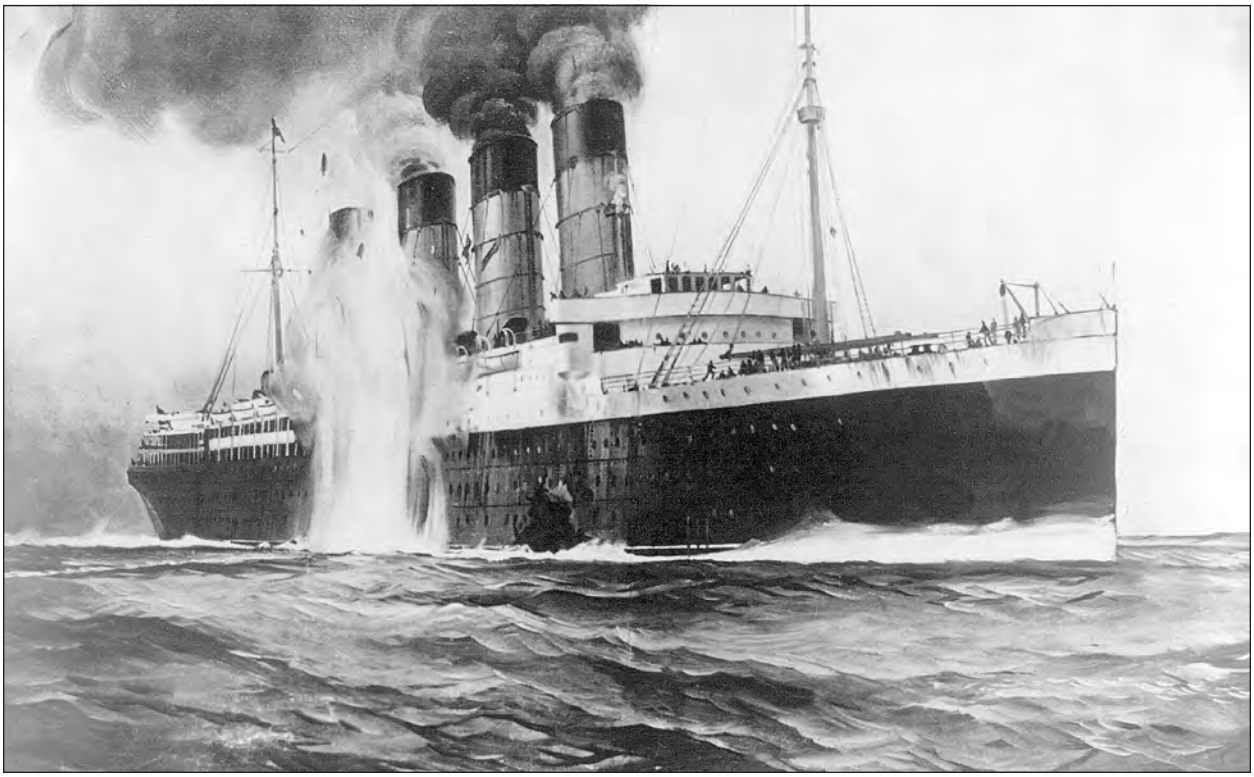
ingly concerned about the development of an undeclared alliance between the United States and Great Britain: Every time a potential controversy about the British blockade appeared, the United States seemed more than willing to accept a compromise. Furthermore, German intelligence had collected evidence that American arms were flowing directly into English ports. German agents were positive that Great Britain was using passenger liners such as the *Lusitania* to transport large amounts of weapons and ammunition.

The German high command believed that the Anglo-American relationship posed a direct threat to German security, and it reacted to the challenge by issuing a proclamation. This document asserted that as of January, 1915, the German war zone included the entire area around the British Isles, and it went on to declare that, as of February 4, all ships believed to be delivering contraband to Great Britain would be attacked. The German navy would employ submarines to enforce the newly established quarantine around the British Isles.

German submarine tactics were based on a modified version of Mahan's and Tirpitz's theories: These attacks focused on destroying Britain's ability to wage war by disrupting its capacity to conduct international trade. The Germans realized, however, that the fruits of their labors would come not from one major battle but from a prolonged and extensive interdiction of supplies headed for England. This approach, the Germans hoped, would result in the defeat of both Great Britain and its system of alliances. The 1,201 passengers killed—including 128 Americans—aboard the *Lusitania* were among the first victims of the German's submarine-based strategy.

In the days leading up to their voyage, passengers booked on the *Lusitania* read notices published by the German government in various New York City newspapers warning them that they would be sailing into the newly established war zone. In fact, shortly before the *Lusitania* reached the critical area, the ship's captain, William Thomas Turner, received a message from the English high command informing him that there had been a number of submarine sightings in his vicinity. Twelve hours later, on the morning of May 7, 1915, the *Lusitania* was enveloped by a thick fog off the coast of Ireland. In an attempt to navigate through an area of low visibility, Captain Turner reduced the ship's speed, and he also stopped the zigzag pattern that was part of the





*A 1915 artist's rendition of the torpedoing of the* Lusitania. (Library of Congress)

### GERMANY'S WARNING TO *LUSITANIA* PASSENGERS

*Passengers on the* Lusitania *knew that the German government had issued the following warning to all travelers, but few took the threat seriously.*

**NOTICE!**

Travellers intending to embark on the Atlantic voyage are reminded that a state of war exists between Germany and her allies and Great Britain and her allies; that the zone of war includes the waters adjacent to the British Isles; that, in accordance with formal notice given by the Imperial German Government, vessels flying the flag of Great Britain, or any of her allies, are liable to destruction in those waters and that travellers sailing in the war zone on ships of Great Britain or her allies do so at their own risk.

IMPERIAL GERMAN EMBASSY
WASHINGTON, D.C., APRIL 22, 1915

standard operating procedure followed to avoid enemy submarines. These two decisions enabled a German U-boat to target and launch an attack against the passenger liner. A torpedo hit the ship, exploded, and was followed a few moments later by a second, more devastating explosion that ripped a large hole in the ship's side. Eighteen minutes later, the *Lusitania* had sunk to the bottom of the ocean.

**SIGNIFICANCE**

The British government immediately denounced the attack and vehemently denied that the second explosion was the result of contact between the German torpedo and a large cache of contraband weapons. Descriptions of the disaster led to a number of violent uprisings across the British Isles against English citizens of German ancestry, and in the United States a small contingent lobbied for a declaration of war. Although most Americans rejected military intervention, many supported the British cause.

Most important, the event prompted President Woodrow Wilson to draw a "line in the sand," informing the Germans that the United States would take military action against them if they did not stop the unrestricted use of submarines. The German government agreed to Wilson's demands and signed the Sussex Pledge, in which Germany promised to curtail the strategy of unrestricted submarine warfare. Early in 1917, however, the German military resumed submarine operations, and this action was one of the primary reasons the United States became a combatant nation in World War I.

—*Richard D. Fitzgerald*

**FURTHER READING**

Butler, Daniel Allen. *The Lusitania: The Life, Loss, and Legacy of an Ocean Legend*. Mechanicsburg, Pa.: Stackpole Books, 2000. Provides the reader with important firsthand accounts of the sinking of the *Lusitania*.

Kagan, Donald. *On the Origins of War and the Preservation of Peace*. New York: Anchor Books, 1995. Offers an excellent account of German naval strategy during World War I.

O'Sullivan, Patrick. *Lusitania*. Dobbs Ferry, N.Y.: Sheridan House, 2000. Discusses the importance of the sinking of the *Lusitania* to the overall outcome of World War I.

**SEE ALSO:** June 28-Aug. 4, 1914: Outbreak of World War I; June 28, 1914-Nov. 11, 1918: World War I; Sept. 22, 1914: Germany Begins Extensive Submarine Warfare; Apr. 6, 1917: United States Enters World War I; Apr. 13, 1917: U.S. Curtails Civil Liberties During World War I; July 8, 1917: United States Establishes the War Industries Board.

## May 20, 1915
# Corning Glass Works Trademarks Pyrex

*Corning trademarked the name Pyrex for the heat-resistant borosilicate glass it had developed previously and began marketing the material for bakeware and laboratory applications.*

**Locale:** Corning, New York
**Categories:** Science and technology; inventions

### Key Figures
*Jesse T. Littleton* (1888-1966), American physicist
*Eugene C. Sullivan* (1872-1962), American scientist and founder of Corning's research laboratories
*William C. Taylor* (1886-1958), American scientist

### Summary of Event
The first use of Corning's heat-resistant glass for cooking occurred in 1913. Various stories abound regarding this event. According to one version, Jesse T. Littleton's wife broke a casserole in which she was about to bake a pudding, so she substituted the only vessel available, the cut-off bottom of a battery jar made of heat-resistant glass. The result was "so surprisingly good" that Corning Glass Works immediately instituted trials, furnishing the wives of laboratory technicians with glass dishes to be used in all kinds of baking. Following these successful experiments, the marketing of Pyrex bakeware began in 1915. The actual event was somewhat less serendipitous and more systematic. To place it in perspective, it is necessary to review the history of Corning Glass Works to see why the company produced a heat-resistant glass with no apparent plans to use it in the kitchen or the laboratory.

By the beginning of the twentieth century, Corning had a reputation as a company that cooperated with the world of science to improve existing products and develop new ones. In the 1870's, Corning had hired university scientists to advise on improving the optical quality of glasses, an early example of today's common practice of academics consulting for industry. The company had worked with Thomas Alva Edison to produce blanks for his new incandescent lamps. It had also made lenses for railroad signal lanterns, and Corning's colorants for lens glass were accepted in 1908 by the Railway Signal Association as the standard for the industry. This is the avenue that led to the heat-resistant glass.

Lenses for oil or gas lanterns were vulnerable to weather damage; that is, they could shatter if they were sprayed with cold rain or wet snow after being heated by the flame that produces the light. When a lens in a red "stop" light broke, the lantern appeared to be giving a clear "proceed" signal; this problem caused many accidents and near misses in railroading in the late nineteenth century. When Eugene C. Sullivan established Corning's research laboratory in 1908 (the first of its kind devoted to glass research), the task that he undertook with his assistant William C. Taylor was that of making a heat-resistant glass for railroad lantern lenses.

The problem was that ordinary flint glass (the kind in bottles and windows, made by melting together silica sand, soda, and lime) has a fairly high thermal expansion but a poor heat conductivity. This means that when it is heated, the outer parts can expand greatly, long before the inner parts are heated at all; conversely, when it is cooled, the outer parts can contract before the inner parts cool. Either situation can cause the glass to break, sometimes violently.

Two solutions were possible: improvement of the thermal conductivity and reduction of the thermal expansion. The first is what metals do; most metals have an expansion with heat much greater than that of glass, but they conduct heat so quickly that they expand nearly equally throughout and seldom lose structural integrity from uneven expansion. Glass, however, is inherently a poor heat conductor, so this approach was not possible. Sullivan and Taylor had to find a formulation that had little or no thermal expansivity. Pure silica (one example is quartz) fits this description, but it is expensive and, with its high melting point, very difficult to work. The formulation that Sullivan and Taylor devised was a borosilicate glass, essentially a soda-lime glass with the lime replaced by borax, with a small amount of alumina added. This gave the low thermal expansion needed for signal lenses. It also turned out to have good acid resistance, which led to its being used for the battery jars required for railway telegraph systems and other applications. Corning marketed this glass as Nonex (for "nonexpansion glass").

Littleton joined Corning's research laboratory in 1913. The company had a very successful lens and battery jar material, but no one had even considered it for cooking or other heat-transfer applications, because prevailing opinion was that glass absorbs and conducts heat poorly. This meant that in glass pans, cake batters, pies, and other baked foods would cook on the top, where they were exposed to hot air, but would remain cold and wet (or at least undercooked) next to the glass surfaces. Further, stove burner operations were out of the question. As

a physicist, Littleton knew that glass absorbs radiant energy very well. This solved the heat-conduction problem by giving a source of heat in the glass vessel. It would also give glass a significant advantage over metal in baking. Metal bakeware mostly reflects radiant energy to the walls of the oven, where it is lost ultimately to the surroundings. Glass would absorb this radiant energy and conduct it evenly to the vessel's contents, giving a better result than that of the metal bakeware. Moreover, glass would not absorb and carry over flavors from one baking to the next, as some metals do.

Littleton took a cut-off battery jar made of Nonex home with him and asked his wife to bake a cake in it. He then took the cake to the laboratory the next day and handed pieces around, not disclosing the method of baking until all had agreed that the results were excellent. With this agreement, he was able to commit laboratory time to developing variations on the Nonex formula that were more suitable for cooking. The result was Pyrex, patented and trademarked in May, 1915. Although the patents have long since expired, the trademark remains the property of Corning. The etymology of the name is interesting. The association with the Greek root *pyr* (fire) is only fortuitous; the original intent was to model the name on the existing Nonex, but with the word "pie" substituted before the suffix, as the first piece explicitly fabricated as a baking dish was a pie plate.

Initial sale of Pyrex bakeware took place at the Jordan Marsh department store in Boston in 1915. In addition to the pie plate, the company offered cake pans, custard cups, and bread pans. Within a short time, Americans overcame their skepticism about glass as a cooking material, and in 1919 more than 4.5 million pieces of Pyrex bakeware were sold. In the 1930's, Corning introduced Pyrex Flameware, with a new glass formulation that could withstand the extreme heat of stove-top cooking. The cookery revolution was complete.

In the same year Corning began marketing Pyrex for cooking, the company also introduced Pyrex laboratory glassware. At the beginning of the twentieth century, the glassware used in American laboratories came from Germany. After World War I cut off the supply, Corning filled the gap with Pyrex beakers, flasks, and other items, and, by the end of the war, the Pyrex products were so well entrenched that they remained. Today, Corning-style glassware is found in laboratories all over the world.

### SIGNIFICANCE

Corning's introduction of Pyrex cookware brought a wide range of products, in an entirely new material, to American kitchens and, within a very few years, to kitchens around the world. In the years after Flameware was introduced, Corning went on to produce a variety of other products and materials, such as tableware in tempered opal glass; cookware made of Pyroceram, a glass product made crystalline by heat treatment with such mechanical strength as to be virtually unbreakable; and even hot plates and stoves topped with Pyroceram. It became possible to outfit a kitchen and dining room exclusively with heat-resistant glasses or glass-ceramics, although most households continued to mix these with dishes and cookware in metals and conventional ceramics. The revolution that Corning brought to the kitchen was a revolution by way of addition to existing materials and methods.

In the laboratory, in contrast, the revolution was one of total replacement. The delicate blown-glass equipment from Germany that had previously been the standard was completely displaced by the more rugged and heat-resistant machine-made Pyrex ware. Any number of operations are possible with Pyrex that cannot be performed safely using vessels made of flint glass: Test tubes can be thrust directly into burner flames, with no preliminary warming; beakers and flasks can be heated on hot plates, unlike flint glass, which (because contact and heat transfer occur at only a few points) almost inevitably shatters when heated this way; materials that dissolve with evolution of heat, such as sodium or potassium hydroxide, can be made into solutions directly in Pyrex storage bottles, a process that would leave the benchtop and the floor covered with hot caustic solution if carried out in regular glass; thermometers can be placed directly into heating baths 300 degrees or more above room temperature.

The list of heating and cooling operations that can be done in Pyrex or other borosilicate vessels (for example, Kimble's Kimax) and cannot be done in regular glass can be expanded almost indefinitely. It is safe to say that in any laboratory doing "wet chemistry" (that is, syntheses and analyses in solution in water or other solvents), if all glassware were replaced overnight with that used before Pyrex was developed, work would immediately stop. Weeks would go by while chemists and technicians retrained themselves in different techniques and slowly reached their previous level of activity. Pyrex revolutionized laboratory practices.

Other unique applications found for Pyrex since its introduction in 1915 include as the material of choice for lenses in the great reflector telescopes, beginning in 1934 with that at the Palomar Observatory in California. By its nature, astronomical observation must be done with the scope open to the weather. This means that the mirror

must not change shape with temperature variations, which rules out metal mirrors. Silvered (or aluminized) Pyrex serves very well, and Corning developed great expertise in casting and machining Pyrex blanks for mirrors of all sizes. Pyrex also was found to be useful as the glass of glass fibers, whether for insulation or as a component in glass-plastic construction materials. Pyrex is less brittle than regular glass and has less of a tendency to break into tiny, needlelike shards.

*—Robert M. Hawthorne, Jr.*

### FURTHER READING

Hecht, Jeff. *City of Light: The Story of Fiber Optics*. New York: Oxford University Press, 1999. Presents the history of the development of fiber optics, in which Corning's innovations in glass products played an important role. Covers developments in the manufacture of glass since Victorian times that led up to fiber-optic technology.

Hollister, George B. "The Battery Jar That Built a Business." *Gaffer*, July, 1946, 3-6, 18. An account of the original development of Pyrex bakeware, followed by much information on manufacturing and marketing practice. *Gaffer* is an in-house publication of the Corning Glass Works.

_____. *Historical Highlights, Corning*. Corning, N.Y.: Corporate Communications Division, Corning Glass Works, 1982. Pamphlet provides a useful chronology of major events in the company's history from 1851 to 1981. Lists both technical and managerial advances.

_____. "Pyrex Brand Glass Found Suitable for Oven Cooking: 1913." In *Historical Records of Corning Glass Works 1851-1930*. Corning, N.Y.: Corning Glass Works, Archives and Records Division, 1931. Typescript from the Archives and Records Division of Corning Glass provides good technical historical background.

_____. "The Story of Pyrex and Heat Resistant Glass." *Leader*, October 21, 1968, B6. Newspaper account from the local paper in Corning, New York. Article is authoritative if brief, with some information not easily found elsewhere.

Morey, George W. *The Properties of Glass*. New York: Reinhold, 1938. Gives technical material, in tabular and discussion form, of types of glass, including Pyrex. Discusses formulations and chemical, physical, and engineering properties of different kinds of glass.

Uhlmann, Donald R. *Glass: Science and Technology*. 4 vols. San Diego, Calif.: Academic Press, 1979-1990. Standard work presents discussion of glass formulas.

**SEE ALSO:** Aug. 30, 1901: Booth Receives Patent for the Vacuum Cleaner; 1904-1912: Brandenberger Invents Cellophane; 1905-1907: Baekeland Invents Bakelite; 1917: Birdseye Invents Quick-Frozen Foods; Apr., 1930: Midgley Introduces Dichlorodifluoromethane as a Refrigerant Gas; Feb., 1935-Oct. 27, 1938: Carothers Invents Nylon.



## Summer, 1915
# DENISHAWN SCHOOL OF DANCE OPENS

*American modern dance blossomed when Ruth St. Denis and Ted Shawn established a school that fostered the talents of the first generation of great modern dancers and helped to establish American dance as a legitimate art form.*

**LOCALE:** Los Angeles, California
**CATEGORIES:** Dance; organizations and institutions

### KEY FIGURES

*Ruth St. Denis* (1879-1968), American dancer
*Ted Shawn* (1891-1972), American dancer, educator, and author
*Martha Graham* (1894-1991), American dancer
*Doris Humphrey* (1895-1958), American dancer
*Charles Weidman* (1901-1975), American dancer and choreographer
*Louis Horst* (1884-1964), American musician and teacher of dance composition

### SUMMARY OF EVENT

The marriage of Ruth St. Denis to Ted Shawn in 1914 began a partnership that contributed significantly to the development of American modern dance. The institution of Denishawn, created from the collaboration of these two dancers, emerged in the first few decades of the twentieth century as the impetus for a dance school, a pedagogic theory, and a performing company.

Ruth St. Denis and Ted Shawn officially acquired the name Denishawn on February 6, 1915. A theater man-

*An outdoor performance by some of the students of the Denishawn School.* (Library of Congress)

ager ran a promotion in which contestants competed to name a ballroom dance that the couple performed on the vaudeville circuit. The winning name, Denishawn, then became the official title of the dance school directed by St. Denis and Shawn. The first Denishawn school was established in Los Angeles during the summer of 1915 as the Ruth St. Denis School of Dancing and Its Related Arts. In the summer of 1916, however, the school underwent a name change and became known thereafter as the Denishawn School.

Known for her exotic and highly theatrical dances, St. Denis supplied inspiration and an image of glamour and spirituality to the Denishawn School. She emphasized the dance techniques of the East and included the history and philosophy of dance within her classes. St. Denis also experimented with music visualization at Denishawn. In this method, the movements and rhythms of each dancer directly correspond with a specific instrument in the orchestral score. The dancers become physical manifestations of the musical notation.

St. Denis's husband and collaborator, Shawn, offered a more systematic approach to movement. He maintained respect for formalized technical dance training and helped to create a curriculum of study at the Denishawn School. Although he did not view it as an exclusive form of training, Shawn felt that some training in classical ballet was indispensable to the dancer, as long as the instructor taught with wisdom and discrimination. The Denishawn system of training included an adaptation of ballet instruction executed while barefoot. The curriculum included ethnic and folk dance in addition to training in eurythmics, in which the dancer enhanced rhythmic sense and expression through a progression of physical exercises that were originally formulated by Swiss music teacher Émile Jaques-Dalcroze. Denishawn also offered beginning German modern dance as well as training derived from the work of François Delsarte. Delsarte, a French teacher of music and acting, developed a complex system of gesture in relation to human expression. Shawn maintained that Delsarte's teaching was the first to incorporate the concepts of tension and relaxation, or contraction and release, which still serve as a foundation for much of modern dance. St. Denis and Shawn hired a disciple of Delsarte to bring this training to Denishawn.

The Denishawn system of training was eclectic yet energetic and colorful. A typical dance class at Denishawn began with stretching exercises performed with one hand on the ballet barre for support. The dancer performed a basic ballet warm-up at the barres that circumscribed the periphery of the studio and then progressed to the center of the floor. Arm exercises were executed next, in addition to a series of balletic dance combinations designed to promote strength, flexibility, and coordination. After these initial exercises, the student performed an array of ethnic dance styles, including dances of Spanish, Hungarian, Japanese, and East Indian derivation. As a closure to class work, dancers often learned an excerpt from the Denishawn repertory. A dance called *Tunisienne* promoted the dexterous use of finger cymbals. Japanese dance forms were taught through repertory dances such as *Lady Picking Mulberries*. Several other dances, such as *Serenata Morisca*, *Maria-Mari*, *Gnossienne*, and *Invocation to the Thunderbird*, originated as classroom exercises; thus performance repertory also emerged from the classroom dance combinations that St. Denis and Shawn taught at the school.

Out of the Denishawn School a dance company evolved that was destined to nurture some of the greatest

names in modern dance. St. Denis and Shawn had performed together since 1914, and with the establishment of the school in 1915, the couple began training other dancers to perform with them. The Denishawn dancers performed a repertoire that was as eclectic and vigorous as was their classroom training. In a typical Denishawn concert, the company of from seven to twelve dancers performed St. Denis's music visualizations, Spanish dances, Japanese pieces, dances sharing an Egyptian motif, and dances based on American themes. Most of the pieces were not authentic ethnic dances reflecting traditional cultural forms; rather, they were dances that retained a flavor of foreign lands. St. Denis, for example, incorporated authentic costumes and music for her Egyptian-influenced ballet *Radha*; however, the music was played on Western instruments.

Denishawn fostered and refined the talents of several dancers who would later become prominent figures in the field of modern dance. Martha Graham, Doris Humphrey, and Charles Weidman were among the early Denishawn dancers and teachers, fulfilling dual roles as performers with the company and instructors within the school. For a decade following the opening of the Denishawn School, musician and composer Louis Horst accompanied dance classes and served as musical director. Accompanied by a staff of talented artists, St. Denis and Shawn expanded Denishawn, opening an additional school in New York City and mentoring teachers of the Denishawn method in many small towns across the country.

**Significance**

The partnership of St. Denis and Shawn that propagated the Denishawn School and company lasted for eighteen years. From 1914 through 1932, the duo completed thirteen major tours of the United States and emerged as pioneers of American dance, creating an audience for the art form among the middle-class theater clientele much as the tours of Sergei Diaghilev did for ballet.

St. Denis and Shawn were advocates of diversity within the education of the dancer. They believed that a dancer must study a multitude of techniques and styles in order to become a more proficient performer. During the 1930's, Denishawn sponsored the first course in the United States that incorporated the dance technique created by German modern dance pioneer Mary Wigman. Both Shawn and St. Denis continued to study dance forms themselves in an attempt to enhance their art, and, while on tour in the Far East, the couple studied dance in Japan, China, Burma, India, and Ceylon.

Between August, 1925, and November, 1926, the Denishawn company toured the Far East and became the first American dance company to perform in the Orient. The company also performed in Great Britain, and Shawn presented a solo program during a three-month tour of Germany. St. Denis, Shawn, and the Denishawn dancers completed five individual concerts at the Lewisohn Stadium in New York City, the last of which marked the final performance of Denishawn on August 28, 1931. After this concert, the partnership of St. Denis and Shawn dissolved, and each followed an individual career in the dance world. Shawn toured with a group of male dancers and wrote several books on dance, including *Dance We Must* (1940) and *Fundamentals of a Dance Education* (1937). He taught dance at a number of colleges, thereby helping to establish and legitimate dance in academe.

In the latter part of the 1930's, Shawn formed a famous group of male dancers that toured the United States. He worked to dispel ideas of dance as solely a feminine activity and championed the cause of dance as a worthy occupation for men. Shawn consistently commissioned original music scores for his choreography and began the practice of collaboration with composers. Much of his choreography explored specifically American themes, including themes concerning early pioneers, Native Americans, and African Americans. Later, Shawn founded and directed Jacob's Pillow School of Dance in Lee, Massachusetts, which continued after his death as a prestigious summer dance program.

St. Denis focused her attention on the development of Denishawn House in New York City and continued to perform solos of a multicultural nature, including her interpretation of biblical psalms that utilized the Indian gesture language of mudras. St. Denis's major contributions to the dance world include her experimentation with music visualization and her choreography, which often accentuated mystical or religious themes. Although she was not known as a technically proficient dancer, St. Denis brought to the general populace the essence of exotic lands through her dances.

Perhaps the greatest contribution of Denishawn was its presentation of contemporary American dance as a legitimate art form. Prior to the establishment of Denishawn, dance in the United States largely consisted of performances by vaudevillians, acrobatic and novelty dancers, "hoofers," and skirt dancers. Exponents of European dance were the only dancers seriously regarded by the American public, and many talented young American performers, such as ballet dancer Augusta Maywood

and modern dancer Isadora Duncan, pursued careers in Europe. Denishawn helped to convert theatergoers to American dance and assisted in establishing it as a serious art form.

As pioneers of modern dance, St. Denis and Shawn tilled the fertile ground for the first generation of great modern dancers. Martha Graham, Doris Humphrey, and Charles Weidman were all leading dancers in the Denishawn company. In 1916, Graham entered the Denishawn School and studied almost exclusively with Shawn. Graham performed with the Denishawn company from 1919 to 1923, after which she embarked on an independent dance career that spanned almost seventy years and established her as one of the greatest figures in American modern dance. Humphrey began studies at Denishawn in 1917 and subsequently danced with the company from 1918 to 1928. In 1928, Humphrey and her partner, Weidman, left to found a school and dance company in New York City. Weidman had performed with Denishawn for the previous eight years. All of these paramount figures of modern dance were greatly influenced by the training and theatrical experience offered at Denishawn; however, they left the Denishawn company when their original ideas and independent ambitions were stifled. Critic John Martin has stated that modern dance originated more as a rebellion against the Denishawn system than as an outgrowth of it. Nevertheless, as a direct result of Denishawn and the pioneering efforts of St. Denis and Shawn, American modern dance came into existence during the 1920's.

*—John R. Crawford*

## FURTHER READING

Foulkes, Julia L. *Modern Bodies: Dance and American Modernism from Martha Graham to Alvin Ailey*. Chapel Hill: University of North Carolina Press, 2002. In-depth examination of the development of American modern dance includes discussion of Denishawn and its influence. Includes bibliography and index.

Kraus, Richard, Sarah Chapman Hilsendager, and Brenda Dixon. *History of the Dance in Art and Education*. 3d ed. Englewood Cliffs, N.J.: Prentice Hall, 1991. Comprehensive history of dance discusses the beginning years of modern dance in chapter 7, which provides an overview of Denishawn as well as information on early influences of Denishawn and brief biographies of St. Denis and Shawn. Places Denishawn in context with other events and individuals involved in the development of modern dance. Includes photographs, bibliography, and indexes.

McDonagh, Don. *Complete Guide to Modern Dance*. Garden City, N.Y.: Doubleday, 1976. Provides a concise overview of the development of Denishawn within historical and cultural context, along with biographies of St. Denis and Shawn, descriptions of nine Denishawn dances, and a chronology of the choreography of St. Denis and Shawn. Includes photographs, annotated bibliography, and index.

Shelton, Suzanne. *Ruth St. Denis: A Biography of the Divine Dancer*. 1981. Reprint. Austin: University of Texas Press, 1990. Provides an extensive account of the Denishawn School and company as well as detailed information on St. Denis's early life and career. Includes photographs, bibliography, and index.

Sherman, Jane. *Denishawn: The Enduring Influence*. Boston: Twayne, 1983. Work by a former Denishawn dancer focuses on the Denishawn School and company rather than on St. Denis and Shawn. Includes a chronology of the company, appendixes devoted to Denishawn choreography, photographs, bibliography, and index.

_____. *The Drama of Denishawn Dance*. Middletown, Conn.: Wesleyan University Press, 1979. Provides clear descriptions of specific Denishawn dances from 1914 to 1926 and offers intriguing accounts of the company's choreography. Includes many photographs never before published, a chronology of Denishawn tours, appendixes of choreography, bibliography, and index.

Terry, Walter. *Miss Ruth: The "More Living Life" of Ruth St. Denis*. New York: Dodd, Mead, 1969. Biography of St. Denis places her work with the Denishawn school within the larger context of her life and times. Includes an interesting epilogue featuring quotations from St. Denis.

Thomas, Helen. *Dance, Modernity, and Culture: Explorations in the Sociology of Dance*. New York: Routledge, 1995. Approaches the study of dance from a sociological perspective, noting the influences of societal change, economics, and popular culture on dance and other art forms. Discusses Denishawn in this context. Includes illustrations, bibliography, and indexes.

**SEE ALSO:** Dec. 26, 1904: Duncan Interprets Chopin in Her Russian Debut; June 2, 1909: Fokine's *Les Sylphides* Introduces Abstract Ballet; July 3, 1932: Jooss's Antiwar Dance *The Green Table* Premieres; Jan. 26, 1936: Tudor's *Jardin aux lilas* Premieres in London.