ANNO TEATRI

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Canon
THEATRE TECHNICAL HISTORY

Content

In this box you will find **about 130 cards**. On the front of each card, with CANON Logo, there is an event from the history of technical theatre - the introduction of a technology, the opening of a building, or the birth of a person. On the back of the card is the year, decade or century of the event, together with a short description.

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Who plays in ANNO TEATRI?

The game is suitable **for 2 - 10 players**, the ideal number is 3 to 6. For large groups, you can speed up the game by dealing each player fewer than 9 cards at the beginning.

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Categories & levels

The cards have **categories** shown on them:

person, sound, light, scenography, mechanics, sources, architecture

The cards also have 3 **difficulty levels**:

Use the categories and difficulty levels to **customise the game**, for example playing only with the cards about lighting, or only with Level 1 cards.

Getting started

Shuffle the cards and **deal 9 to each player**, with the Canon logo facing upwards. Players place their cards in front of them, without looking at the reverse side. Place the remaining cards in a pile in the middle, **Canon logo upwards.**

Important

Always keep the cards on the table during the game! Slide the cards when you move them, don‘t wave them around in the air - otherwise your fellow players will unintentionally find out the dates and information that you would be better off keeping secret.

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How to play

The aim is **to build a sequence**. Place the top card from the deck in the centre, reading out the title but keeping the date and description secret. The first player begins by choosing one of their cards, reading the title out loud and placing it above the first card if they think their event occurred before the first event or below the it if they think their event occurred after.

Continuing play

Play continues around the other players.
When it is their turn, a player can:
Add one of their cards to the chain of events.
They may insert their card anywhere in the chain, between cards that have already been laid out, or at either end, depending on where they think their event fits in the time sequence.
Or If the player thinks there is an error in the time sequence, they may **correct the sequence** by rearranging the existing cards before adding their new card. Or **doubt the sequence.**

Doubting

A player may choose not to add another card and instead publicly doubt the timing of the events. **This ends the game round, and all the cards are turned over.** If the chronological sequence is correct, the doubter **takes four new cards** from the deck. If there is any error in the sequence, the player who last put down an event **takes two new cards** from the deck. Even if it is only by a single year, and regardless of who laid the chronologically incorrect card, the previous player must take responsibility.

A new round

A new round begins with a new starting card from the deck - do not re-use the cards from the previous round. **Play begins with the player who was the doubter in the previous round.** Then it's pretty much round and round again.

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Special cases

If the player starting a new round **only has one card left,** they must take two cards from the pile instead of one, arrange them and insert his last card. The **direction of play is reversed immediately** and once as soon as a player only has two cards left.

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The winner

The winner is the player who is **the first to play their last card** - in a correct sequence, of course. The next player will certainly express doubts. If an error in the sequence comes to light, the player who played their last card takes two new cards, and the game continues.

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Details

Century: a century lasts from the year 01 to the year 00 - for example, the 20th century began in 1901 and ends with the year 2000.
Around: around means that the event cannot be fixed exactly in time. Allow 5 years either side of the date - for example, if the card says , Around 1900', the years 1895 to 1905 are considered correct.

Simultaneous and overlapping events can be in any order.

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Credits & contact

The Game ANNO TEATRI is based on the original game ANNO DOMINI by Urs Hostettler, Fata Morgana and Abacus Spiele.

The game is part of the **Erasmus+ project "CANON"**, researched and tested by its teachers and students from 8 universities in 9 European countries. ANNO TEATRI is a "work in progress", so please contact us with corrections or ideas for new events. The idea and realisation is lead by Franziska Ritter: franziska.ritter@tu-berlin.de

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CANON Project

2019 - 2022

The Erasmus+ Project **"CANON of TECHNICAL THEATRE HISTORY"** increases awareness and understanding of the history of technical theatre in Europe - its practices and technologies. Students and staff of nine European (university) institutions created this game, Anno Teatri, as well as many other outputs from the project.

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Pepper`s Ghost effect

1862

John Henry Pepper demonstrated this illusionary technique called **Pepper's Ghost**: A brightly lit figure below the stage or in the wings is reflected in a pane of glass placed at an angle on stage. To the audience, it appears as if the ghost is on stage.

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Großes Schauspielhaus, Berlin

1919

The **Großes Schauspielhaus** was a famous theatre in Berlin. It was an iconic example of expressionist architecture with sculptural columns and a cave-like auditorium decorated with stalactites. It was designed by Hans Poelzig for theatre impresario Max Reinhardt, and sat 3500 people.

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Agatharchos

5th century BC

Agatharchos was a ancient greek stage painter, reportedly mastering the art of perspective painting and using this skill to create depth on a stage with his paintings.

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Counterweight

6th century BC

Counterweights were used to operate cranes and other machinery, one example being the Deus ex machina. Counterweights date back to about the 6th century BC in ancient Greece.

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Dionysus Theatre

5th century BC

The **Dionysus Theatre** in Athens was the most important theatre in ancient Greece and is also considered the first theatre in the world. It was named after Dionysus, the god of wine, ecstasy and madness.

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Deus ex machina

4th century BC

The **Deus ex machina** was a machine in Ancient greek theatre, used to lower down an actor with the help of a crane (mechane) or lift them up through a trapdoor. The "God through the machine" solved an otherwise unsolvable situation, often to the surprise of the audience.

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Kothurn

2th century BC

The **Kothurn** was a lace-up shoe with big soles made of cork. Greek tragedy actors used these shoes on stage. Later on, in the 15th and 16th centuries, a similar shoe, called a Chopine, came into fashion in Italy and Spain.

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Ekkyklema

5th century BC

The **Ekkyklema** was a stage device in ancient greek theatre. A platform on wheels was rolled out through the skene (a door like structure in the middle back of the stage). It was often used to reveal dead bodies.

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Perspective drawing

6th century BC

Even though it was limited, a knowledge of **perspective** did already exist in ancient Greece. It was mostly limited to architectural sketches and scenography.

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Periaktos

14 BC

A **periaktos** is a triangular wooden prism to quickly change scenes and to create the illusion of depth on stage. Every one of the three sides had a different scene painted on them. By revolving the prism the scene can be changed within seconds.

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Epidaurus Theatre

330 BC

The ancient greeks built the
Epidaurus Theatre about 330 BC.
It is famous for its unique acoustics
and is still in use today.

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Colosseum, Rome

72 - 80 AD

The **Colosseum in Rome** is the biggest amphitheatre ever built with 50.000 to 80.000 audience capacity. Over 100 elevators brought animals and gladiators into the arena for spectacular fight scenes. It still exists today.

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Simultaneous stage

15th - 16th century

The **simultaneous stage** had multiple scenes all in view simultaneously. The different scenes were signified by small booths called mansions, connected by an unlocalized acting area, the platea. This kind of stage was mainly built in marketplaces.

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Chariot system

1641

In 1641 Giacomo Torellis invented the **chariot system**, to quickly change scenes on stage. Wheeled "chariots" under the stage run on tracks, carrying scenic flats which project through slots in the stage. The flats can be moved from the wings onto the stage and off again quickly, and without any visible mechanism.

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Pit

Around 1500

The **pit** was an inexpensive audience area in front of a public theatre stage, limited to English theatres. The audience in the pit was reportedly loud and often misbehaved, so it was able to significantly influence what happened on stage.

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Platea

15th century

The **Platea** is the unlocalized acting area in front of the mansions of the simultaneous stage. For each scene, the platea changes its affiliation depending on which of the mansions the actors are in, according to the plot.

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Misteri d`Elx

1523

The **Misteri d'Elx** is a mystery play representing the Assumption of Mary. The play is still performed every year on 14th and 15th August in Elx, a city in the Pais Valencià.

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Passion Valenciennes

1547

Passion Valenciennes was a major town event in the French city of Valenciennes about the life, death and passion of Jesus Christ. More than 100 roles were played by 72 actors. It is said to have taken 25 days to perform, with the action taking place on multiple stages.

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Globe Theatre, London

1599

The **Globe Theatre** in London is most closely associated with William Shakespeare and his plays. The wooden, open-air theatre held an audience of around 3000, standing in the pit or in seats wrapped around the stage. A reconstructed Globe opened in 1997.

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Giovanni Battista Aleotti

1546 - 1636

Giovanni Battista Aleotti was an Italian architect known for his intricate theatre and stage architecture. His only remaining work is the Teatro Farnese in Parma.

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Nicola Sabbatini

1574 - 1654

Nicola Sabbatini was an Italian architect. His book "Pratica di fabricar scene, e machine ne‘teatri" gives a comprehensive description of how to build a theatre. It contains detailed information and drawings of stage machinery, lighting and scenery.

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Proscenium

1619

The **proscenium** is the frame or arch separating the stage from the auditorium to hide the stage technology and create an illusionary stage space. The first modern proscenium was installed at the Farnese Theatre in Parma in 1619.

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Commedia dell`Arte

16th century

Commedia dell` Arte was an early form of professional theatre, originating in Italy. It was popular throughout Europe between the 16th and 18th centuries. It was characterised by being partly scripted and partly improvised.

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Backdrops

Around 14th century

A **backdrop** is the furthest scenic element, acting as a background to the scene. In the early days, backdrops were mostly handpainted, but now they may range from pure black to white with projections on them.

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Teatro Olimpico, Vicenza

1580

The **Teatro Olimpico** in Vicenza, Italy was built by architect Andrea Palladio. It is known for its unique stage scenery, creating depth percieved as over 100 meters, despite the stage only being 12 meters deep. It is the first free-standing autonomous theatre building.

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Teatro Farnese

1617 - 1618

The **Teatro Farnese** is a still existing Baroque theatre in Parma, Italy. It was built by architect Giovanni Battista Aleotti and can seat about 3000 people. It is one of the first proscenium arch theatres.

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Giuseppe Galli da Bibiena

1696 – 1757

Giuseppe Galli da Bibiena was a stage designer, architect and theatre engineer of the Baroque period. He is considered a master of creating the illusion of perspective on stage.

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Substage

Around 16th century

The **substage** is the space under the stage, where technical equipment is located to move scenery such as lifts and revolves. Theatres started using substage machinery in the Baroque period around the 16th century.

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Wind drum

Around 17th century

A **wind drum** is a special instrument used to produce the sound of wind. A crank is turned to rotate a large wooden cylinder, which rubs against fabric.

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Drottningholm Theatre, Stockholm

1762 - 1766

The **Drottningholm Theatre** (Slottsteater) was built between 1762 and 1766 near Stockholm by architect Carl Fredrik Adelcrantz. It is one of the best preserved Baroque court theatres, with its original stage machinery.

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The Brandt family

19th century

The **Brandt family** refers to a German dynasty of stage technicians and scenographers. They are responsible for numerous stage innovations and highly significant designs. They are an example of knowledge transfer from one generation to the next.

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Cyclorama

Around 1890

The **cyclorama** is a large, white backcloth, often semi-circular in plan and enclosing the stage. With appropriate lighting, it gives the audience the impression of an unlimited space, such as the sky.

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Invention of safety curtain

1864

The **safety curtains** are mentioned in 1864. Often known as the , iron', a safety curtain divides the stage and auditorium in the event of a stage fire, increasing the time for the audience to escape. In the era of gas lighting theatre fires were common, and safety curtains were often required by law.

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Invention of limelight

1826

Thomas Drummond invented the **limelight** in 1826. An oxy-hydrogen flame is directed at a piece of quicklime, causing it to glow with an intense white light. Limelight was the first powerful, directional light source in theatres, and led to the expression , to be in the limelight‘.

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Electric lighting mandatory in German theatres

1891

The Prussian police declared **electric lighting mandatory for all theatres in Germany.** Electric lighting was a much safer system than the previous gas lighting, and the change greatly reduced the number of theatre fires.

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First electric lighting in theatre

1881

First experiments with electric lighting were carried out at the Grand Opera in Paris in 1881. Fritz Brandt had converted the two foremost sidelights of the Staatsoper Berlin to electric operation in 1882. First theatres completely electrically equipped in 1883: Stuttgart Munich, Vienna and Brno.

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Fellner & Helmer

1873 – 1919

The Atelier **Fellner & Helmer** was a Viennese architectural firm founded by Ferdinand Fellner and Hermann Helmer. They specialised in the construction of theatres and were involved in the building of a total of 48 theatres all over Europe.

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Friedrich Kranich (junior)

1880 – 1964

Friedrich Kranich was a German stage technician and theatre scholar. His books "Bühnentechnik der Gegenwart. Teil 1 und 2" are considered to be part of the stage technics canon.

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Adolphe Appia

1862 – 1928

Adolphe Appia was a Swiss scenographer. He dedicated his life to the reform of staging – in particular for the works of Richard Wagner. He is also known for the stage designs of Festspielhaus Hellerau.

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Raumbühne

1924

The **Raumbühne** was conceived by German architect Friedrich Kiesler in 1924 and revealed first in Vienna as concept for a modern theatre. It is an open construction in which multiple stages are stacked and interlocked. You can watch the performance from any angle.

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Festspielhaus Hellerau

1911

The **Festspielhaus Hellerau** near Dresden was built in 1911 by architect Heinrich Tessenow in cooperation with composer and dance teacher Émile Jaques-Dalcroze, scenographer Adolphe Appia and lighting designer Alexander von Salzmann. It was a revolutionary design as a space for performance.

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Totaltheater

1927

The **Totaltheater** was a concept concieved by Walter Gropius and Erwin Piscator. They wanted to build a theatre combining several different stage forms. The Totaltheater was never built.

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Hanamichi

1740

The **hanamichi** is an extra stage section used in Japanese Kabuki theatre. It is a long, raised platform, running through the audience, left of centre to the stage.

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First electric emergency lighting

Around 1930

The **first electric emergency lighting** was used in the 1930s. Initially, national standards regulated the field of emergency lighting, but they were replaced by a European standard in 1979.

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First fire extinguisher

1816

In 1816, the English captain George Manby invented what was perhaps the **first fire extinguisher** as we know it today. However, 100 years earlier there were devices consisting of a wooden barrel filled with water and ignited with the help of black powder and a fuse.

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First audiotape

1909

The **first audiotape** was invented by Franklin C. Goodale. In 1932 it was marketed by the German company BASF (Badische Anilin und Soda Fabrik).

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Woodstock

1969

Woodstock Music and Art Fair was a festival held on a farm in Bethel, New York, USA. The now legendary festival took three days and was massively overrun by an audience of over 400,000, eight times the planned number. Woodstock marks the end of the mainstream hippie movement.

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Lavalier microphone

1932

Lavalier microphones were first used in 1932. They have a small microphone that can be clipped to clothing close to the face of the actor, while the transmitter is hidden somewhere on the body. These microphones allow easy hands-free operation on stage.

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First laser

1960

In 1960 Theodore Maiman developed the **first LASER** (Light Amplification by Stimulated Emission of Radiation). Lasers produce light of a single frequency (colour) in a powerful, narrow beam.

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Gaffer tape

1959

Gaffer tape is a strong, cloth-backed adhesive tape, depeloped by lighting technician and cameraman Ross Lowell in 1959. Its unique selling point is the ability to tear the tape easily by hand despite its thickness. It is now universally used in the theatre, live event, film and broadcast industries.

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Color gels

1877

The **first color gels** (used for colouring light) were invented in 1877 in the US by Brigham. They were originally made of animal gelatin, hence the name , gels‘. In the mid 20th century plastic carrier materials were introduced, giving longer life and fire resistance, but the term , gel‘ is still used.

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Roscolene

1955

In 1955 Rosco introduced its **Roscolene** range of coloured lighting filters, to replace gelatin. Gelatin was flamable and so a fire hazard, and the colours tended to fade. The technically superior Roscolene was made of PVC plastic. More recently, polyester and polycarbonate have been adopted as the substrate for lighting filters.

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First Vari-Lite

1980

The first **Vari-Lite** was created in 1980 by Showco, after an investment of $1m, by the rock band Genesis. Although some remote-controllable and motorised lights existed before, the first Vari-Lite was the ancestor of today's moving head automated lights.

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Spiralift

1988

The **Spiralift** is a lifting system used because of its extreme compactness. Each unit uses two bands of intertwining stainless steel to form a strong and stable column. It is used for orchestra, stage and piano lifts.

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Hologauze

2018

Hologauze is an extremely thin and highly reflective material developed by german company Gerriets. It is used to create 3D projection and hologram effects. Musion is another company creating similar effects, but using a transparent polymer foil rather than a woven gauze.

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Joseph Furttenbach

1591 - 1667

Joseph Furttenbach was a German architect, mathematician, mechanic and chronicler. In his writings, Furttenbach attempted to present the entire architectural and technical knowledge of his time, including theatre technology.

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The Empty Space

1968

The Empty Space is a book by the British director Peter Brook examining four modes or points of view on theatre: Deadly, Holy, Rough and Immediate. The book is based on a series of four lectures and is regarded as one of the most important seminal texts of modern theatre.

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Terence stage

Around 15h century

The **Terence stage** was a stage form of the 15th century, where the plays of the 2nd century BC poet Terence were performed. In the age of humanism, the actors emerged from curtained doors as if from houses, which were in reality only small cells.

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Inigo Jones

1573 - 1652

Inigo Jones was an English architect. He is mostly responsible for discarding the Shakespearean stage by introducing a fixed stage frame, a perspective set enhanced by lighting effects and a rising auditorium with boxes.

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Love Parade Disaster

2010

Because of many errors in planning and the general unsuitability of the site, 21 people died at the **Love Parade** in Duisburg on 24 July 2010. Several hundred more people were injured.

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Asphaleia-System

1880

The **Asphaleia-System** ("Asphaleia" meaning "safety" in greek) was created in Vienna in 1880 as a response to several disasterous theatre fires. The system included multiple technical Innovations to make theatres safer.

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First revolving stage

1617

The first **revolving stage** was created by Tommaso Francini in 1617 at the Palais du Louvre. It can be used for quick scenic transitions or as part of the play itself.

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First gas light

1811

Wilhelm August Lampadius developed the **first gas light** in 1811. It was used in theatres until the introduction of electric light in the late 19th century. Gas allowed the centralised control of lighting through a system of pipes and valves.

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First LED light bulbs

mid 2000s

The first **LED light bulbs** were available on the market in the mid 2000s. They come with the benefits of lower energy consumption, the ability to generate colored light without filters and lower heat generation over ordinary incandescent lamps.

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Harting connector

1956

In 1956, the **Harting** company patented the , Han‘ series of power connectors. They proved reliable and easy to use, and were quickly adopted for multi-circuit lighting cables, as well as other uses. Socapex is a rival product also widely used.

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Fresnel lens

1822

The French physicist Augustin-Jean Fresnel developed the **Fresnel lens** in 1822. Originally intended for lighthouses, the design allows a short focal-length and large aperture without the problems of conventional lenses. It was later adopted for theatre spotlights.

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Magister Ludi

15th century

The **Magister Ludi,** the predecessor of the modern stage manager, directed the play in late medieval theatre. He used the "conducting scroll", a list of what was to happen during the performance.

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Hydraulic machinery

1795

The Englishman Joseph Bramah is considered the inventor of **hydraulic machinery.** In 1795, he developed a hydromechanical machine operated with pressurised water. Later, hydraulic machines were adopted in theatres, to power stage machinery and safety curtains.

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Corral de comedias

Early 16th century

A **Corral de comedias** (literally a "theatre courtyard") is a type of Spanish open-air theatre in the courtyard of a block of houses.

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Neon lighting

1910

The Frenchman Georges Claude first started producing neon as a by-product of the air liquefaction process in 1900. He then demonstrated the first **neon lighting** in 1910 at the Paris Motor Show by showing two lengths of 12 metre long bright red neon tubes.

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First radio communication

1895

Guglielmo Marconi developed the **first radio communication** in 1895 over a distance of about three kilometres. Today, radio communication is used in theatre for wireless microphones, lighting control, and backstage intercomms.

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Magic Lantern

17th century

The **magic lantern** (in Latin: Laterna Magica) is a projection device that was widely used throughout Europe from the 17th to the 20th century. The magic lantern could project painted, printed or photographic images on glass plates.

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First streamed performance

1881

The **first streamed performance** was the Théâtrophone: a telephonic system that allowed users to hear theatre and opera performances at home over telephone lines. It was first demopnstrated in 1881, and commercialised by Compagnie du Théâtrophone in 1890.

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Confidencen

1753

Confidencen is a theatre in the park of Ulriksdal Palace in Solna, just outside the Swedish capital Stockholm. Built in the 1750s by architect Carl Fredrik Adelcrantz and restored in the late 20th century, it is the oldest Rococo theatre in Sweden.

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Chariot system

1641

In 1641 Giacomo Torellis invented the **Chariot system**, to quickly chance scenes. Parallel slots were installed on stage, in which flat, painted wood surfaces mounted on chariots could be moved in and out of sight quickly.

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The mystic gulf

1865

The opera composer Richard Wagner created a theatre in Bayreuth, Germany, to stage his works. A double proscenium and sunken orchestra pit created a space or **, mystic gulf'** between the audience and the stage, drawing the viewer into the fictional world of the opera.

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Bregenzer Festspiele

1946

In 1946 an opera and ballet festival was held on two gravel barges on Lake Constance in Bregenz - one for the stage set, the other for the orchestra. Now **Bregenzer Festspiele** is an international event with a very large floating stage - the Seebühne - and spectacular sets for each production.

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Cloud machine

1920s

The **cloud machine** is a rotating projector that creates the illusion of floating clouds. Images of clouds, painted onto glass slides, were projected onto the cyclorama by a system of lenses and mirrors. It was used in the atmospheric theatre of the late 1920s.

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Fortuny System

1906

Mariano Fortuny invented the **Fortuny System**. The stage was surrounded by a half-dome made of iron and fabric, and an indirect lighting mechanism that included lamps, rotating silk ribbons, mirrors and projection equipment created the impression of a sky. The aim was to to achieve an "en plain air" effect.

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Revox A77

1967

The **Revox A77** reel-to-reel tape recorder was launched by Revox in 1967. It became one of the most sold recorders ever, and was widely adopted by theatres for the recording and playback of sound effects. Because of its sturdy and simple design, many of the recorders are still alive and well today.

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Castle Theatre, Český Krumlov

1766

The **Castle Theatre in Český Krumlov,** Czech Republic, was built between 1765 and 1766 by Joseph Adam zu Schwarzenberg. The building is unique because of its stage machinery to switch backdrops and other scenic elements, which still exist and function today.

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Bourla Theatre, Antwerp

1834

The **Bourla Theatre** (Bourlaschouwburg) is a theatre in Antwerp, Netherlands. It was designed in 1827 by Pierre Bourla, and finished in 1834. The Bourla is the last remaining municipal theatre in Europe with original stage machinery.

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Linnebach projector

1917

The **Linnebach projector** is a lenseless projection system, mainly used to create background images on stage. It was developed by Adolf Linnebach around 1917 and used by a few theatres in the 1920s. The projector comprises a powerful point-source lamp such as an arc light, and a large transparent slide with the image on it.

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Schlaraffia

1859

Schlaraffia is a worldwide German-language association for the cultivation of friendship, art and humour. It was founded in 1859 in Prague by theatre director Franz Thomé, and many theatre technicians became members. The greeting of the Schlaraffen is "Lulu!".

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Josef Svoboda

1920 - 2002

Josef Svoboda was a Czech artist and scenographer. He is one of the most influential scenographers of the 20th century, using new materials and technologies in a holistic approach to peformance design. He pioneered multimedia performances through his Laterna Magika theatre.

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Vitruvius

1st century BC

Marcus **Vitruvius** Pollio was an ancient Roman architect and theorist. His "Ten Books on Architecture" is the only surviving ancient work on architecture and the first Latin work ever to aim at a comprehensive presentation of architecture and also theatre.

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THEATRE TECHNICAL HISTORY

Echea

1st century BC

An **Echea** is a bronze sound vessel, installed in ancient theatres to amplify and acoustically improve singing and instrumental music. The vessels, probably bell-shaped, were placed in the auditorium and had sound slits open towards the audience.

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Glastonbury Festival

1970

The **Glastonbury Festival** of Contemporary Perfoming Arts is a festival for music and performing arts in Glastonbury, UK. Since 1970 it has become one of the biggest open air music festivals in the world.

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Theatre du Soleil

1964

The French theatre collective **"Theatre du Soleil"** was founded in 1964 by Ariane Mnouchkine, Philippe Léotard and others. The cosmopolitan troupe has its main venue in an old munitions factory in Vincennes, Paris. The company creates performances through physical theatre and improvisation.

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Computer-aided design (CAD)

1957

In 1957 Dr. Patrick J. Harmattan introduced the first commercial **CAD** like program called PRONTO. The "computer aided design" helped engineers and designers of all types develop designs more efficiently than on paper. CAD is now widely used in the theatre industry.

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THEATRE TECHNICAL HISTORY

Schaubühne Berlin

1981

The **Schaubühne Berlin** was opened in 1981 in a former 1928 cinema by Erich Mendelsohn. Today it is a multifunctional theatre, the interior space can be flexibly divided and the conventional separation between the fixed audience area and the stage has been abolished.

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THEATRE TECHNICAL HISTORY

Opera Oslo

2008

The new **opera house in Oslo** opended in 2008 and is considered the largest Norwegian cultural project of the post-war period. The building, which is modelled like a floating iceberg, was designed by Snøhetta Architects. It‘s main stage is identical in form, size and structure to the Semperoper in Dresden.

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THEATRE TECHNICAL HISTORY

Gobo

Around 1930

In theatre, a **gobo** is a mask with shapes cut out of it, inserted into a spotlight or projector to display logos, patterns, textures or images. The origin of the term "gobo" is unknown, but may be an shortening of "go-between" from its usage in film production for any object out of shot used to cast a shadow that is seen in shot.

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THEATRE TECHNICAL HISTORY

Frederick Bentham

1911 - 2001

Frederick Bentham was a British technologist and innovator who worked for the lighting company Strand in the UK. He invented the Light Console in the 1930s, which used a cinema organ console to control lighting - a unique and radically different way of controlling light compared to the usual systems of the time.

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THEATRE TECHNICAL HISTORY

Ringtheatre fire

1881

The **Ringtheater fire** occurred on the 8th December 1881 at the Viennese Ringtheater. Because a gas lamp exploded, the theatre burned down and more then 400 people died in the fire. Afterwards safety curtains were made mandatory.

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THEATRE TECHNICAL HISTORY

Max Keller

1975 - today

Max Keller is a Swiss-German lighting designer, and has worked all over the world. He has been highly influential in promoting the role of the lighting designer as a creative theatre artist, through his work and publications.

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THEATRE TECHNICAL HISTORY

Argand lamp

1780

The **Argand lamp** was a type of oil lamp invented by Aimé Argand. A cylindrical wick and a glass chimney increased the air-flow and steadied the flame. The Argand lamp was therefore much brighter then earlier types, and needed the wick trimming less often, making it well suited for use in theatres.

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THEATRE TECHNICAL HISTORY

Thunder sheet

Around 1700

A **thunder sheet** is a large, thin sheet of metal that is shaken to produce the sound of thunder for a play. Dramatist John Dennis is credited with the first use of thunder sheets for his tragedy Appius and Virginia. His invention was stolen by another theatre production, gaving rise to the phrase, "stole my thunder".

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THEATRE TECHNICAL HISTORY

Edward Gordon Craig

1872 - 1966

Edward Gordon Craig was a modernist British actor, director and stage designer. During his lifetime he was mostly unable to realise his radically modern theatre concepts and his abstract stage aesthetics based on light and shadow. However, his ideas had a significant impact through his published work, drawings and woodcuts.

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THEATRE TECHNICAL HISTORY

Max Littmann

1862 - 1931

Max Littmann was a German architect, who reformed the design of theatres to be more suited to the general public rather than the court or aristocracy. He created auditoriums in the form of the amphitheatre, reducing or omitting the boxes to give all theatre-goers a good view of the stage.

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THEATRE TECHNICAL HISTORY

Gottfried Semper

1803 - 1879

Gottfried Semper was a German architect, art critic and professor who designed and built the Semper Opera House in Dresden between 1838 and 1841. His unrealised design for an opera house in Munich was, without permission, adapted by Wagner for the Bayreuth Festspielhaus.

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THEATRE TECHNICAL HISTORY

Carl Lautenschläger

1843 – 1906

The theatre engineer **Carl Lautenschläger** was a student of Carl Brandt. He electrified the lighting and machinery of several theatres and is the , father' of Europe's first revolving stage, which he set up in 1896 at the Munich Residenztheater where he was Royal Bavarian Court Theatre Machinist.

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THEATRE TECHNICAL HISTORY

Festspielhaus Bayreuth

1872-75

The **Festspielhaus Bayreuth** in Germany was built by architect Otto Brückwald to the designs of Richard Wagner, to stage his operas. The steeply rising amphitheatre seating, recessed orchestra pit and darkened auditorium were techniques to create an individual, transcendent experience for the spectator.

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THEATRE TECHNICAL HISTORY

Prague Quadrennial

1967

The **Prague Quadrennial** of Performance Design and Space was established to celebrate and promote design for performance, scenography, and theatre architecture. Today it is a vibrant meeting point for professionals, students, academics and the public with a shared interest in performance design and architecture.

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The Ordinary

1580s

In the late 16th century in England, **the Ordinary** kept a play script and prompted the actors performing their parts, speaking quietly in their ears. The Ordinary was so called because he kept order during the performance - one of the first stage managers.

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The Voice of the Theatre

1945

The **Voice of the Theatre** loudspeaker systems were made by Altec Lansing from 1945. Designed for cinemas, they were later adopted by theatres and for live music – including at Woodstock. They brought a great improvement in both loudness and sound quality, making the most of the low-powered amplifiers of the time.

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THEATRE TECHNICAL HISTORY

Cart Machine

1959

The **cart machine** was an audio playback device. Designed for radio jingles, each cartridge, or cart, held a loop of recording tape which the machine played on cue. In theatre carts were used for playing back sound effects, with the carts swapped in and out of the machine as required.

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THEATRE TECHNICAL HISTORY

Oskar Schlemmer

1888 - 1943

Oskar Schlemmer was a German painter and scenographer, and a director of the Bauhausbühne. He was concerned with the relationship between the figure and space, and developed an avant-garde dance, the Triadic Ballet.

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THEATRE TECHNICAL HISTORY

Triadic Ballet

1922

The **Triadic Ballet** was an experimental ballet developed by Oskar Schlemmer in Stuttgart from 1912, and first performed in 1922. The ballet incorporated revolutionary avant-garde conceptual and aesthetic ideas.

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THEATRE TECHNICAL HISTORY

Robert Lepage

1957 - today

Robert Lepage is a Canadian playwright, actor, film and stage director. He is internationally known for his creative, idiosyncratic approach to theatre, but most of all the conscious use of new technologies as an integral part of his performance-making.

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THEATRE TECHNICAL HISTORY

La Scala

1778

The Teatro alla Scala in Milan was built between 1776 and 1778 by Italian architect Giuseppe Piermarini. Known simply as **La Scala**, it is regarded as one of the leading opera and ballet theatres globally.

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THEATRE TECHNICAL HISTORY

Opera Garnier

1875

The **Opera Garnier** in Paris was built between 1860 and 1875 by Charles Garnier at the behest of Napoleon III. It is one of the most decorated and opulent opera houses ever built. The Opera Garnier is the setting for the book, "The Phantom of the Opera", and its various stage and film adaptions.

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THEATRE TECHNICAL HISTORY

Condenser Microphone

1916

The **condenser microphone** was invented at Western Electric in 1916 by E. C. Wente. A moving diaphragm and a static plate act as a condenser (now called a capacitor), and the changing capacitance converts sound vibrations into an electrical signal.

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THEATRE TECHNICAL HISTORY

Ribbon Microphone

1920s

Walter H. Schottky and Erwin Gerlach co-invented the **ribbon microphone**. In this type of microphone, sound waves vibrate a thin sheet of electrically conductive material placed between the poles of a magnet, which then produces an electrical signal by electromagnetic induction.

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THEATRE TECHNICAL HISTORY

Richard Pilbrow

1933 – today

Richard Pilbrow is a British stage lighting designer and theatre design consultant. He has been a major influence on the development of lighting design and technical theatre in the UK, the USA and internationally.

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THEATRE TECHNICAL HISTORY

Eiduphusikon

1781

The **Eiduphusikon** was a large-scale miniature theatre designed to create the illusion of living nature, devised by the English actor David Garrick and the French painter Philip James de Loutherbourg. Model land- and cityscapes were animated with lighting, music and sound effects to create sunrises, moonlight, storms and volcanos.

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THEATRE TECHNICAL HISTORY

Alexander von Salzmann

1874 - 1934

Alexander von Salzmann was a painter and scenographer born in Tiflis, Georgia, and is associated with the "Blauer Reiter" art-movement. He worked with Adolphe Appia and Émile Jaques-Dalcroze, creating the lighting system at the Festspielhaus in Hellerau, Dresden.

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THEATRE TECHNICAL HISTORY

National Theatre, London

1976

The **National Theatre in London** opened in 1976 and was designed by Denys Lasdun. It has three stages: the amphitheatre Olivier, the proscenium arch Lyttleton, and the flexible Dorfman. The building is noted for its polarising brutalist architecture.

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THEATRE TECHNICAL HISTORY

Loïe Fuller

1862 - 1928

Loïe Fuller was an American actress and dancer who was a pioneer of both modern dance and theatrical lighting techniques. She developed the serpentine dance, a dance used to created figures and images on stage through the use of fabrics and lighting.

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THEATRE TECHNICAL HISTORY

Sebastiano Serlio

1475 - 1554

Sebastiano Serlio was an Italian architect and architectural theorist. His influential treatise Seven Books on Architecture contains designs for three theatrical scenes (comic, tragic, and satirical) as well as a stage plan and cross section. His ideas for staging were widely adopted in Renaissance theatres.

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Gran Teatre del Liceu

1847

The **Gran Teatre del Liceu** by architect Miquel Garriga i Roca is the largest opera house in the Catalan capital Barcelona and is located on the Rambles in the centre of the city. The opera and concert house was reopened in 1999 after a fire in 1994.

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THEATRE TECHNICAL HISTORY

Cobbler‘s ball

15th century

The **cobbler‘s ball** or cobbler‘s lamp is a glass ball filled with water which acts as a lens to focus the light of a candle. It was used wherever a brighter, more concetrated light source was required.