

Top
Ground Plan
of the Cologne
Opera House

NEW
DEVELOPMENTS.

by
Walther Unruh

... IN THEATRE BUILDING AND TECHNICAL STAGE EQUIPMENT

THE classic type of Italian opera house was developed during the period of the Renaissance in the seventeenth century and perfected during the age of the great baroque designers, among whom Galli-Bibiena was pre-eminent. A number of factors guided the evolution of this theatre: the necessity of designing a specialised building for theatrical productions, to replace the former festival hall in a royal court building which had been fitted out very simply with provisions for an occasional theatrical event; the desire to present a great variety of scenes in rapid succession; and the new technique of painting realistically in perspective.

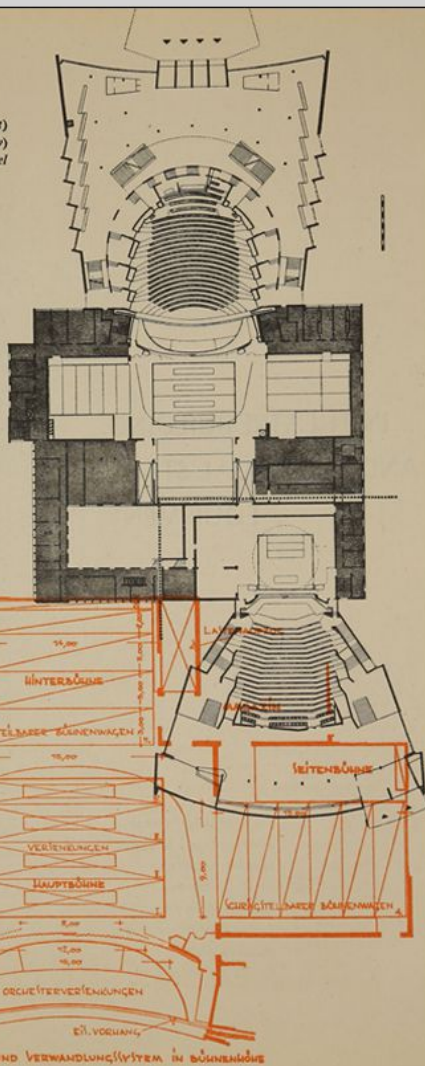
The Italian theatre was characterised particularly by the importance of the proscenium frame. Behind this frame the stage area was divided in depth into several sections, one behind the other. These so-called 'streets' were each fitted with a pair of movable painted wings at either side. There were pipes above each street for drops or hangers, and trap doors in the stage floor made possible the apparition of devils and other *dei ex machina* from below. The system included a floor beneath the stage and a grid in the high stage tower. Flat sets, painted on canvas and on framed pieces, were normally employed.

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The Italian or so-called 'classic' type of scenery is still used today throughout most of the Romance countries—Italy, France, Spain and even South America. Painted on linen drops or at times on paper, this scenery stores easily and transports handily on tour. It is useful for realising a naturalistic setting which is to be rather dimly

The Ground Plan (right)
and Stage System (below)
of the Theatre at Kassel



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lighted and viewed from a considerable distance.

But this kind of scenery does not adapt itself to the ideas and techniques of the modern stage designer and director. It is also dangerous, in the sense that it is highly inflammable. And it was indeed the great fire of the Ring Theatre of Vienna in 1881 which led to a reformation of the theatre equipment backstage.

Today the old wooden constructions have vanished, replaced with iron-work and electrically operated machinery. With the perfecting of elevators, three-dimensional staging developed, and at the same time stage lighting was revolutionised by a very important invention—electricity. The old gas lights were replaced by electric lamps of various specialised kinds, which provided more intensity of light in a variety of colours and could easily be dimmed or switched.

Plastic Scenery

As a result of these technical developments painted settings disappeared in Middle Europe to be replaced by plastic scenery created in the aesthetic styles of our century. The new scenery was not more naturalistic, but rather more symbolistic. Plastic sets, however, cannot be hung up or stacked one against the other as quickly as flat pieces. In addition, they must be mounted before the beginning of the performance or scene in which they are to be used. Thus a wide stage area is required around the main stage, on both sides as well as at the back.

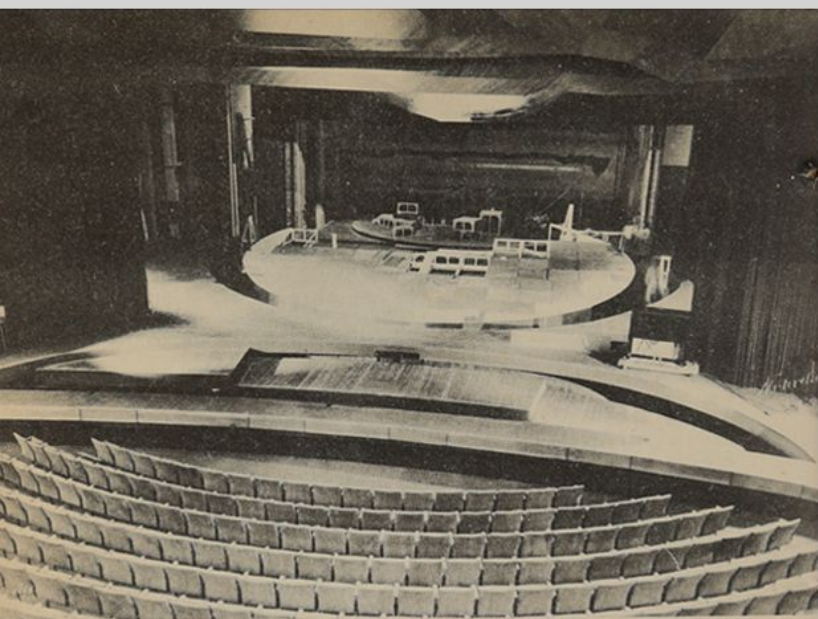
So-called 'stage wagons' were invented, on which sets can easily be 'prefabricated'. These wagons are then pushed

onto the main stage by hand or drawn on by electric machinery when the scenery is wanted for the performance. This method of handling scenery is not only simple and efficient, but also economical, since the stage hands can set up and strike sets on the side stages behind sound-proof curtains, either during an actual performance or during a rehearsal taking place on the main stage.

The Cologne Opera House

The new Opera House of Cologne in Germany, a theatre seating 1,500 which was constructed in 1953, illustrates a particularly practical use of this modern stage system. The ground plan, as shown in the illustration, contains two side stages and a back stage connecting with additional storage space. The main stage is fitted with elevators. These elevators, running the width of the stage, can be raised or lowered to step sections of the stage or the entire stage up or down; thus, chorus, ballet or supers can easily be arranged at different levels. The elevators are operated by electric power.

Theatres designed for operettas or spoken drama do not normally require such elaborate equipment, since the acting space desired is usually not as large as that required in opera production. These theatres, however, often use a revolving stage or revolving table. In this case various sets are mounted on pie-like slices of the circular stage, and the sets appear within the stage frame, as required, when the stage table is revolved by electrical machinery. The device was used even in the Greek and Japanese theatres. What is new is the movement of the table during



Stage and Orchestra Pit of the Kassel Theatre

the action of the play. For example, a house may be shown from the outside in one set and from the inside in an adjoining set. The actors can now walk 'backstage' through the front door and immediately enter the new inside set as it is appearing within the stage frame. In this way the turntable is given a dramatic function.

Another characteristic of the new theatre, whether operatic or dramatic, is the attempt to avoid a distinct separation of action and audience by means of the proscenium frame. In the classic Italian theatre the audience viewed the performance as though through a peephole. Modern audiences find it more

exciting to be, so to speak, within the acting area, and modern designers make possible an optical and physical connection between the stage and the auditorium.

This is not hard to achieve, except for the fact that most countries have a building code which requires a fire-proof 'iron curtain' or 'asbestos curtain' separating the audience from the stage area. For large theatres such an emergency protection of the public against fire and panic is almost a necessity. The standard arrangement of this curtain cuts the whole theatre into two parts. But this inconvenience can be avoided to some extent by utilising

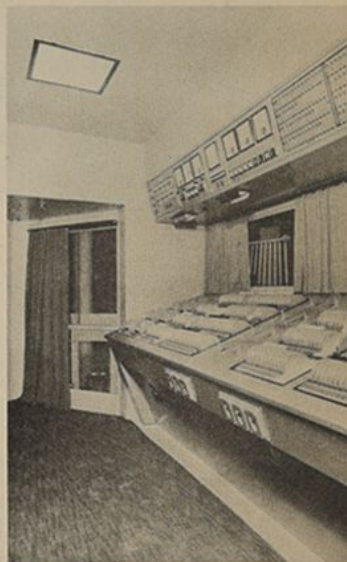
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a solution like that of the new dramatic theatre in Bochum. Here the asbestos curtain is designed as a cylindrically curved plane situated between the first pair of orchestra seats and the orchestra pit or forestage area. The proscenium is behind the curtain. A practical optical connection between auditorium walls and stage is possible because the forestage apron can be set and lighted for dramatic productions, or lowered to form an orchestra pit for operas. The forestage elevators make possible five different arrangements of this area directly behind the fire curtain, as shown in the illustration.

From Central to Axial Design

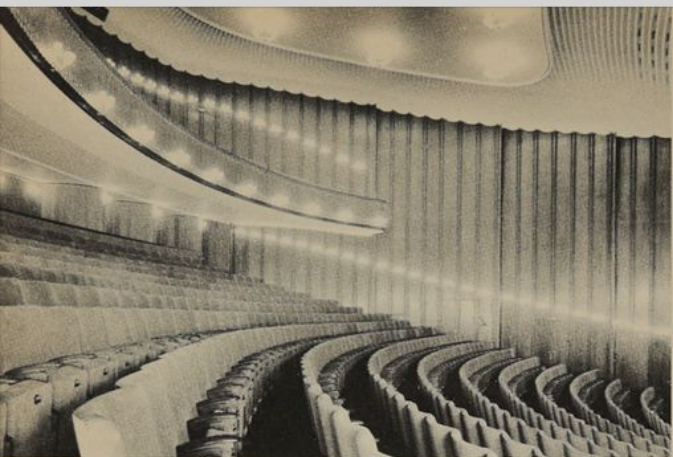
It is evident that this type of variable proscenium is much more useful for modern staging than the so-called arena design. After all, an actor or a singer has a face on only one side of his body. Effective as pantomime is, emotion is conveyed primarily by the face. Therefore when the protagonist appeared in the antique Greek plays, theatre design changed from the central type to the axial type. Only in the axial design can the actor be seen most effectively.

Arena theatres have been used successfully for big chorus performances in the antique style, and for intimate discussion-like performances for a small audience which in a sense participates in the play, as in *Our Town* by Thornton Wilder. Generally speaking, however, even ballet benefits from a scenic background and must face the audience. For these reasons arena design will not dominate the theatre of the future, although this type of building



A modern stage lighting control board fitted behind the orchestra seats





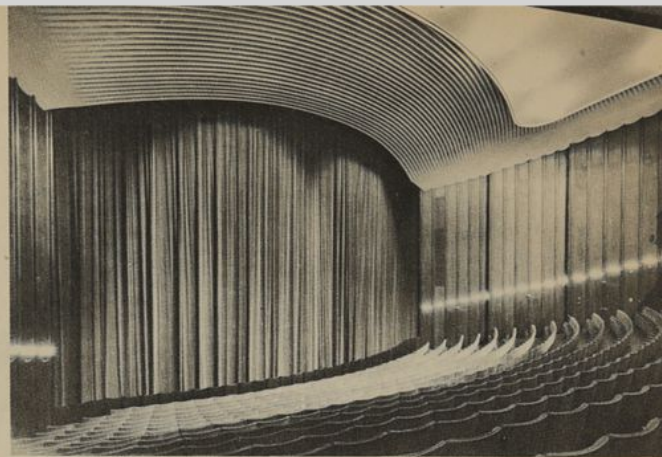
A view of the Auditorium of the Dramatic Theatre, Bochum

will always be interesting for special productions.

Complicated stage machinery has more and more lost significance in the modern theatre. Only a few years ago it seemed almost a miracle when an actor appeared on stage suddenly with the aid of traps or flying machinery. Today television and movies offer much more amazing feats, and in every modern building the spectator rides up and down in elevators day after day. His imagination must be surprised in a new way. The answer, as it has turned out, lies in unusual lighting effects. Today stage machinery is rarely used to create dramatic effects. It now serves the more practical purpose of accomplishing rapid changes of plastic scenery with greater economy than before and with less physical exertion on the part of the stagehands.

In place of the enormous machinery of the past, today's stage must possess lighting equipment of great complication and flexibility. The generalised floodlight of the 'borders' with a three or four colour system is now supplemented by many different types of spots and projectors. These are mounted on light bridges and fly galleries, they hang from the grid or are suspended on so-called 'ladders'; they stand on the stage floor; they peer from the side walls of the auditorium and are hidden behind the balcony or even buried in the breastwork. These various specialised lights can be precisely controlled to give an exactly limited beam which, when desired, follows the actor, and colour changes are accomplished by means of filters.

With the invention of a new type of bulb, the Xenon lamp, projection



Another view of the Auditorium of the Dramatic Theatre, Bochum

machines are gaining increasing favour. This lamp makes it possible to project slides or film with consistent colour control, whether the light is at full intensity or greatly dimmed. The cyclorama, devised originally to help create the illusion of a stage sky, has now come into its own as a good infinite background on which entire sets can be projected to wrap actors and audience in a stage illusion much as the Cinorama or Cinemascope screens serve motion pictures. Cycloramas are made of canvas painted white or light blue. They hang freely from a curved track in the grid, and when not needed they can be rolled up on one side of the stage, like a window shade standing on end, by a motor-operated winch. The operation takes less than a minute. Special cyclorama lights fitted with fluorescent or Xenon

lamps can produce an illusion of the sky, in varying intensities and in different shades ranging from dark blue to light azure.

The stage lighting set-up in large modern theatres normally incorporates from 100 to 300 circuits. These are controlled from a central board and switched and dimmed by a variety of systems utilising either dimmers or rheostats, electronic tubes known as thyatrons, magnetic amplifiers or transducers, or silicon reactors called transistors. The over-all effect of these different systems is the same; individual lights or a light group can be raised in intensity from zero to 100 degrees and can be switched slowly or rapidly, either individually or all together. In the end, of course, the artistic effect depends entirely upon the cleverness of the master electrician and





Front view of the Bochum Dramatic Theatre (Architect G. Graubner)



The Stage-manager's Desk

Backstage of the Kassel Theatre

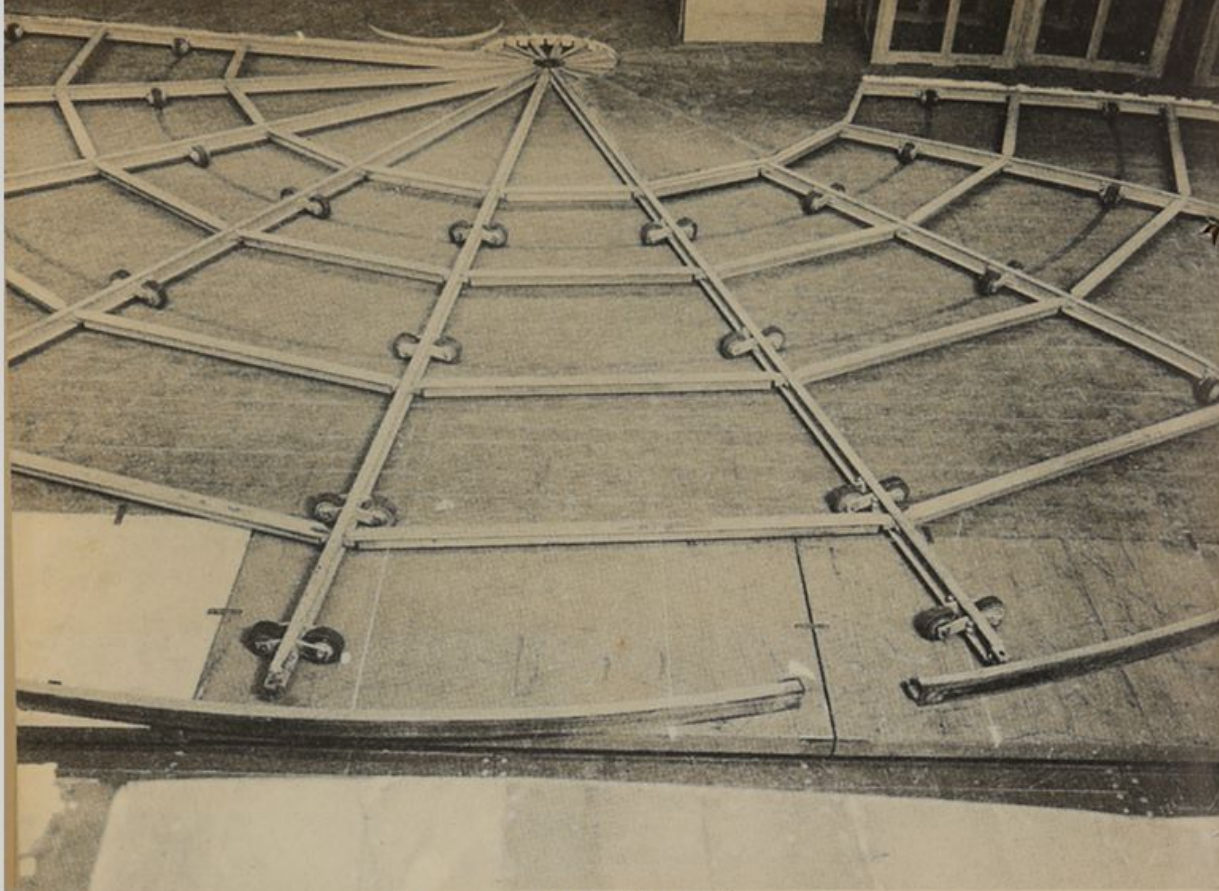


the good taste of the producer.

While the design of different lighting control systems varies greatly, in general one can say that one gets what one pays for, and the more expensive the system the better it is likely to be. The most sophisticated system developed up to this point uses electronic presets and a punched card system for initiating cues. This type of system is evidently economical and practical only for shows which can count on a long run of the same production. Smaller theatres still find no substitute for a master electrician who can paint the scenery from moment to moment by hand-control of each lighting cue.

Sound equipment is another normal part of modern stage equipment. Electronic sound, whether it originates from microphones, pre-recorded tapes or records, is highly effective for noises like wind, thunderstorms, rain, etc. It is also useful for backstage music, for the murmuring of crowds, for bells, and the cries of animals. Electronic music can add greatly to the control of audience reactions and emotions during a dramatic presentation.

It has been said that the complicated and virtuoso equipment of the modern stage can overwhelm the artistic content of an opera or a dramatic



The construction of a portable turntable

performance. This is a misguided idea. In every period of theatre history the most modern devices of the contemporary theatre have been employed for theatrical effect. It is the business of the theatre technician to make such equipment available. From that point on it is the responsibility of the producer or director

to make use of the equipment to produce an artistic effect. In the end, no theatre equipment, however elaborate, can provide imagination and good taste where it is lacking; but when the best modern equipment is in the hands of an inspired producer he can create artistic effects which would otherwise be impossible.

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