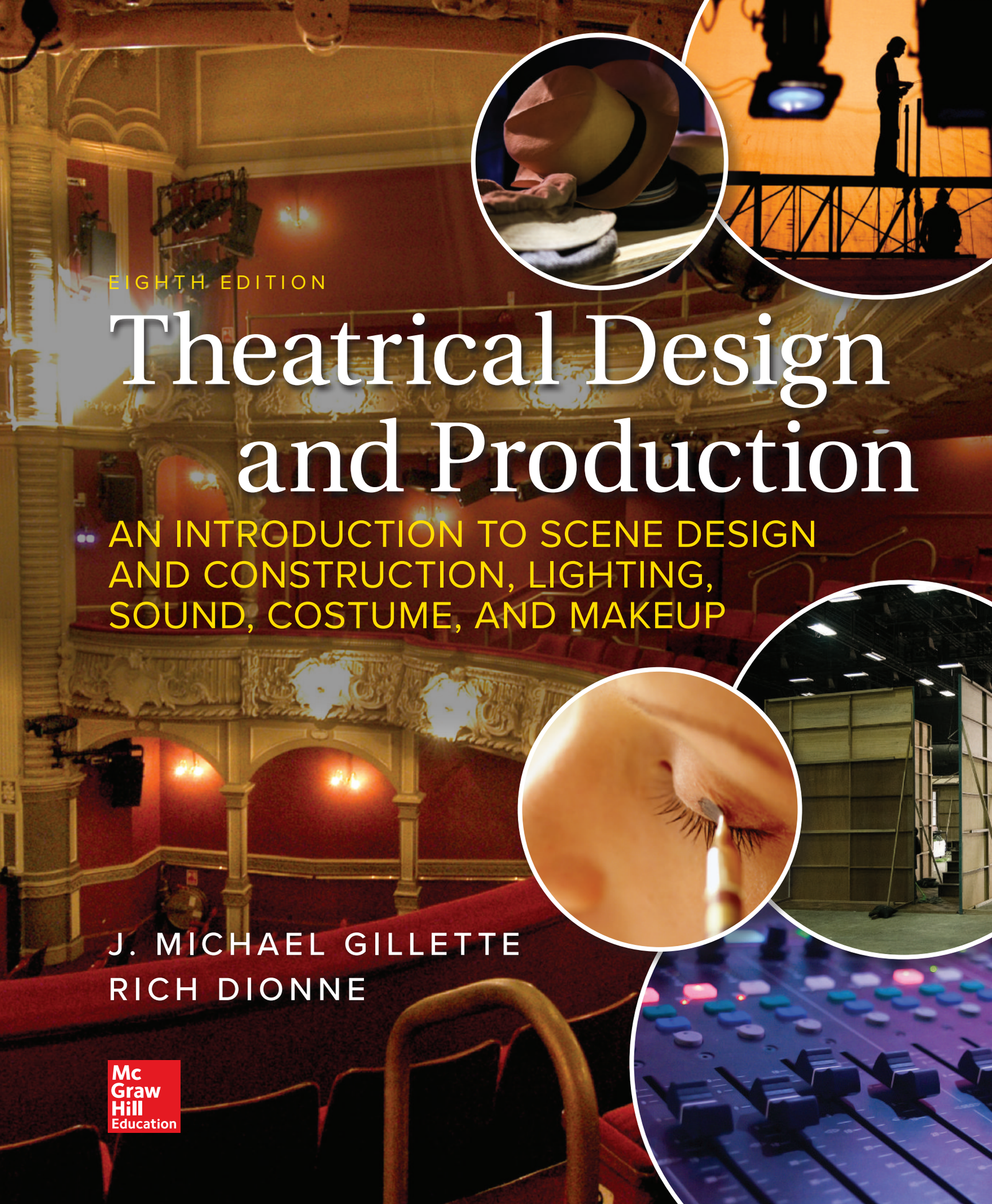


EIGHTH EDITION

Theatrical Design and Production

AN INTRODUCTION TO SCENE DESIGN AND CONSTRUCTION, LIGHTING, SOUND, COSTUME, AND MAKEUP

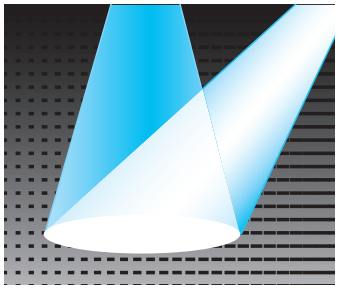
J. MICHAEL GILLETTE
RICH DIONNE

Mc Graw Hill Education

Theatrical Design and Production

Theatrical Design and Production

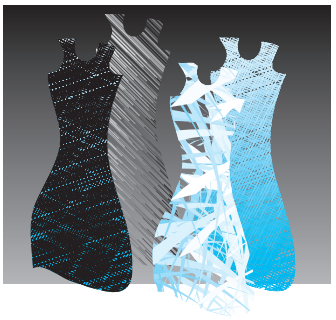
An Introduction to Scenic Design and Construction, Lighting, Sound, Costume, and Makeup



EIGHTH EDITION

J. Michael Gillette
University of Arizona

Rich Dionne
Purdue University



Mc Graw Hill Education

THEATRICAL DESIGN AND PRODUCTION: AN INTRODUCTION TO SCENIC DESIGN AND CONSTRUCTION, LIGHTING, SOUND, COSTUME, AND MAKEUP, EIGHTH EDITION

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 LWI 21 20 19

ISBN 978-1-259-92230-5 (bound edition)
MHID 1-259-92230-8 (bound edition)
ISBN 978-1-260-68746-0 (loose-leaf edition)
MHID 1-260-68746-5 (loose-leaf edition)

Product Developer: *Alexander Preiss*
Marketing Manager: *Nancy Baudean*
Content Project Managers: *Lisa Bruflodt, Danielle Clement*
Buyer: *Susan K. Culbertson*
Designer: *Egzon Shaqiri*
Content Licensing Specialist: *Ann Marie Janette*
Cover Image: *©numb/Alamy; ©Shutterstock/Anna Jurkovska; ©Pixtal/AGE Fotostock; ©Shutterstock/Niphon Subsri; ©Shutterstock/Nicole S Glass; ©Shutterstock/EBZphotography*
Compositor: *Cenveo® Publisher Services*

Library of Congress Cataloging-in-Publication Data

Names: Gillette, J. Michael, author. | Dionne, Rich, author.
Title: Theatrical design and production : an introduction to scenic design and construction, lighting, sound, costume, and makeup / J. Michael Gillette, Rich Dionne.
Description: Eighth edition. | New York, NY : McGraw-Hill, a business unit of The McGraw-Hill Companies, Inc., [2020] | Includes index.
Identifiers: LCCN 2018042904 (print) | LCCN 2018055338 (ebook) | ISBN 9781260687507 (ebook) | ISBN 9781259922305 | ISBN 9781259922305(alk. paper) | ISBN 1259922308(alk. paper)
Subjects: LCSH: Stage management. | Theater—Production and direction. | Theaters—Stage-setting and scenery.
Classification: LCC PN2085 (ebook) | LCC PN2085 .G5 2020 (print) | DDC 792.02/5—dc23
LC record available at https://lccn.loc.gov/2018042904

mheducation.com/highered

Preface

First courses in the world of theatrical design and production, like the art they introduce, come in a bewildering array of shapes, sizes, textures, and colors. Some students receive their introduction to this subject area in a general overview course that covers the design and production elements of scenery, costumes, lighting, and sound in a single semester. Other students may enjoy the luxury of an entire year in which to discuss the same material. Still others may take individual courses that specialize in the theory and craft of the separate areas that comprise the field of theatrical design and technical production. The course content is very flexible indeed.

To create a text that will serve the needs of all these courses is a distinct challenge. I've tried to rise to that challenge by organizing the material in two ways. The chapters appear in a logical sequence, but each chapter is also an island of information that can stand alone. My hope is that this organization will enable each instructor to pick and choose the type and amount of material that is appropriate for his or her particular course. This type of organization also makes the text a useful reference for students to keep throughout their design and technical production careers.

Organization and Content

Just as a play wouldn't start without the scenery being in place, this book doesn't delve into technical procedures without first setting the stage. Chapters 1 through 4, "Production Organization and Management," "The Design Process," "A Brief History of Theatre Architecture and Stage Technology," and "The Stage and Its Equipment," provide a grounding in real-world issues and are appropriate for use in almost any type of technical production class.

Of special significance is Chapter 2, "The Design Process." It contains material that, prior to the first edition of this book, had not been included in beginning technical theatre texts. It is a problem-solving and conceptual-thinking model created specifically for theatrical practice. Its purpose is to increase each student's creative capacity by reducing the effects of two prime ingredients of creative dysfunction—fear and frustration. The mechanism used to effect this change is a seven-step procedure that enables students to make logical, rational, and considered decisions when making the myriad choices involved in creating a design or solving a technical challenge in any area of theatrical production.

Chapter 3, "A Brief History of Theatre Architecture and Stage Technology," provides a concise chronology, both pictorially and textually, of the history of theatre architecture. I've included this information for two reasons: the functional design of the environment in which a play is produced has always been a major factor in determining the type, style, and design of technical elements used in a production, and all too frequently student designers are not required to take courses in theatre history.

Chapters 7 and 8, "Mechanical Drafting" and "Perspective Drawing," contain specific how-to information on the drafting and mechanical perspective techniques most commonly used in theatrical production. These chapters appear here because it may be helpful for students to learn the grammar of graphic language before they encounter these types of drawings in the scenic and lighting design chapters. Chapter 7, "Mechanical Drafting," provides information about the types of drafting used in

the theatre, helpful hints on the process of drafting as well as extensive material on CAD drafting. Chapter 8, "Perspective Drawing," offers a step-by-step procedure, with exercises, for creating accurate scale mechanical perspective drawings.

Chapter 15, "Electrical Theory and Practice," provides a concise explanation of the nature and function of electricity and electronics and the practical use of the power formula, as well as information on wiring practices and standards.

Chapter 22, "Drawing and Rendering," provides an overview of the types of paints, pastels, markers, and papers commonly used in theatrical rendering, as well as information on basic application techniques used with these media.

The remainder of the text provides an overview of the function and responsibilities of the scenic, lighting, costume, and sound designers. It also contains primary information about the tools and basic techniques that are used to bring each designer's concepts to the stage.

As with any art form, the basic element necessary for creating a successful design in theatre is an understanding of design principles and chosen medium. I hope that this text not only provides those basics but also offers encouragement and inspiration to create.

Features

In many ways, *Theatrical Design and Production* is a traditional introductory text for the various design and craft areas of theatrical production. With a number of features, however, I strive to set this text apart.

Philosophy The underlying spirit of this text is firmly rooted in my belief that learning and creating in the various fields of theatrical design and production can be, and should be, fun. With that thought in mind, I've tried to make this text not only informative and practical but also motivating and inspirational.

Color Analysis The sixteen-page color analysis section presents a discussion of the practical applications of color theory by analyzing the interactive effects of the color selections for the scenery, costumes, and lighting for two productions — one with a very narrow, muted palette and the other with a full-spectrum, heavily saturated color style.

Safety Tips Safety tips are discussed throughout the text. They have been placed in special boxes adjacent to the relevant text to help readers integrate learning about a tool, material, or process with its safe use.

Running Glossary To help students learn and remember the vocabulary of the theatre, new terms are defined in the margin on the page where they first appear.

Production Insights Placed throughout the text, these boxes identify material that provides further depth and practical information to the discussion.

Design Inspiration Similar to the "Production Insights" boxes, but located only in design chapters, these include material that will enhance student understanding by providing insights and solutions to real theatrical problems.

Illustration Program An extensive photo and illustration program provides a very strong adjunct to the textual information. Photos from professional theatre productions are used to provide a model that students can strive to emulate.

New to the Eighth Edition

The eighth edition of *Theatrical Design and Production* has been extensively revised. Every chapter has had minor — and in some cases major — revisions to bring the information it offers in line with current standards and practices.

Chapter 5, "Style, Composition and Design," has been updated with several new pictures and revised text to better explain the concepts involved.

Chapter 7, "Mechanical Drafting," has been extensively revised to reflect current practice. The ubiquity of CAD drafting has almost completely replaced the use of hand-drafting shop plates and light plots. The material on hand drafting has been moved to a separate appendix, and the bulk of the chapter is now devoted to an explanation of CAD drafting.

Chapter 8, "Perspective Drawing," has also been extensively revised to, hopefully, make the guidance for how to mechanically draw in perspective a little more understandable.

Chapter 9, "Scene Design," has been updated with new material on model making and several new photos.

Chapters 10, "Tools and Materials," and 11, "Scenic Production Materials," have both been extensively revised. Technological changes have been myriad since the last edition, many of which have caused revision in both design and production practices. One of the most prominent is the introduction of CNC machining to many phases of both construction and design. The ability of 3-D printers to produce parts has been applied to both scenery and property shops as well as to the construction of the designer's models.

Chapter 16, "Lighting Production," has been revised to reflect that LED lamp sources are now becoming much more common in stage lighting and are demonstrated in the new fixtures illustrated and explained in the chapter.

Chapter 21, "Sound Design and Technology," has been extensively revised to make the material more accessible to the reader. New equipment is also introduced and explained.

It is my pleasure to welcome Rich Dionne as co-author for this eighth edition of *Theatrical Design and Production*. Rich is the Technical Director and Production Manager in the Department of Theatre at the Patti and Rusty Rueff School of Visual and Performing Arts at Purdue University and brings to our book a wealth of knowledge about the tools, techniques, and practices of technical theatre. He's a practicing professional and an educator, and he's well-versed in the art and craft of all areas of theatrical production. He's a welcome addition. His work has been invaluable, and I want to publicly thank him for becoming a member of the team.

The updating for this edition could not have been accomplished without the information, ideas, and counsel provided by the practicing professionals/educators in their respective fields: Rich Dionne (technical theatre), Michael McNamara (lighting), Charlie Calvert (scene design), and Heath Hansum (sound). Their knowledge, information, and assistance have been invaluable in making this edition current in the areas of design, technology, materials, and practice. It's exciting to think about the new developments on the horizon for theatrical design and what the future will bring. The theatre truly is an interesting and fun place to be.

J. Michael Gillette

Being asked to come on board as co-author for this textbook has been incredibly overwhelming and humbling. I can still picture in my mind the cover for the third edition of this book, which came out when I was just starting graduate school (the first time!). This book was my introduction to theatre production as an undergraduate student, and it opened my eyes to the breadth and depth of knowledge, techniques, methods, and materials that make up this craft we call theatre. I remember my excitement at the time, seeing how vast the career — calling — I was entering could be. It's a true honor to be a part of similarly inspiring readers today, some twenty years later.

Theatre somehow has always managed to borrow the best of what other industries do, and as costs go down and technology advances, the way we make theatre

continues to change and expand. Theatres and production shops now use CNC machining; CAD dominates the field; computer networks drive communication for lighting, sound, and video systems — all huge leaps forward from what was common in theatre production even ten or fifteen years ago. Keeping up with these advances is a challenge, but one that I'm excited to help this book rise to meet in this and future editions. I'm grateful to Michael for asking me to be a part of it.

Rich Dionne

Finally, we would like to thank those friends and colleagues who have offered suggestions for improving *Theatrical Design and Production.* In particular, we would like to thank the following reviewers for their help in preparing the eighth edition of this text.

Bruce B. Brown, University of the Ozarks
Benjamin Ray Mays, UvaWise
Phoebe Hall, Fayetteville State University
Scott Grabau, Irvine Valley College
Brian Begley, Wayne State College
David M. Makuch, Marietta College
Greg McLarty, Wharton County Junior College
David Lee Cuthbert, University of California Santa Cruz

Mc Graw Hill Education connect®

Students—study more efficiently, retain more and achieve better outcomes. Instructors—focus on what you love—teaching.

SUCCESSFUL SEMESTERS INCLUDE CONNECT

FOR INSTRUCTORS

You're in the driver's seat.

Want to build your own course? No problem. Prefer to use our turnkey, prebuilt course? Easy. Want to make changes throughout the semester? Sure. And you'll save time with Connect's auto-grading too.

65%

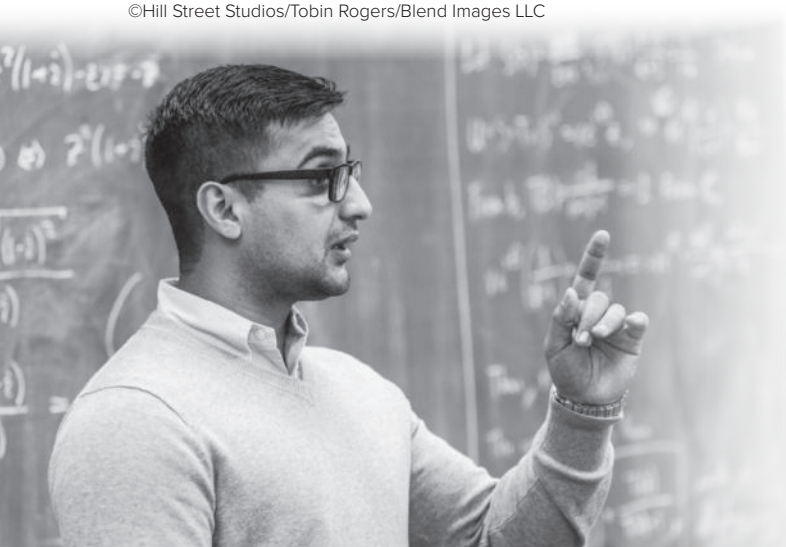
Less Time Grading

They'll thank you for it.

Adaptive study resources like SmartBook® help your students be better prepared in less time. You can transform your class time from dull definitions to dynamic debates. Hear from your peers about the benefits of Connect at **www.mheducation.com/highered/connect**

Make it simple, make it affordable.

Connect makes it easy with seamless integration using any of the major Learning Management Systems—Blackboard®, Canvas, and D2L, among others—to let you organize your course in one convenient location. Give your students access to digital materials at a discount with our inclusive access program. Ask your McGraw-Hill representative for more information.



Solutions for your challenges.

A product isn't a solution. Real solutions are affordable, reliable, and come with training and ongoing support when you need it and how you want it. Our Customer Experience Group can also help you troubleshoot tech problems—although Connect's 99% uptime means you might not need to call them. See for yourself at **status.mheducation.com**

For Students

Effective, efficient studying.

Connect helps you be more productive with your study time and get better grades using tools like SmartBook, which highlights key concepts and creates a personalized study plan. Connect sets you up for success, so you walk into class with confidence and walk out with better grades.

> "I really liked this app—it made it easy to study when you don't have your textbook in front of you."

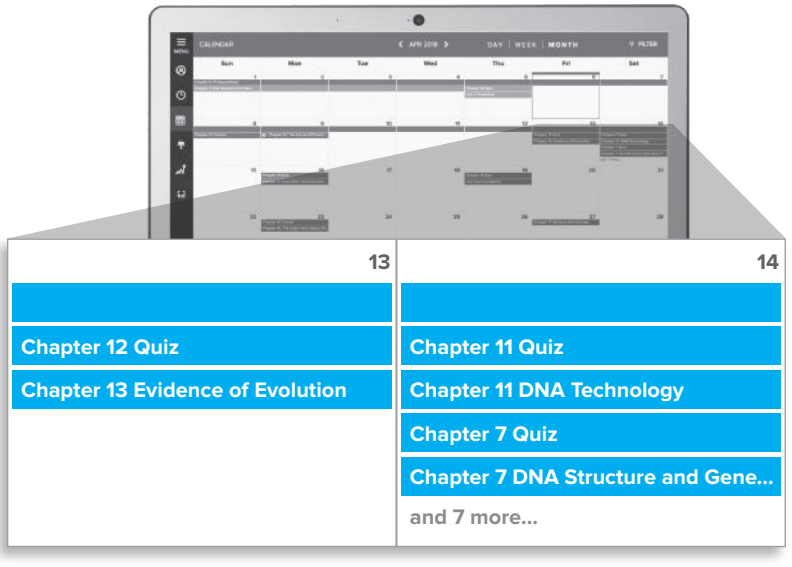
- Jordan Cunningham,
Eastern Washington University

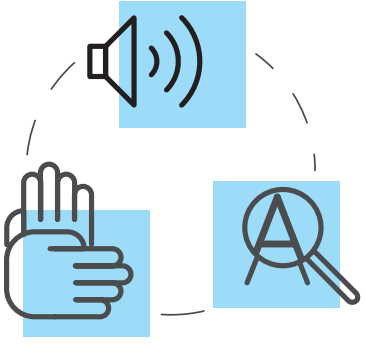
Study anytime, anywhere.

Download the free ReadAnywhere app and access your online eBook when it's convenient, even if you're offline. And since the app automatically syncs with your eBook in Connect, all of your notes are available every time you open it. Find out more at **www.mheducation.com/readanywhere**

No surprises.

The Connect Calendar and Reports tools keep you on track with the work you need to get done and your assignment scores. Life gets busy; Connect tools help you keep learning through it all.





Learning for everyone.

McGraw-Hill works directly with Accessibility Services Departments and faculty to meet the learning needs of all students. Please contact your Accessibility Services office and ask them to email accessibility@mheducation.com, or visit **www.mheducation.com/about/accessibility.html** for more information.

Brief Contents

Contents

Chapter 1

Production Organization and Management

"Great art conceals art." That statement is attributed to Konstantin Stanislavski, founder of the Moscow Art Theatre and developer of Method acting. He was referring to the phenomenon that occurs when actors create brilliantly believable roles. Great actors don't seem to be working. They make us believe that they *are* the characters and that everything they say or do is happening spontaneously, without thought or effort. What Stanislavski meant was that a seemingly effortless job of acting is the end result of years of training, dedication, and just plain hard work.

Great art *does* conceal art, but not just the art of the actor. Imagine an actor, wrapped in a heavy fur cape, standing on a set that resembles a craggy mountain peak. The "mountain top" starts to tip, the actor stumbles, his cape comes off, and the **followspot** reveals the actor standing in his underwear with his cape around his ankles. Horrified, the spotlight operator tries to turn off her light. But, instead of turning it off, she changes its color from deep blue to brilliant white.

This unlikely scenario illustrates the fact that less-than-great art conceals little. It also demonstrates that Stanislavski's injunction is just as true for the design and technical elements of the production as it is for the actors. It is an illusion. Together, they create the illusionary reality we call theatre. The illusion that the spectators see is just that. A theatrical performance doesn't simply happen; it is the product of a great deal of organization, teamwork, talent, and dedication.

Getting a play from the written word to the stage requires a lot of enjoyable, challenging work. The result of all this effort, the **production team** hopes, will be artistic and artful, but the business of making a script come alive on the stage is a process that isn't all that mysterious.

The Production Sequence

What sequence of events must occur for a play to move from the pages of a script to a live performance before an audience? There are several stages of development for every production.

followspot: A lighting instrument with a highintensity, narrow beam, mounted in a stand that allows it to tilt and swivel so the beam can "follow" an actor.

production team: Everyone working, in any capacity, on the production of the play.

Script

Most, but not all, theatrical productions begin with a script. Some plays begin with just an idea. That idea may be developed by the performing group in a variety of interesting and creative ways. Some evolve into written scripts, and others remain as conceptual cores that the actors use as guides when they improvise dialogue during the actual performance.

Concept, Design, and Construction

We will assume that our hypothetical production begins with a traditional script. After the script has been selected, the producer options it, which is securing the legal rights to produce it. He or she also hires the director, designers, and actors. The members of the **production design team** read the script and then develop the **production concept,** also referred to as the "production approach."

The production concept or approach is the central creative idea that unifies the artistic vision of the producer, director, and designers. In many ways, any production concept originates with the personal artistic "points of view" of the members of the production design team. The personality, training, and prior experiences of each team member will shape their thoughts about the play. One of the primary jobs of the director is to mold these individual artistic ideas and expressions into a unified vision — the production approach or concept — so that, ideally, each designer's work supports the work of the other designers as well as the central artistic theme of the production. Normally, the production approach evolves during the first few **production meetings** from the combined input of the members of the production design team. The principles of the production concept are best explained by example.

Let's assume that our hypothetical production team is working on a production of Shakespeare's *The Merchant of Venice.* Most productions of this play would probably be traditional: Elizabethan costumes and a set that mimics the appearance of the Globe Theatre, the theatre most scholars think was used by Shakespeare. However, some production groups might choose, for a variety of reasons, to develop a nontraditional production concept. In a production of this play directed by Cosmo Catellano at the University of Iowa, the performance was set inside a World War II Nazi concentration camp. In this production, all of the actors in the play were portrayed as Jewish interns of the camp. **Supernumeraries,** dressed as Nazi officers and their female companions, sat in the auditorium and watched the play alongside the paying audience. Additional extras, in the uniforms of concentration camp guards and carrying weapons, patrolled the stage throughout the performance. While the script wasn't altered, the radical production approach forced the audience to concentrate on the Jewish persecution themes that are very much a part of the script.

After the production concept is agreed on, the sets, props, lights, costumes, and sound are designed. Then the various diagrams, sketches, and other plans are sent to shops for construction, fabrication, or acquisition of the production elements (see Figure 1.1).

While the various visual elements are being built, the director and actors are busy rehearsing (see Figure 1.2). After the rehearsal and construction period, which usually lasts three to seven weeks, the play moves into the theatre, and the technical and dress rehearsals begin.

Rehearsals

Technical rehearsals are devoted to integrating the sets, props, lighting, and sound with the actors into the action of the play. During this period the patterns

production design team: The producer, director, and scenic, costume, lighting, sound, and other designers who develop the visual and aural concept for the production.

production concept: The creative interpretation of the script, which will unify the artistic vision of producer, director, and designers.

production meeting: A conference of appropriate production personnel to share information.

supernumerary: An actor, normally not called for in the script, used in a production; an extra; a walk-on.

technical rehearsals: Run-throughs in which the sets, lights, props, and sound are integrated into the action of the play.

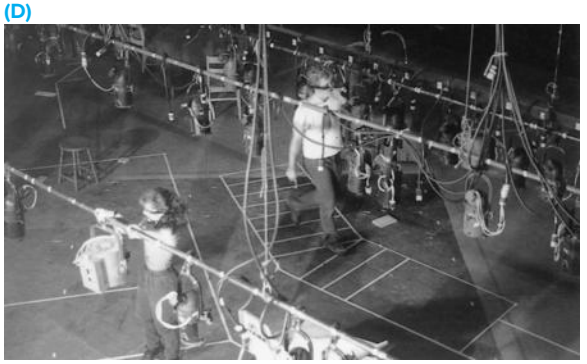
(A)

(B)

(C)

(D)

(F)



(E)

(G)

FIGURE 1.1
A great deal of backstage activity occurs before the production reaches the stage. Photos A, B, Courtesy Erica Von Koerber/Evon Photography. Photos C–G by author.

FIGURE 1.2
The director discusses a scene with the actors. Courtesy J. Michael Gillette.

FIGURE 1.3
Scene shifting must be carefully organized and choreographed. Courtesy J. Michael Gillette.

and timing for shifting the scenery and props are established. The movements of any scenic or property elements (see Figure 1.3), regardless of whether those movements happen in front of the audience or behind a curtain, have to be choreographed, or **blocked,** just as are the movements of the actors. This ensures that the timing and efficiency of each shift will be consistent for every performance. Scene shifts may be numerous or complex enough to warrant holding a separate **shift rehearsal,** in which the director, scene designer, technical director, and stage manager work with the scenery and prop crews to perfect the choreography and timing of all scenic and prop shifts.

The basic timing and intensity of the light **cues** will have been established during the **lighting rehearsal** (which precedes the first technical rehearsal). But during tech rehearsals almost all of the light cues have to be adjusted in some way, because it is the rule rather than the exception that existing cues will be modified, moved, or deleted and new cues added during this time. The lighting designer discusses these modifications with the director and stage manager in the theatre and looks at them on the stage. The intensity, timing, and nature

blocking: Movement patterns, usually of actors, on the stage.

shift rehearsal: A run-through without actors to practice changing the scenery and props.

cue: A directive for action, for example, a change in the lighting.

lighting rehearsal: A run-through without the actors to look at the intensity, timing, and placement of the various lighting cues.

FIGURE 1.4
Sound is normally run from an in-house position. Purdue Theatre sound mix position. Courtesy of Richard M. Dionne.

of the sound cues are subject to similar changes during the technical rehearsals (see Figure 1.4). Depending on the production schedule and the complexity of the show, there are generally one to three tech rehearsals over the course of a week or so.

Prior to any technical rehearsals, preliminary sound levels will have been roughly set for all prerecorded cues. After **load-in**, those cues will be tweaked for the acoustics of the auditorium. Ideally, separate rehearsals will be held to ensure that all wireless mics are working properly and that the positioning of the orchestra mics, if used, results in a well-balanced mix between the singers and the orchestra.

When producing a musical, there should be a full technical sound rehearsal, often called the sitzprobe, where the actors and orchestra sit (the sitz of sitzprobe), and sing/play through the score. This rehearsal is used to get preliminary balance levels between the orchestra and the performers' wireless mics in the performance space.

Unionized productions normally hold a "10-out-of-12" rehearsal: Ten hours of rehearsal in a twelve-hour period. This is the first opportunity to bring all of the various design/technical elements together into a seamless whole and to practice all shifts and transitions so they will flow smoothly during the ensuing technical and dress rehearsals.

The **dress rehearsals** begin toward the end of "tech week." During these rehearsals, which are a natural extension of the tech rehearsals, any adjustments to costumes and makeup are noted and corrected by the next rehearsal (see Figure 1.5). Adjustments to the various sound, lighting, and shifting cues continue to be made during the dress rehearsals. Depending on the complexity of the production and the number of costumes and costume changes, there may be one to three dress rehearsals.

After the last dress rehearsal, there are sometimes one to ten or more preview performances (with an invited audience and/or reduced ticket prices and no critics) before the production officially opens to the public and critics.

load-in: The moving of scenery and associated equipment into the theatre and their positioning (setup) on the stage.

dress rehearsal: A run-through with all technical elements, including costumes and makeup.

FIGURE 1.5
Costumes must be adjusted to fit properly. Courtesy Erica Von Koerber/Evon Photography.

Theatre Organization

More than anything else good theatre requires good organization. Every successful production has a strong "artistic responsibility" organizational structure that follows a fairly standard pattern. Figure 1.6 depicts the organization of a hypothetical, but typical, theatrical production company. Each company's structure is unique to its own needs, and it is doubtful that any two companies would be set up exactly the same. One particular feature of Figure 1.6 should be noted. In this flowchart the director and the designers are symbolized as equals. This equality is essential to the collaborative process that is theatre art and will be discussed at greater length throughout this book. Figure 1.6 delineates the flow of artistic responsibility. It is sometimes called a "make happy" flowchart because the work produced by someone "reporting" to a position higher on the flowchart must artistically satisfy the visual requirements stipulated by that higher position. To illustrate, although they work collaboratively, the visual appearance of the properties must satisfy the scenic designer. It is also important to note what this chart is not: This is not a work responsibility flowchart. A "work responsibility" flowchart would look significantly different. In the real world property masters normally do not "work for" scenic designers. Most property masters work for — are accountable to — the production manager for the on-time, on-budget, as-designed production of properties.

The production meeting is probably the single most important device for ensuring smooth communication among the various production departments. The initial production conferences need to be attended by members of the production design team to develop the production concept. After the designers begin to produce their drawings, sketches, and plans, the production meeting is used as a forum to keep other members of the team informed about the progress in all design areas. At this time, the stage manager normally joins in the discussions.

When the designs are approved and construction begins, the production meeting expands to include the technical director and appropriate crew heads.

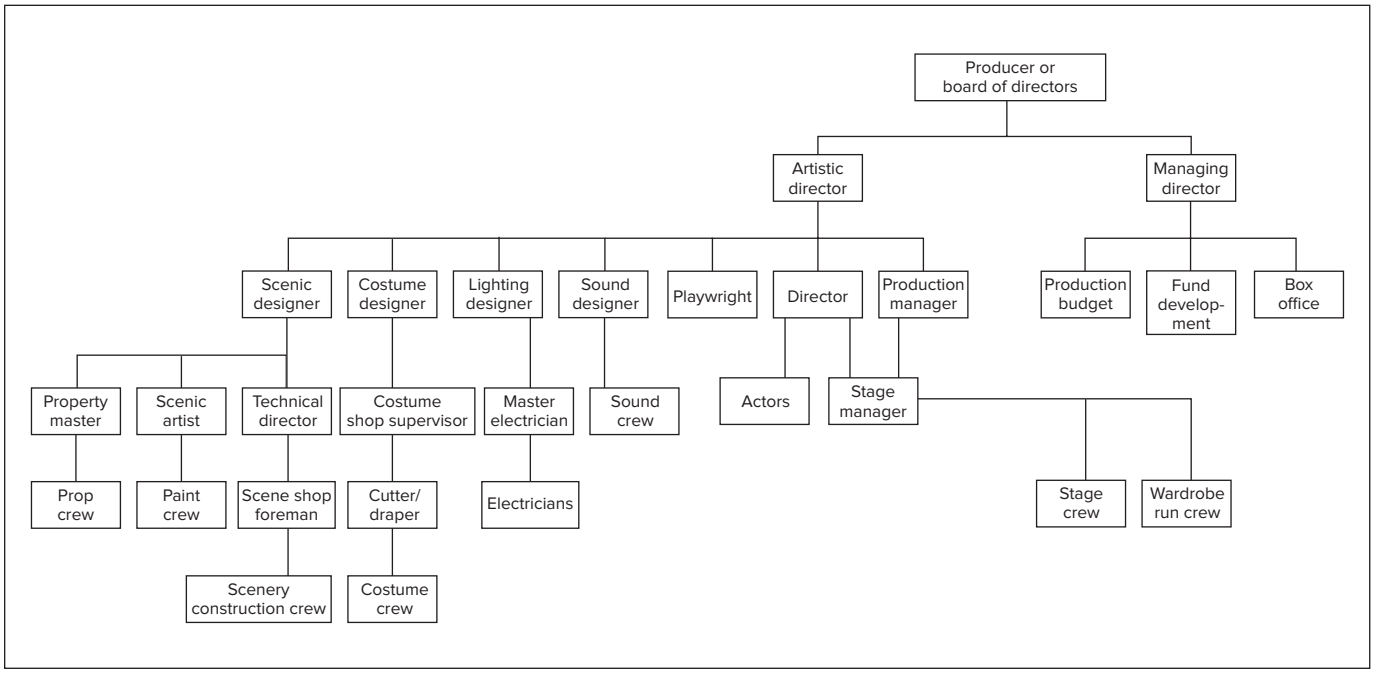


FIGURE 1.6
The organizational structure chart of a typical theatrical production company.

As construction starts, the director becomes heavily involved in rehearsals. At this time, a few adjustments are inevitably necessary in one or more of the design elements. These changes should be discussed and resolved at the production meeting so that all departments are aware of the progress and evolution of the production concept.

While the production concept is being developed, the production meetings are held as often as it is practicable and necessary — daily or less frequently. As the meetings become less developmental and more informational, their frequency decreases to about once a week. The last meeting is usually held just before the opening of the production.

Who participates in production meetings depends, to a great extent, on the nature of the producing organization. A single-run, Broadway-type professional conference usually includes only the members of the production design team and their assistants. A production conference at a regional professional theatre includes the production design team and some of the other members of the permanent production staff, such as the production manager and technical director. For a professionally oriented educational theatre, the staffing of the production meeting is generally the same as for the regional professional production group and ideally will include those faculty supervisors overseeing the work of student designers, technical directors, and crew heads.

The development of advanced communication technologies and the reality that most professional designers are working on more than one project at a time often necessitate that much of the direct communication between members of the production design team take place over great geographical distances. Designs can be sent electronically. Phone, Skype, or video conferences can be used in place of face-to-face meetings. While these developments speed the transfer of data and information, the isolation of the design team members from each other may break down the necessary communication flow within the group. But if everyone is aware of this potential "communication gap," it doesn't have to become a problem.

Production Job Descriptions

Although the organization of any company will fit its own needs, the duties of those holding the various positions will be much the same.

Producer

The producer is the ultimate authority in the organizational structure of a theatrical production. He or she is, arguably, the most influential member of the team. The producer secures the rights to perform the play; hires the director, designers, actors, and crews; leases the theatre; and secures financial backing for the play. The specific functions of the producer vary considerably. In the New York professional theatre most productions are set up as individual entities. As a consequence, the producer and his or her staff are able to concentrate their efforts on each production. They will sometimes be working on the preliminary phases of a second or third production while another show is in production or in the final stages of rehearsal, but in general they concentrate on one show at a time.

Regional professional theatres such as the Guthrie Theatre in Minneapolis, the American Conservatory Theatre (ACT) in San Francisco, the Arizona Theatre Company in Tucson and Phoenix, the Asolo Theatre in Sarasota, Florida, and others have been set up in every section of North America over the past sixty years. Generally, these theatres produce a full seven- or eight-month season of limited-run productions. Some of them have active summer programs. Because of the sweeping responsibilities imposed on the producer within these organizations, the functions of the position are generally divided between two persons, the *managing director* and the *artistic director.* The business functions of the producer — contracts, fund-raising, ticket sales, box-office management — are handled by the managing director, and any artistic decisions — selection of directors, actors, and designers, for example — are made by the artistic director. The managing and artistic directors are hired by the theatre's board of directors, which is responsible for determining the long-range artistic and fiscal goals of the theatre.

In educational theatre, the department chair and administrative staff frequently function in the same capacity as the managing director. The duties of the artistic director are often assigned to a production committee, which selects the plays and is responsible for their artistic quality.

In other nonprofit theatres, such as community or church groups, the functions of the producer are usually carried out by a production committee or board of directors, which functions as previously described.

Playwright

The playwright is obviously a vital and essential link in the production chain. The playwright creates and develops the ideas that ultimately evolve into the written script. In the initial public performance of a play, he or she may be involved in the production process. The playwright frequently helps the director by explaining his or her interpretation of various plot and character developments. During this developmental process, the playwright often needs to rewrite portions of some scenes or even whole scenes or acts. If the playwright is not available for conferences or meetings, the production design team proceeds with the development and interpretation of the script on its own.

Director

The director is the artistic manager and inspirational leader of the production team. He or she coordinates the work of the actors, designers, and crews so that

the production accurately expresses the production concept. Any complex activity such as the production of a play must have someone with the vision, energy, and ability to focus everyone else's efforts on the common goal. The director is that leader. He or she works closely with the other members of the production design team to develop the production concept and also works with the actors to develop their roles in a way that is consistent with the production concept. The director is ultimately responsible for the unified creative interpretation of the play as it is expressed in production.

limited run: A production run of predetermined length, for example, two weeks, six weeks, and so forth.

Production Manager

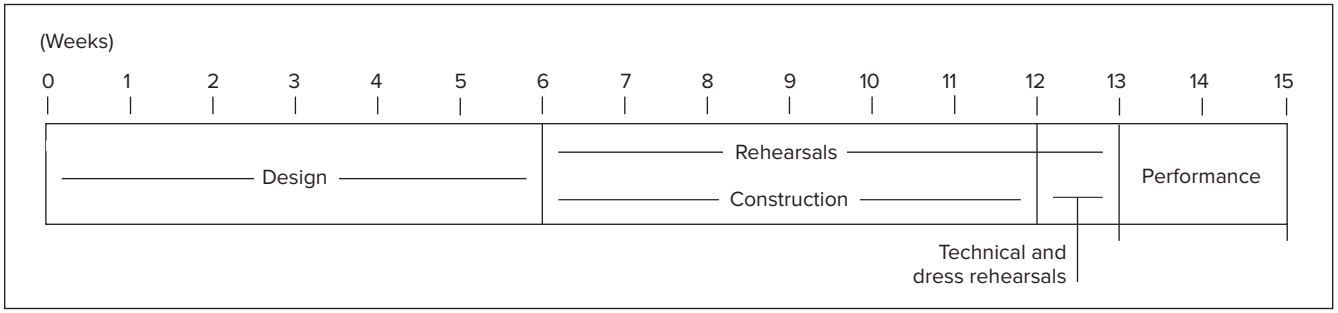
Theatres with heavy annual production programs, such as regional professional theatres and many educational theatre programs, frequently mount several productions or production series simultaneously, often in multiple theatres or venues. In many of these situations the directors and designers are hired or assigned for only one production per year. At the same time the "construction people" — those who actually build the scenery, props, costumes, lights, and sound — are normally hired on an annual basis to work/supervise all of the shows that are produced by that organization. Typically, the technical director runs the scene shop and supervises the production of the scenery for every play in the company's season. Similarly, the property director runs the prop shop and supervises the creation/acquisition of the props used in each production. The same applies for the costume shop supervisor, master electrician, and so forth. Someone on the organization's permanent staff needs to be in control of, and facilitate communication between, the individual design teams and the "permanent" production staff. Enter the production manager.

The production manager is typically responsible for keeping the individual production teams on track, on budget, and on time. He or she oversees the transition from plans to performance for each production and is responsible for managing the producing organization's production budget, personnel, and calendar, and generally keeping everything moving smoothly.

The production manager must be an adept mental gymnast, because this important position has the responsibility for coordinating the complex activities associated with a multishow season. Each production within the theatre's season requires its own logistical structure to bring it from concept to the stage. Figure 1.7 illustrates a typical period needed to develop a play from production concept to reality. Because most regional professional theatres or professionally oriented educational theatres produce eight to twelve **limited-run** plays a season, frequently on several different stages, they must develop rehearsal and performance schedules for all of them simultaneously.

The production calendar shown in Figure 1.8 is used by the production manager to help keep track of the various stages of development for each play in the season. This master calendar contains all pertinent information regarding

FIGURE 1.7
The production calendar shows the time line for each limited-run production from the initial production conference until the closing night.



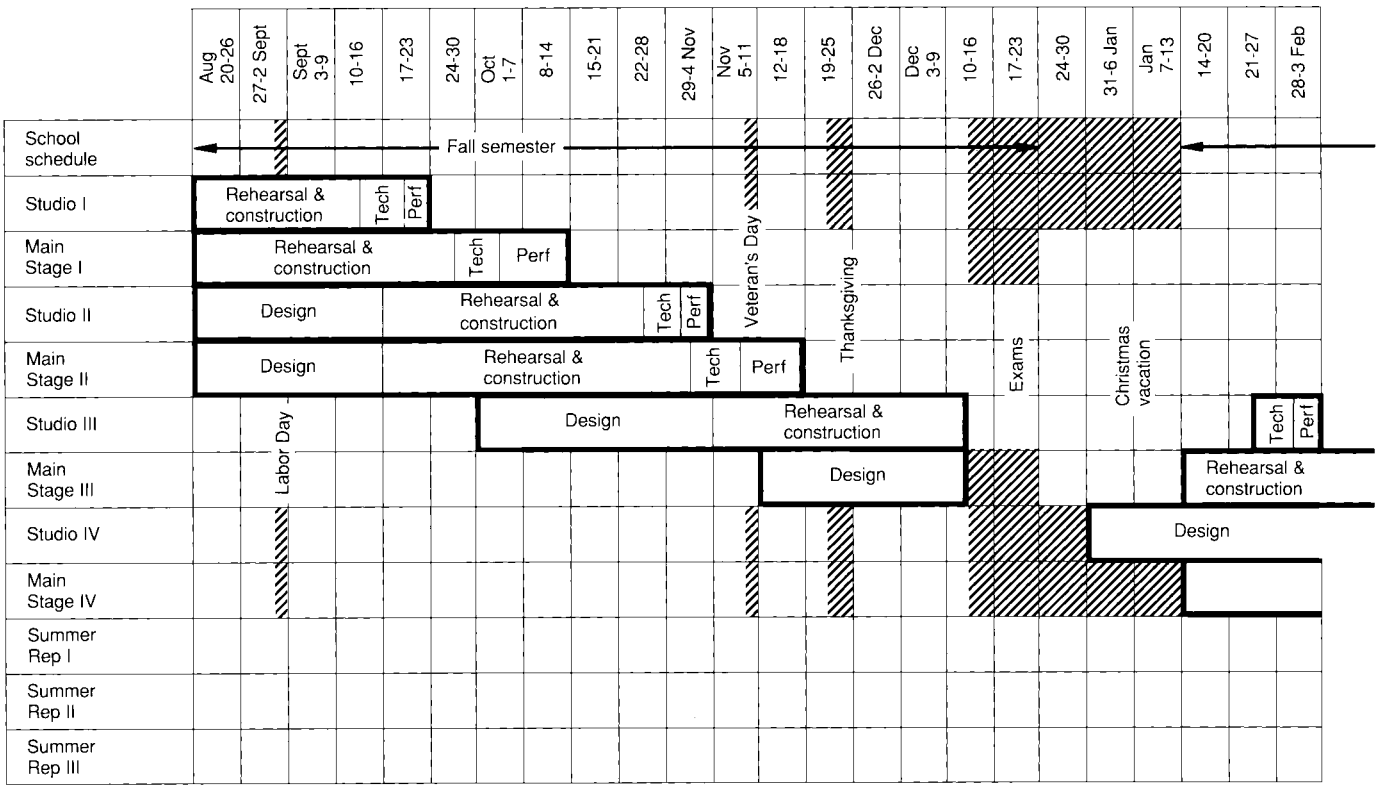


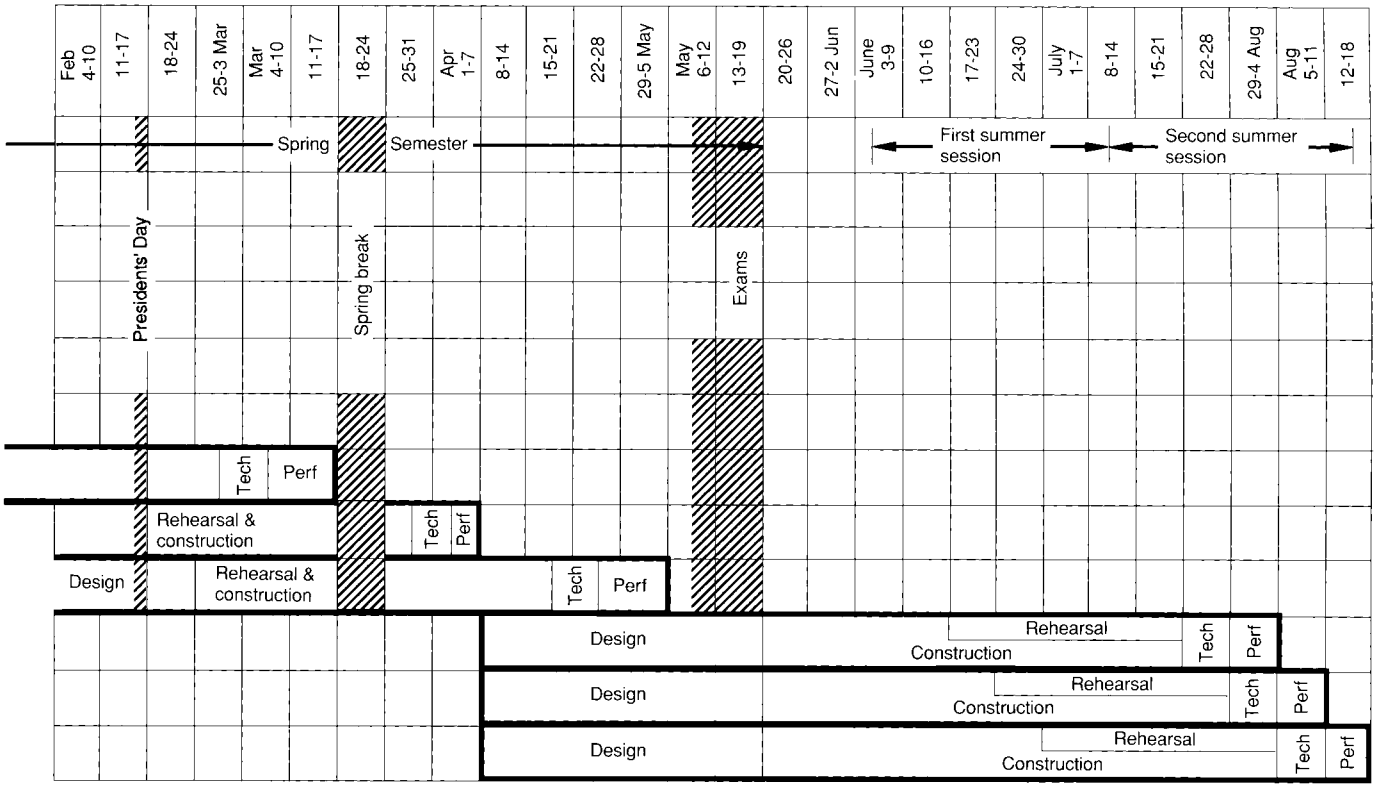
FIGURE 1.8
A sample production calendar.

PRODUCTION INSIGHTS

Backstage Etiquette

Although every production company has specific rules that relate to its own production circumstances, some general rules of backstage etiquette are universal.

1. Don't talk to other crew members backstage during rehearsals or performances unless it is about the business of the production. Then talk only in a low whisper.
2. Don't talk to the actors backstage during rehearsals or performances unless it is about the business of the production. Their job — acting — takes a great deal of concentration, and they shouldn't be distracted.
3. Wear dark clothes, preferably dark blue or black, to minimize the distraction to the audience if you are seen. Wear sturdy rubber-soled shoes (no tennis shoes, cowboy boots, sandals, or flipflops). Sturdy shoes will protect your feet, and the rubber soles will minimize noise.
4. Be sure to show up on time for your crew call (the time you are scheduled to arrive at the theatre ready for work). Sign the sign-in sheet, and check in with your crew head for work.
5. Don't smoke, eat, or drink backstage.
6. Do not touch props, costumes, or stage equipment that are not your responsibility.



tryouts, rehearsals, design and construction deadlines, technical and dress rehearsals, and performances. From the production calendar, the production manager gleans the information necessary to coordinate the assignment of personnel and rehearsal space as well as the scheduling of the various production meetings and other necessary activities.

Stage Manager

The stage manager can be compared to a gifted, slightly eccentric master mechanic who keeps a cantankerous, highly complex machine running at top efficiency by talking to it, soothing it, and lovingly fixing whatever is broken. The stage manager's overarching function is to serve as the central hub for communications between the director and the various designers and shops. Typically, any communication between those groups is relayed through the stage manager to assure that every note is delivered and "no ball gets dropped." The specific duties of the stage manager can be broken down into two primary categories: (1) Facilitating the director during rehearsals and (2) being responsible for all backstage activity after the show opens.

The stage manager is hired or assigned to the production at about the same time as the director. In the professional theatre, the stage manager must be a member of Actor's Equity, the actors' union. Sometimes the stage manager finds him or herself in an awkward position because he or she not only assists the director but also, if elected the Equity deputy by the union actors, functions as the enforcer of the Equity rules during rehearsals and performances. Because the Equity deputy can be viewed as enforcing the union rules to save money

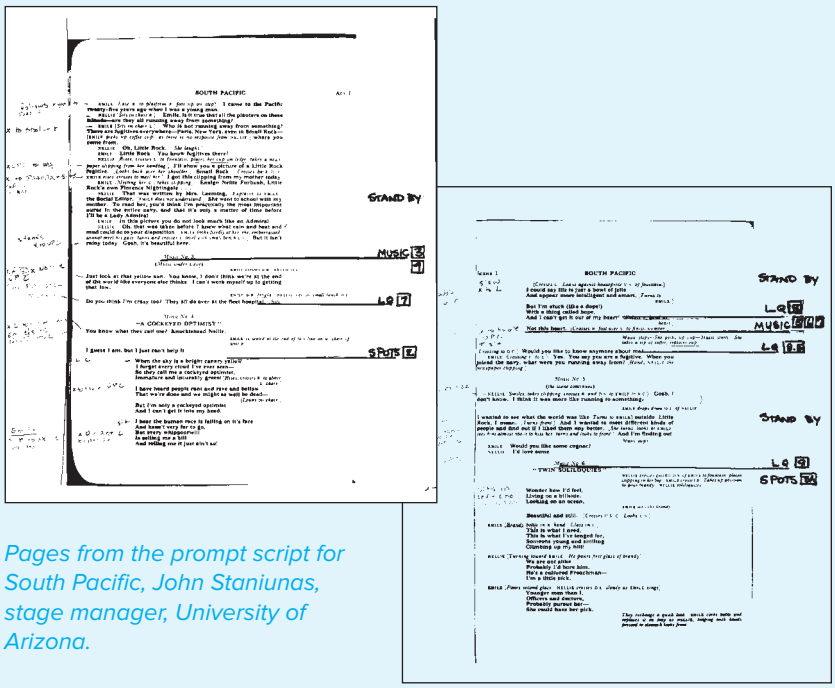
PRODUCTION INSIGHTS

Stage Manager's Prompt Book

The stage manager's prompt book is the bible of the production. The stage manager details all pertinent information about the production in a loose-leaf notebook as shown below. Each page of the prompt book contains one page of the script. The blocking is usually indicated in the wide margins of the pages with arrows showing the movement of each actor. Some stage managers prefer to place a ground plan of the set on the facing page for each page of the script. The blocking and notes are then placed on this sheet.

The nature, location, and duration of each technical cue (lights, sound, shifting) are also written in the margins. Warning cues (to prepare the appropriate personnel for any forthcoming cues) are normally placed in the prompt book about half a page before the cue location.

The prompt book also contains a ground plan of the set(s), a prop schedule detailing the placement and conditions of props ("a half-full glass of milk on the coffee table"), and a "contact sheet" listing the phone numbers and addresses of all cast members, crew members, and other production personnel. While electronic tablets and laptops have been, and are being, used for this purpose on some productions, the loose-leaf notebook remains the predominate form of prompt book.



Pages from the prompt script for South Pacific, John Staniunas, stage manager, University of Arizona.

for the producer, some stage managers decline to serve as deputy because of the potential conflict of interest. Other stage managers elect to serve as deputy because they are already in a leadership position and do not see these activities as a conflict of interest.

The stage manager helps the director by taking responsibility for the majority of administrative details. They include such diverse activities as making sure that the ground plan of the set is taped or chalked on the floor of the rehearsal

hall, arranging for rehearsal furniture (substitute furniture for the set) as well as tables and chairs for the director and other production personnel, and writing the blocking in the stage manager's **prompt book.**

The stage manager also assists the production by keeping information flowing among the director, the designers, and the various technical shops. During the rehearsal process, the director may decide to introduce a piece of **stage business** that requires the modification of some technical element. If the director decides that an actor should bounce a ball against one of the set walls, the stage manager needs to tell the set designer that section of the wall must be sturdy enough to handle the action.

Until the production moves into the theatre — or until the beginning of technical rehearsals, if the play has already been rehearsing in the theatre — the stage manager usually sits beside the director to facilitate communication. When technical rehearsals begin, the stage manager typically moves to the location from which he or she will **call** the show. The crew members will have previously recorded what to do on their cue sheets, but they don't start the action until they receive their "go" cue from the stage manager. Stage managers have traditionally called the show from backstage, because this location kept them in close contact with the cast and crew. However, the development of new theatre conventions, environments, and equipment enables the cast to make entrances through the auditorium and allows the lighting and sound operators to be in the optimal positions for seeing and hearing the stage action. This dispersion of the actors and crew from the backstage space has freed the stage manager to call the show from whatever position, including backstage, provides the best overall view of the action.

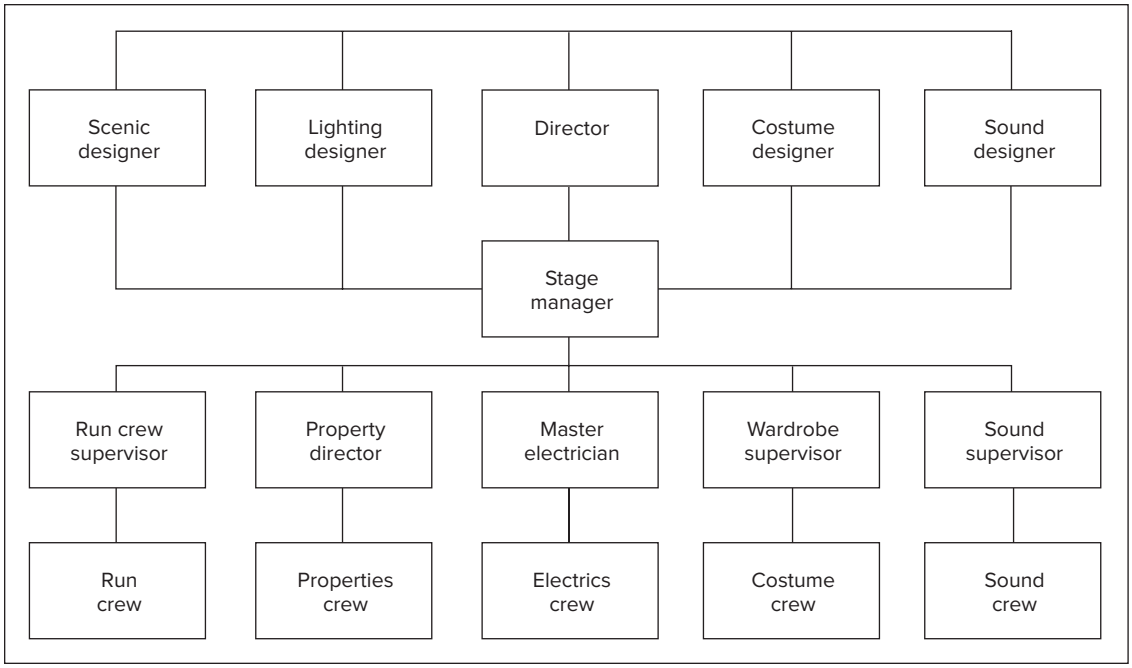
When the stage manager begins to call the show, the primary focus of his or her responsibility changes from administrative support for the director to technical coordination of all production activities. The director and various designers determine the nature and timing of the cues, but it is the stage manager who is responsible for seeing that those instructions are carried out. Figure 1.9 illustrates the change in organization that takes place when the play goes into technical and dress rehearsals and performances. The designers still discuss

prompt book: A copy of the script with details about each actor's blocking as well as the location, timing, and, as necessary, action, of all set, prop, light, and sound cues.

stage business: A specific action, also known as a "bit," performed by an actor during the play.

call: To tell specific crew members when to perform their cues.

FIGURE 1.9
The organizational structure changes as a play goes from regular rehearsals into the tech/dress rehearsals and performances.



conceptual and aesthetic issues with the director, but they usually communicate specific information related to cues that will be called by the stage manager directly to the stage manager.

The stage manager calls the show from notes written in the prompt book. Preliminary locations for many of the cues will have been noted in the book during the rehearsal period. During the tech and dress rehearsals, the location, timing, and character of these cues are adjusted. When the last dress rehearsal or preview performance is finished, the prompt book will contain a complete and accurate set of instructions for running every cue in the production.

Scenic and Property Personnel

Those who work with the scenery and props in a production are the scenic designer, the scenic artist, the paint crew, the property master or director, the technical director, the scene-shop foreman, the construction crew, and the stage and property crews.

Scenic Designer The scenic designer is responsible for the visual appearance and function of the scenic elements used in the production. The scene designer, normally in collaborative partnership with the property director, shares responsibility for the design and function of the production's props. To translate the scenic design from concept to the stage, the designer produces either hand-drawn or computer-generated colored sketches or renderings of the sets and properties, scale models of the various sets, and scale mechanical drawings that fully describe the settings (see Figure 1.10). When appropriate, the scene designer may also produce computer animations to describe any scenic movement.

When projections are part of the production concept, a projection designer or specialist is frequently brought onboard the design team to handle this specialty area. He or she works closely with other members of the design team to ensure design unity and that all technical challenges are solved.

The scenic designer's job will be explored in greater depth in Chapter 9 as will the projection designer's work in Chapter 17.

Scenic Artist The scenic artist, under the supervision of the scenic designer, is responsible for the painting of the scenery. He or she needs to be an excellent craftsperson capable of working in a variety of media and styles. Although the scenic artist does a great deal of the actual scenic painting, he or she is also responsible for supervising the work of the paint crew.

Paint Crew The paint crew, under the supervision of the scenic artist, paints the sets and sometimes the **properties.** This challenging job involves painting the set (walls, floor, background, properties) to make it reflect the character of the design. Rarely do playwrights set their plays in freshly painted environments. More frequently than not the paint crew must make the set look old, tired, abused, and worn. Techniques for achieving these results are detailed in Chapter 12, "Scene Painting."

Property Master The property master, or property director, is a unique artisan in the theatre. He or she works collaboratively with the scene designer on the design of all props for a production, manages the prop shop, and supervises the prop shop personnel in the acquisition and construction of all props.

This jack-of-all-trades artisan turns design sketches/ideas into working drawings. This individual must be skilled in all phases of property construction

properties: Such elements as furniture, lamps, pictures, table linens, bric-a-brac, and window drapes that provide the finished set with visual character.

(A)

(B)

FIGURE 1.10
(A) Digital rendering of the set design for the American Repertory Theatre production of *The Tempest.* Director: Aaron Posner. Set design: Daniel Conway. Lighting design: Chris Akerlind. Music by Tom Waits. Magic by TELLER. 2014. Photo courtesy of Daniel Conway. (B) Production model for the Olney Theatre Center's production of *Dial M for Murder.* (The furniture and set dressing are 3-D printed.) Director: Jason King Jones. Set design: Charlie Calvert. Photo courtesy of Charlie Calvert.

and have a thorough knowledge of construction techniques in wood, plastic, metal, cloth, and other materials; sculpting; furniture construction; upholstery; welding; and electronics. He or she must also be an effective communicator as the person in this role is frequently engaged in discussions with directors, designers, actors, stage managers, and other production personnel.

Traditionally the property director worked under the artistic supervision of the scenic designer. In producing organizations with a property master on staff,

such as many regional professional theatres, the relationship tends to be more collaborative. The reasons are logical: (1) Many scene designers are hired for only one show out of an organization's season while resident or on-staff property directors work all the shows in any given season; (2) electronic communication has made it simple, fast, and effective to hold discussions and send notes, ideas, and sketches to literally anywhere in the world. Now, regardless of where the scene designer might be located, the scene designer and the property director, functioning as a de facto on-site property designer, can collaborate on the design of the stage props.

The property director closely coordinates with the scenic, lighting, sound, and costuming departments when any technical needs overlap among those departments.

Chapter 13, "Stage Properties," contains additional information about the property director's duties, the organization and running of a prop shop, as well as the making and **running** of stage props during a production.

Property Crews There are two types of property crews — construction and running. Under the supervision of the property master/director, the making and acquiring of properties is the responsibility of the property artisans. They are responsible for the creation and acquisition of all props used in a production. The skills needed to be a good property artisan are amazingly varied. Woodworking, furniture restoration/conservation/alteration and upholstery, welding, sewing, electronics, sculpting, graphics/drafting, special effects, and weaponry are but a few of the skills needed. And that's just for those artisans who *build* and decorate the props. Other prop artisans specialize in buying and renting props. The individual property artisans are expected to be innovative, creative, collaborative artists working to honor the specific intent of each prop design while making those props safe and stage worthy.

The property running crew, under the supervision of the stage manager, is responsible for tracking, placing, and maintaining all props during rehearsals and performances.

During technical rehearsals both crews work together to implement any changes/notes coming from the technical rehearsal, but when the show "opens" the running, or run, crew has control of the props for that production.

Technical Director The technical director, also known as the TD, is responsible for purchasing construction materials, supervising the building of the scenery, transporting the sets from the shop(s) to the theatre stage, mounting the scenery onstage, overseeing the work of the scenic crews during rehearsals and performances, and maintaining the scene shop's equipment and supplies. To order the materials and build the scenery the TD typically draws a full set of construction **plates** based on the designer's plans submitted by the scenic designer. These construction plates show the construction details and techniques that will be used to build the scenery.

An introduction to scenic and property production (the organization, tools, and construction techniques) is discussed in Chapters 10 ("Tools and Materials") and 11 ("Scenic Production Techniques") and Chapter 12 ("Scenic Painting"), as well as Chapter 13 ("Stage Properties").

Scene-Shop Foreman The scene-shop foreman or master carpenter, under the supervision of the technical director, is responsible for the construction, mounting, and rigging of the scenery. He or she usually supervises a crew of carpenters in the actual construction. The foreman is also normally responsible for the maintenance of the scene-shop equipment and supplies.

running: Controlling or operating some aspect of production.

plate: A sheet of mechanical drawings, drawn to scale.

Construction Crew The construction crew is composed of the people who build the various pieces of scenery and properties for the production. After the set has been built and painted, they move the sets from the shop to the theatre and assemble them on the stage.

Stage Crew The stage crew **shifts** the set during technical and dress rehearsals and during the performances. This work is accomplished under the supervision of the head carpenter, who is normally the most senior union scenery stagehand. On non-union productions, this crew leader is frequently called the shift crew head.

Lighting Personnel

The lighting staff is made up of the lighting designer, the master electrician, the programmer, and other electricians and board operators.

Lighting Designer The lighting designer is responsible for the design, installation, and operation of the lighting and special electrical effects used in the production.

To present their visual ideas, lighting designers frequently draw sketches or show visual examples — paintings, photographs, and so forth — that demonstrate the type and style of lighting that they intend to create. Various computer rendering/modeling/animation programs can be used to create virtual examples of how the lighting is going to look. With currently available programs it is possible to scan in a rendering of the set, add a character or two, then add the lighting and print the result on a color printer. As computer technology continues to improve and rendering times are reduced, digital imagery will probably become the preferred method of demonstrating the lighting designer's concepts, simply because a computer image, whether printed or seen on the monitor, provides an extremely accurate, evocative visualization of the designer's intentions — one that was unavailable prior to the development of computer imaging.

To show where the lighting equipment will be placed, the lighting designer produces a light plot, which is a scale drawing that details the placement of the lighting instruments relative to the physical structure of the theatre and the location of the set. The techniques and materials that the lighting designer uses are discussed in Chapters 14 ("Lighting Design"), 15 ("Electrical Theory and Practice"), 16 ("Lighting Production"), and 17 ("Projections").

Assistant Lighting Designer While the lighting designer's primary duty is to concentrate on the artistic elements of the lighting design, it is often said that a lighting design is only as good as its paperwork. Producing that paperwork is the role of the assistant lighting designer. This person is responsible for creating and continually updating the various types of paperwork that are an essential element of any good lighting design. That paperwork will be explained in Chapter 14, "Lighting Design." The assistant lighting designer may also, at the discretion of the designer, assist with focusing, organization of work, and so forth.

Master Electrician The master electrician, under the supervision of the lighting designer, implements the lighting design. He or she is directly responsible for the acquisition, installation, and maintenance of all lighting equipment and the supervision of the crews who hang, focus, and run the lighting equipment.

Programmer Programmers are individuals who program the specialized consoles used to control automated lighting fixtures and projectors. They generally

shift: To change the position of the scenery, props, or stage equipment.

work under the aesthetic direction of the lighting designer. Programmers may be freelance technicians although they are also often associated with companies that manufacture or distribute automated fixtures or projectors. Programmers are usually hired for individual projects that use these highly specialized fixtures and projectors rather than being employed by a producing organization for the full run of a show or for an entire season. Programmers normally run the console for one-time performances such as television specials and concert events where making adjustments "on-the-fly" is frequently the norm rather than the exception. For events with more consistent performance expectations, such as theatre performances with multiweek (or longer) runs, programmers normally train other electricians to serve as board operators for the specialized consoles.

Electricians The work of the electricians can be divided into three areas: **Hanging, focusing,** and running. The *hang crew* places the lighting instruments and associated equipment in the positions designated by the light plot. They also **circuit** and **patch** the instruments. The circuit and dimmer for each instrument are indicated on the light plot or **hookup sheet;** or the master electrician designates the appropriate circuit and dimmer before or during the hanging session. The hang crew also puts the **color media** on the lighting instruments and, under the supervision of the lighting designer, **focuses** the instruments.

The *running crew* is responsible for the operation of the lighting equipment during the rehearsals and performances. Depending on the complexity of the production, as few as one or as many as five or more electricians are needed to run the lights.

Costume Personnel

Those staff members who are responsible for the production's costumes include the costume designer, costume shop supervisor, cutter/draper, and costume construction crew.

Costume Designer The costume designer is responsible for the visual appearance of the actors. These responsibilities include both clothes and undergarments. Undergarments aren't seen but can be just as important as the clothes that cover them. Corsets, hoops, and boning create the distinctive silhouette and appearance that tell us much about the costumes of specific periods. Additionally, character elements such as padded stomachs, sagging bosoms, and so forth add greatly to the audience's understanding of the nature of each character. The visible costume elements include the clothes, accessories (shoes, hats, purses, canes, parasols), jewelry, wigs, and makeup worn by the actors during the performance.

Designs for theatrical costumes consist of colored sketches depicting the clothing and accessories that will be worn by an actor. In the case of complex costume designs, sketches that show more than one view may be needed. In either case, the sketches, which can be either hand- or computer-drawn and painted, normally have appropriate construction notes jotted in the margins, and small swatches of the fabrics and trims from which the costumes will be made are usually attached to the sketches. Additional information about costume and makeup designs as well as costume production can be found in Chapters 18 ("Costume Design"), 19 ("Costume Construction"), and 20 ("Makeup").

Costume Shop Supervisor The costume shop supervisor or manager, also known as the costumer or costume technician, is the person who, under the artistic supervision of the costume designer, supervises and participates in

hanging: Placing lighting instruments and equipment in the designated positions on the light plot.

focusing: Directing light from the lighting instruments to a specific area.

circuit: To connect a lighting instrument to a stage circuit.

patch: To connect a stage circuit to a dimmer circuit.

hookup sheet: A sheet containing pertinent information (hanging position, circuit, dimmer, color, lamp wattage, focusing notes) about every lighting instrument used in the production. Also known as an instrument schedule.

color media: The plastic or glass filters used to modify the color of light projected by lighting instruments.

focus: To direct light from a lighting instrument to a specific location.

the building of the costumes. The costume technician must be able to read and translate the costume designer's sketches into working garments, be skilled in all phases of costume construction, including pattern making, and be able to work with the designer and actors as well as supervise the shop personnel. In many operations, the costume shop supervisor is also responsible for maintaining the costume shop equipment and keeping the shop inventory of basic supplies current.

In larger costume operations, the duties of the costume shop supervisor are frequently divided into two parts — the costume shop and the craft shop. Each may have its own manager, although the craft shop sometimes is managed by an assistant to the costume shop supervisor. The costume shop constructs the costumes — cuts, drapes, sews the fabric — while the craft shop generally creates "crafty" things — dyeing and painting fabric before it is cut and constructing shoes, accessories, millinery, jewelry, and specialty costumes such as animals, masks, and so forth.

Additional information about the work of the costumer and costume construction can be found in Chapter 19, "Costume Construction."

Costume Crew The costume crew can be divided into several specialty areas. Depending on the type (professional or educational) and size of the costume operation, these areas may or may not have their own heads, assistant heads, and crew members.

The *cutter/draper* is responsible for actually translating the designer's sketches into reality. He or she devises an appropriate pattern using either draping or flat-patterning methods and, generally, cuts the fabric. This is an extremely important job because not only the shape of the pattern, but also how it is cut from the fabric — how the pattern is placed on the fabric in relation to the **warp and weft** or grain of the fabric — greatly affects the finished appearance of the costume. The *first hand* may also do some cutting from patterns developed by the cutter/draper, but this job is generally to supervise the construction of the costumes. Sewing of the costumes is done by *stitchers* who operate the machines and do the hand sewing that pieces the costumes together. Depending on the size of the production, there may be more than one cutter/draper on the show. If so, their responsibilities are frequently divided along gender lines, with one team (cutter/draper, first hand, stitchers) making the female costumes and another team making the male costumes.

Dyers/painters dye and paint the fabric. They select and mix the dyes to the costume designer's specifications, dye the fabric before it is cut, paint or embellish finished costumes to add dimension, and distress or age costumes to make them look old and worn.

Hats are an important accessory for many period and contemporary costumes. They are frequently made in the costume shop by the *milliner.* Wigs, like hats, are an important part of costuming. The *wigmaster* not only styles and arranges wigs but also makes them.

Although many theatres adapt modern footwear through the use of appliqúes that disguise the period of the footwear being worn, a complete costume shop frequently has the necessary equipment and expertise required to construct period footwear, or it has access to a company that produces this specialized work. The person who does this work is generally referred to as the *costume craftsperson.*

After the show moves into performances, the *wardrobe supervisor* is responsible for all costumes and accessories. Under the wardrobe supervisor's guidance, the costume crew cleans, presses, stores, and organizes the costumes, **dresses** any wigs or hairpieces to create a specific style or look, and makes any

warp and weft: The vertical and horizontal threads in a fabric.

dress: In this context, dress refers to the process of curling, combing, teasing, and/or brushing necessary to maintain the style of a wig or hairpiece.

necessary costume-related repairs. The costume crew also places all costumes and accessories in their appropriate locations — actors' lockers, quick-change dressing rooms, and so forth — before and during the dress rehearsals and performances. During dress rehearsals and performances, *dressers* may assist the actors in getting into their costumes, quick changes, and so forth.

Makeup Personnel

The makeup designer is responsible for the design and execution of makeup. A small crew may be needed to assist the actors in the application of makeup, particularly if prosthetic devices such as three-dimensional pieces or beards and wigs are used.

Makeup Designer The makeup designer is responsible for the visual appearance of makeup worn by the actors. The makeup designer works closely with the costume designer to create a look for each actor that will visually support the character. Many times the makeup designer *is* the costumer designer. In the professional theatre actors may actually design their own makeup or work closely with the makeup designer in the creation of a character's makeup.

Makeup Crew Actors are generally responsible for the application of their own makeup during a production, particularly if the design is basically **street makeup.** That said, if the design is unusual — for example, if it is fantasy-based or if it involves prosthetics or aging, or if some members of the cast are inexperienced in makeup application — a small crew may be needed to assist the actors in the proper execution of the designs.

Sound Personnel

The size of sound team working on any particular production depends on the show's budget, venue, and whether the production is a musical or non-musical play. It can range from a single individual who designs, installs, and runs the sound for a simple production to an extensive crew with multiple designers, assistants, engineers, installers, and operators for a unionized major production. Irrespective of the number of people working on the sound team, the duties outlined here need to be accomplished for every production.

Sound Designer The sound designer is responsible for all the artistic content related to sound for a given production. He or she provides the designs for all pre-recorded music, sound effects, and the reinforcement of live voices, musical instruments, and sound elements. The sound designer is also responsible for all sound-related technical drawings and the specifications for any sound equipment to be rented, leased, or purchased. The sound designer is also responsible for setting all sound cues. In some situations, he or she may also be responsible for the installation of any non-permanent sound equipment.

Many sound designers cross-train so they are competent in multiple specialty areas within the field: Sound scoring, sound reinforcement, and sound system design/operation. Some are also competent in musical composition. At the highest levels of professional theatre, sound designers tend to specialize in either musicals or non-musical plays.

Production Sound Engineer The production sound engineer — also known as the A1, front-of-house mixing console operator, or sound mixer — runs the sound mixer during the production. He or she is responsible for mixing all of

street makeup: Makeup worn in everyday life.

the sound elements — music, effects, vocal reinforcement — into a cohesive and balanced whole.

Complex productions may also use a monitor engineer. He or she is responsible for sending an appropriate balance of sounds to the orchestra musicians as well as the onstage performers.

The assistant production sound engineer — also called the A2 or wireless mic technician — works backstage during the production, managing any sound issues and ensuring all wireless mics are working properly.

Larger musicals may employ another assistant, unimaginatively referred to as the A3. The specific duties of the A2 and A3 are usually interchangeable and dictated by the needs of the production.

Sound Engineer and Crew The titles and duties of the sound engineer and crew are flexible and vary depending on union status and the producing organization. Their general duties are to install and maintain the sound system in all rehearsal and performance spaces and to ensure that all equipment functions as intended. During rehearsals, they perform any necessary sound recording, editing, and playback as required. During the production run, they operate and maintain all sound equipment.

Additional information about sound design, equipment, and production techniques can be found in Chapter 21, "Sound Design and Technology."

Chapter 2

The Design Process

Design is more a process than an art. That statement may come as a shock to some, but it's true. Design is a series of steps through which we pursue the goal of creating a work of art — a scenic design, costume design, lighting design, or audio design — or the artistry of an efficiently coordinated production.

The design process is a method for finding answers to questions. The examples and terms used in this chapter will direct your thinking toward theatrical design and production, but the principles of the design process can be applied with equally productive results to acting, directing, and, for that matter, life in general. Effective use of the design process can help you discover creative solutions to virtually any design challenge. This problem-solving model consists of seven distinct phases: (1) commitment, (2) analysis, (3) research, (4) incubation, (5) selection, (6) implementation, and (7) evaluation.

The design process isn't a simple, linear progression. As you move through the steps, you need to check back on your previous steps to make sure that you are headed in the right direction with your proposed solution. Figure 2.1 shows the back-and-forth movement that occurs as you move through the various stages of the design process.

A perceptive teacher/designer, Alison Ford, suggests that "perhaps good design is the intersection between the emotional and intellectual realms." While the process discussed in this chapter is primarily intellectual, it is essential for you to understand that emotions are an equally important part of the design equation. Your emotional reaction to the script and the production approach will intuitively guide your work on any project. Audience members strongly respond to the emotional content of a production — the story told by the script, the personalities of the characters and their interrelationships, as well as the scenic, costume, lighting, sound, and projection designs. You need to include your own emotional reactions and personal life experiences as you develop your own design ideas and your personal artistic point of view. Your work will be better for it.

Commitment

Commitment is the most important step in the whole design process. If you wholeheartedly *commit* your energies to an assignment, you are promising yourself that you will do the best work you can possibly do.

A simple semantic game may help you commit to an assignment. Use the word *problem* as infrequently as possible — it has a negative connotation — and substitute the word *challenge.* Everybody likes a challenge: The word itself hints at fun, games, and competition. When your design problem has been transformed into a design challenge, it automatically becomes more interesting and manageable.

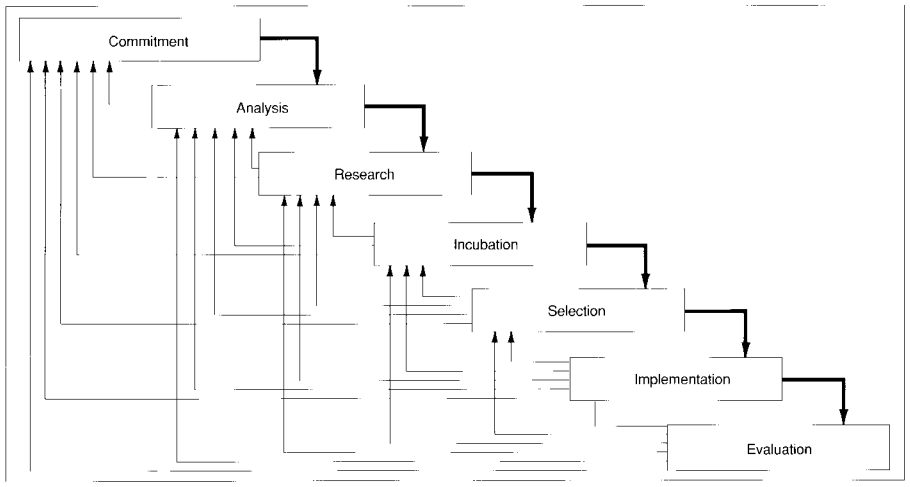


FIGURE 2.1
The design process is not simply a linear progression. As you move through the steps of the design process, you monitor your progress by continually checking back to see where you have been.

Analysis

The analysis step has two objectives: (1) gathering information that clarifies and refines the challenge and (2) identifying areas that require further research.

Analysis involves searching for information and making objective evaluations of the data you discover. There are two primary sources for this information: the script and other members of the production design team. In your discussions with the producer, director, and other designers, you will need to examine everything — production style, concepts, budgets, schedules — relevant to the design project. "*Who* is producing the play? *What* is the production budget? *Where* is the play being produced? *When* is the design due? *Why* are we doing this play? *How* is the scenery being moved from the shop to the theatre?" The answers to these questions will provide information to help further define and clarify your challenge. Each answer will probably raise another question or two. Ask them. This **stream-of-consciousness questioning** will provide you with invaluable information about your challenge.

At some point, you will read the script. Some designers prefer to first read the script before they talk to other members of the production design team; others wait until later. Either way is fine. There isn't any rule about when you should read the script. Just make sure after you've read the script that you discuss and share your ideas about it with the other members of the production design team.

Analyzing the Script

The script provides you with needed information. To glean that information, designers usually read the script many times. You will be searching for three related kinds of information: (1) the general flavor of the script; (2) moments within the script that stimulate your imagination; and (3) specific objects or items that need to be incorporated into the design.

The following sections, hypothetically labeled "first three readings," aren't a literal recommendation that you only read the script three times. It's simply a convenient way to categorize the types of information that need to be gathered when reading the script.

stream-of-consciousness questioning: Asking whatever relevant questions pop into your mind in the course of a discussion.

First Reading The first time you read the script, read it for fun. Discover the flavor of the play. Learn its general story line, the nature of its characters, their interrelationships, and your emotional response to the play. Unless you are working on an original, never-before-produced play, one of the first things you read when you open a script is usually a description of the physical environment of the play. Usually written in italics just before the opening lines, it describes the set and, occasionally, the costumes, sound, and lights. These descriptions are generally taken from the stage manager's prompt book of the first major professional production of the play. They describe the design for that particular production. These descriptions shouldn't be thought of as "correct" design solutions for the play; they are just one way that the show can be designed. Your production, along with your audience, is entitled to a fresh design treatment that will be appropriate to its personnel, time, place, and budget. To believe that you have to, or should, copy the original design is an insult to your creative ability. Use the descriptive information in the script along with the other information you gather to synthesize your own original design concept.

Second Reading You also need to be looking for specific moments and incidents within the play that stimulate your imagination and provide you with strong visual and textural images and feelings. These inspirations are often random, disconnected thoughts, impressions, and emotions about the appearance of the various design elements. Make notes about these thoughts. If they are more visual than verbal, sketch them. Always carry something on which you can make notes. Whenever a thought, idea, or emotion about the play pops into your mind, regardless of when it occurs or how inconsequential it seems, jot it down. These thoughts and emotional responses can be anything relevant to the design challenge. A thought about a character's texture — "He is rough like burlap" — is an idea that should be noted. An impression that the atmosphere of the play is hot, heavy, and sticky is important. Your sense that the play is soft and curved, not sharp and hard, should also be noted.

As you continue to reread the play, you will get more ideas. Ideas frequently appear when you are not reading the script. They can materialize when you are talking to the director, discussing the play with another designer, eating breakfast, or walking to class. Don't judge the ideas at this point. Gather information now, weed later.

Third Reading The third type of information you're trying to find is more mundane. For example, set designers look for such things as the number of sets, whether the scene changes are going to happen in front of the audience or behind the curtain, and specific requirements such as whether a closet door needs to be hinged on the up- or downstage side. Any information that affects time or fiscal budgets, such as special properties or lighting/costumes/projection/effects that may require extra time or money, also need to be noted.

This type of information is gathered not only from reading the script but also from conferences with other members of the production design team. As with the first and second readings, all of this information needs to be recorded either electronically or the old-fashioned way — on paper.

The Questioning Process

Questioning is one of the keys to creativity. Your drive to create is based to a great extent on your perceived need for change; your creative discontent with the status quo. If you are satisfied with everything in your world, you will see no reason to change, modify, or create anything.

PRODUCTION INSIGHTS

Talk It Over

The most unified production concepts are developed as a result of talking. In a production of *Cabaret* at the University of Arizona, the production design team began preliminary concept discussions in early January for a production that was to open on April 25.

The director indicated at the first meeting that he wanted to stress the decadence of Berlin society. Our initial informal discussions centered on what this decadence should look like. Someone said that the cabaret should appear to be below ground level (to subliminally support the idea of descending into the hell that was about to engulf Germany). Another person mentioned that it could be useful to have four towers onstage with followspots on top, because the audience might make a connection between them and the guard towers in a concentration camp. The director said he wanted to have the cabaret audience watching the onstage action (cabaret and noncabaret scenes) at all times. He thought that this device would add an appropriately voyeuristic quality. Ideas just seemed to pop up as we all became more excited about the project.

Within a month, we developed the production concept through our discussions at these once-a-week meetings. We all brought rough sketches, photos, and ideas to every meeting. We discussed everything — acting style, acting areas, color, visual motifs, atmosphere, history. When the deadline for final designs arrived, we all knew what everyone else was thinking and doing.

This example shows what can happen when the production design team, under the leadership and coordination of the director, works together to evolve the production concept. For a variety of reasons, however, it frequently isn't possible for the director and designers to sit around a table or meet in a video conference and work together in developing the production concept. When this happens, a good director usually adopts a more authoritarian posture in the development of the production concept. He or she develops a primary production concept and discusses it in individual meetings with the designers. The designers then work toward this concept.

The two methods work equally well. Quality productions can be achieved with either method. The common denominator is communication. A good production concept can evolve only if the director and designers talk to one another and share their ideas, thoughts, and imagination.

To analyze effectively it's necessary to shed fear — fear of criticism, fear of making mistakes, fear of seeming less than brilliant, fear of being thought a fool or somehow different. Fear inhibits thinking and makes us afraid to ask questions. All too frequently I hear people say, "I don't want to ask a dumb question, but . . ." As far as I am concerned, the only dumb question is one that isn't asked.

Analyze the script, question the director, question the other members of the production design team, question the producer. Learn what they are thinking, feeling and planning for the production. Analyze what they say. See how it fits with your reactions and thoughts. The more information you receive the more source material you will have to draw on when you finally begin to design.

Research

Research can be subdivided into two separate areas: background research and conceptual research.

Background Research

Designers need to study the historical period of each production they design. This background research involves online searches and perusing the library for books, catalogs, paintings, periodicals, and other sources of information about the era.

PRODUCTION INSIGHTS

How Did It Look?

Visual references are indispensable when trying to determine what something — a person, locale, or object — looks like. Magazines such as *National Geographic* and numerous online sites contain excellent pictures of costumes, furniture, props, and decoration for plays set in the twentieth century. Visual information about earlier eras can be gleaned from paintings, sculpture, and engravings found either online or in art history books.

The ultimate use of these visual references is up to the individual designer. Some designers faithfully reproduce a costume or furniture piece so they can be sure that the "look" is authentic for the desired period. Others study sources and then design something that reflects the general style of the period.

A great deal of historical research can be accomplished online. For example, if you're designing the scenery for a play set in New York City in the late 1800s, you can conduct a search for interior and exterior photos, paintings, and drawings to help develop a comprehension of the look and feel of the period in that particular locale.

While online research is frequently the fastest way of obtaining information, it may not necessarily be the most detailed. Image clarity can be a little fuzzy. Colors can be off a bit. You may be able to get a better feeling for the *detail* of a particular period by spending a few hours in the library browsing through a stack of books looking at pictures and reading the supporting text. During this kind of general library search, you may also discover interesting information and details that a more targeted online search doesn't provide.

Your research can also involve primary sources. If you are designing costumes for a period play and you're lucky enough to live near a museum with a collection of historical clothing of that period, go look at them. See how they were made, think about how you could adapt the line and silhouette of those garments to the needs of your production design. Make notes. Sketch details that interest you. Ditto for scenic design. If you live in an area similar to the locale of the environment for which you're designing, look at buildings and houses constructed during the period of the play. Look and observe. Make notes and sketches.

Your historical research could also include reading about previous productions of the play and *might* include looking at photos, sketches, and models of those prior productions. But don't think that you *must* look at any visual references of prior productions. If you choose to look at them, simply use them as references for one way that the play was once produced. Don't fall prey to the temptation to copy someone else's work. That stifles your own creativity and, more pragmatically, is illegal in most states. While you shouldn't copy someone else's work, you should also be sure that you don't try to create something so original that it blinds you to the playwright's intention. Remember, the root of any viable design is based in the script.

Conceptual Research

Conceptual research involves devising multiple solutions to specific design challenges. When reading a script, for example, you may discover that the heroine

PRODUCTION INSIGHTS

Historical Relevance for Design

Although each designer (scenic, costume, lighting, projections, properties) must look at visual material relevant to his or her design area, all designers (including sound) should also study the history of the period. As an example, the costume designer needs to know the history and style of dress of the era of the play. This study could begin with a look at a text on costume history to get a general understanding of the style of the time. More detailed study will also be necessary. You can look at paintings, photos, museum displays, catalogs, and any other sources that illustrate the fashion of dress for the period.

An understanding of the socioeconomic background of the play's environment is also useful, because clothing styles are usually a reflection of the morals and economics of the time. Throughout the major periods of fashion, there have been subtle, and sometimes not so subtle, shifts of style based on the socioeconomic status of the individual. Servants have rarely dressed like their employers, and it has usually been fairly easy to differentiate between classes based on the cut and quality of their clothes.

Additional research into the arts (painting, sculpture, literature, music) and history of the playwright's era can provide information on the world that shaped the author's thinking. Essays and critical reviews of the playwright's work are another good source of background information.

leaves the stage at the end of Act I in a beautiful gown and reappears at the start of Act II with the same dress in tatters. Your conceptual research would be to figure out as many ways as possible to solve this challenge.

A snag frequently encountered during conceptual research is our apparently natural inability to conceive of any more than two or three possible solutions to any given challenge. Too often our brains go numb and refuse to dream up new ideas. In psychology this type of nonthinking state is referred to as a perceptual block. If the perceptual block is eliminated, our ability to create additional solutions for any challenge is greatly improved.

Incubation

How many times, having left the room after finishing an exam, have you suddenly remembered the answer to a question that eluded you while you were writing the test? How many times have you come up with the solution to a challenge after having "slept on it"? In both of these cases, the information necessary to answer the questions was locked in your subconscious and only needed time and stress reduction to allow the answer to float into your consciousness.

Incubation provides time to let ideas hatch. During this time, you should basically forget about the project. Your subconscious will use the time to sort through the information you've gathered in the previous steps and may construct a solution to the challenge or point you in a valid direction.

PRODUCTION INSIGHTS

Unblocking Your Thinking

How can we get rid of our perceptual blocks? By eliminating the cause we usually eliminate the block. Proper identification of the real challenge is vital. Many times challenges are not what they first seem to be. If a play requires three sets, one of the design challenges would be to devise ways to shift between them. To most of us that would mean finding ways to move the sets. We see sets shifted in this way all the time — it's normal. But couldn't the challenge be solved just as well by putting all three locales on a unit set and shifting the audience's attention by lighting only the part of the set that we want it to see? or by using three separate theatres, each with its own set, and having the audience move? or by having two of the sets hidden behind the upstage wall of the third set and moving sections of the wall to reveal the appropriate set? These additional solutions to the challenge are the result of nothing more than a careful examination of the specific question being posed in the challenge.

Define Your Challenge More Broadly

If you thought about the traditional ways of shifting between sets in the previous problem, you were defining the challenge too closely. By unconsciously limiting your quest to traditionally accepted methods, you were shutting off a whole realm of potentially effective solutions to the challenge. Think creatively about the elements of the challenge, and don't accept only the commonplace answers to the questions posed in the challenge.

Overcome Tunnel Vision

When working on a design it is very easy, and egocentrically convenient, to fall into the trap of not seeing your assignment from the viewpoint of others involved in the challenge. When designing scenery, it is very easy to put a ceiling on the set without worrying about how this is going to affect the lighting design. Similarly, when determining the width of doors to be used on your set, it's easy to forget that the costume designer is planning to use hoop skirts that measure four feet in diameter at the hem.

Tunnel vision can be avoided when members of the production design team discuss ideas and details in production meetings. By conferring on a regular basis, the director and designers can remain aware of everyone else's work as it progresses from conception to completion.

Avoid Visual Stereotyping

Visual stereotyping refers to seeing what you expect to see rather than what is actually in front of you. It limits your ability to conceive of existing elements in new combinations. If you expect to see casters attached to the bottom of a stage wagon, it may be difficult for you to envision turning the casters upside down and attaching them to the stage floor. But that "inverted" thinking may provide an effective solution to the problem of shifting scenery for a complex show when you don't have enough casters to accomplish the task in the more conventional manner.

Remember Details Selectively

People remember things selectively. If we decide that something doesn't have great personal significance, we tend to forget it. To demonstrate this principle try to draw, from memory, a detailed sketch of the front door of your house, apartment, or dorm room. Most people can't do it. We see and use the door several times every day, but most of us never look at it very closely.

All of us remember details that we have determined are important for us to recall. Albert Einstein was reputed not to have known his own telephone number. When asked why, he said that he didn't want to clutter up his mind with information he could look up.

Although it is very important for a designer or technician to have a thorough knowledge of the various subjects that make up his or her field of expertise, it is equally important to follow Einstein's dictum and not clutter up your mind with details that can be found fairly easily online or in a reference book.

Give yourself enough time to let your subconscious mull over the data that you have absorbed. How much time is enough? That depends on the scope of the project and, realistically, the amount of time remaining until the project is due. "Enough time" can be anywhere from a few hours to several days. It isn't possible to do your best work if you wait for the deadline and then rush through the assignment. You are much more likely to produce quality work if you allow time for incubation.

Selection

Selection is the step in the design process in which you sift through all of the data you've accumulated and decide on your specific design concept. Because the choices of each designer affect the work of all members of the production design team, everyone's designs need to be discussed in production meetings.

The scenic designer creates **thumbnail sketches** — either hand- or computer-generated — to explain the scenic concepts for the production (see Figure 2.2). If the sets for the play are complex or the sketches do not fully explain the concepts or if it is the designer's preferred presentation method, a **functional model** of each set idea may be constructed. A virtual model of the set(s) may also be created. Virtual models can be viewed from a variety of angles and help communicate the scenic designer's intentions. If there is a lot of scenic movement — wagons sliding on and off stage, set elements rotating, drops flying in or out, and so forth — an animated presentation can clearly show the scope and timing of those movements.

The scenic designer also provides an indication of the intended color scheme with the thumbnail sketches. This can be done by coloring on them or by accompanying them with color sample cards (paint chips).

The costume designer provides sketches — either hand- or computer-drawn — or pictures of the intended costumes. Although the costume designer normally attaches fabric swatches to the final costume renderings, these preliminary sketches usually require only an indication of the color and type of fabric that will be used (see Figure 2.3).

The lighting designer can submit sketches or computer presentations showing the general characteristics of the concept for the lighting design, if such sketches are appropriate. Normally he or she presents the intended palette and a verbal description of the atmospheric effect of the lighting during the production meeting.

The projection designer typically presents sketches, photos, and/or videos or computer visualizations of what the projections will look like and explains how they will be integrated into the production.

The sound designer discusses the sound scoring — the types of background and specific sound and musical effects — as well as an overview of the required

PRODUCTION INSIGHTS

The Gobo Trick

A lot of art is the result of happy accident. While sitting in the auditorium during technical rehearsals for some forgotten production, I noticed that one area of the stage floor seemed to have a rough texture. I went up on stage and looked more closely. The floor didn't have any texture; it was painted a smooth, flat color. Then I looked up at the lights. One of the instruments had a gobo (a thin metal template that creates a shadow pattern) left in it from a previous production. That instrument was creating the texture. Although I took the gobo out of the instrument, I remembered the effect. Now whenever I want to create a textured atmosphere I put gobos in the instruments.

The moral? Always evaluate what you've done, even if you think it's a "mistake." Just because something isn't right for one situation doesn't mean it won't be right for another.

thumbnail sketch: A small, quick, rough drawing, usually done in pencil, that shows the major outline, character, and feeling of the object but does not have much detail.

functional model: A three-dimensional thumbnail sketch of the scenic design; normally built on a scale of ½ or ¼ inch to 1 foot; usually made from illustration board, Bristol board, file folders, or similar cardboard; also known as a white model.

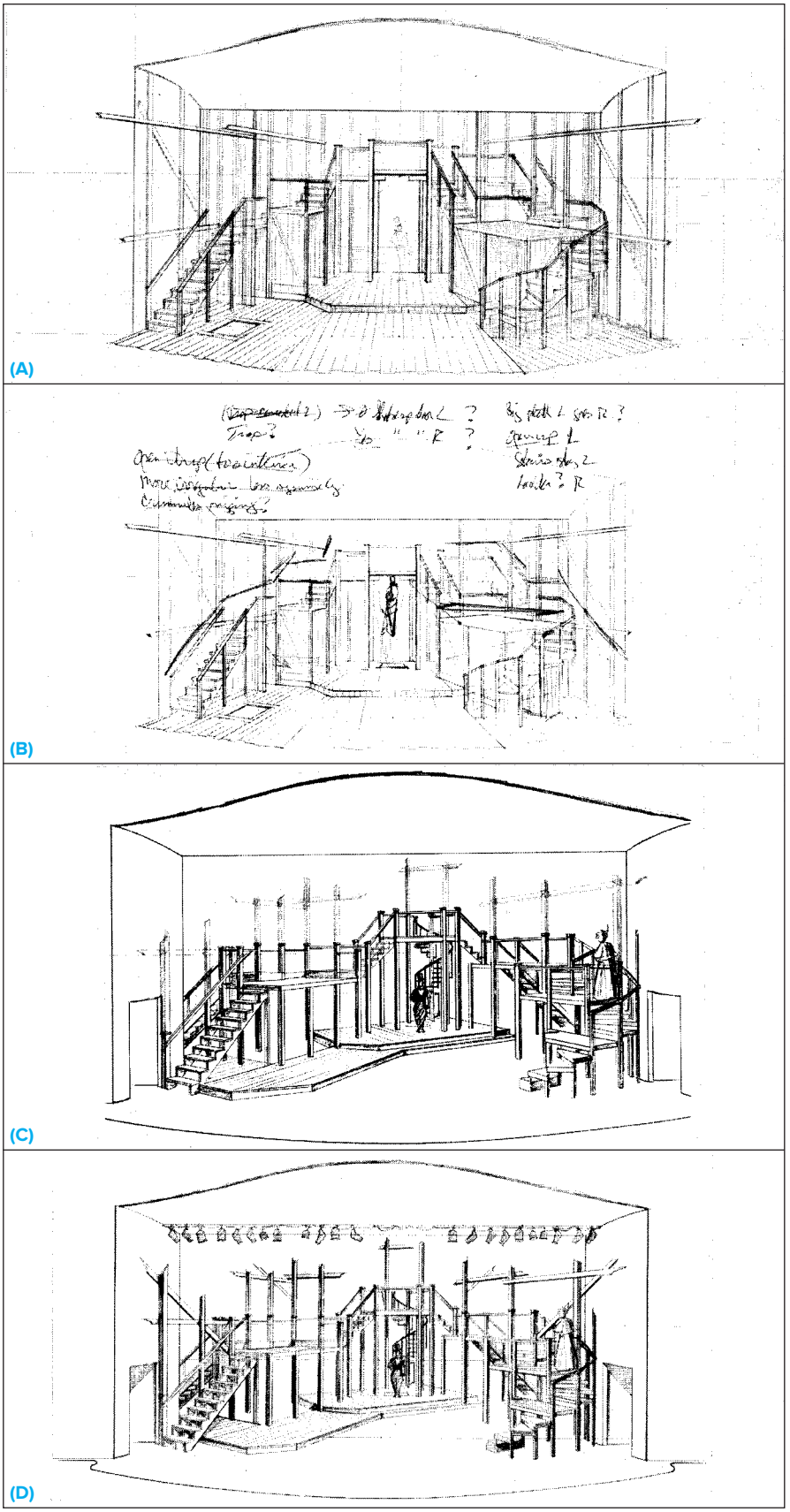


FIGURE 2.2
Thumbnail sketches for the University of Arizona Department of Drama's production of *Nicholas Nickleby,* scenic design by Tom Benson, directed by Harold Dixon and Dianne Winslow. The first sketch (A) shows a basically symmetrical platform arrangement flowing from the upstage center high point down toward the edges of the proscenium. The set has an elaborate gridwork behind the platforms and a planked wooden floor. (B) The directors and designer made notes and sketches on a copy of the design as they discussed modifications to the set. (C) The stage right platforms were then opened to make the space underneath more usable, and the downstage left staircase was curled further onto the stage, making the set asymmetrical and more dynamic. The background gridwork was also abstracted, and the planked floor was eliminated to make the central floor more visually useful. In the final sketch (D), some of the background gridwork was angled to create a more dynamic line, and the lighting instruments were included as a scenic element.

FIGURE 2.3
The costume designer uses preliminary pencil sketches as a visual notebook to record ideas that may ultimately find their way into a finished costume design. Preliminary costume designs by Peggy Kellner for *Macbeth*, produced at the Old Globe Theatre, San Diego, California. Courtesy of Peggy Kellner.

sound reinforcement equipment and perhaps the location and function of the various amplifiers, mixers, and speaker setups.

The selection phase of the design process is finished when the director feels satisfied that the plans from each of the design areas support the production design concept.

Implementation

The implementation phase begins when you stop planning and start doing. At this time the designers produce the drawings, plans, and instructions necessary to construct the scenic, lighting, costume, and sound designs.

The scenic designer makes the final color renderings for each set of the production and, if necessary, constructs **production models** of the sets. He or she also drafts the scale drawings that describe how the set should look (see Figure 2.4). After completing the paperwork for the design, the scenic designer monitors the progress of the construction of the set(s) and properties to make sure that they are completed according to plan, on time, and within budget.

The lighting designer draws the light plot as well as the other paperwork associated with the lighting design (see Figure 2.5). He or she then supervises the hanging and focusing of the lights and determines the intensity levels and timing for all lighting cues.

production model: A scale model similar to the functional model but fully painted and complete with all furniture and decorative props.

sound plot: A list describing each sound cue in the production.

The costume designer produces colored renderings for each costume, complete with notes and sketches that fully describe any accessories (see Figure 2.6). Fabric samples and trims are attached to each sketch to indicate the fabrics and materials to be used. These designs are turned over to the costume shop. The costume designer maintains close contact with the shop to determine that the costumes are being built as planned and will be completed on time and within budget.

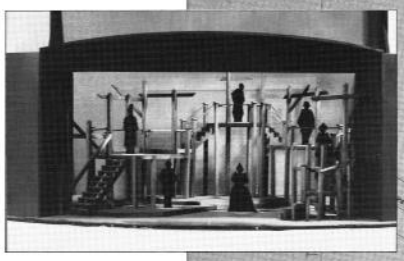
The projection designer acquires and/or creates the still and/or video images to be used during the production, acquires the necessary projection equipment, and supervises the equipment's installation in the theatre and the setting and timing of all the projection cues.

The sound designer completes the **sound plot**, gathers and records the various musical and effects cues, and assembles the necessary reinforcement and playback equipment and speaker systems. During the technical and dress rehearsals, the sound designer determines the appropriate loudness levels for each sound cue and does any necessary re-recording and re-editing.

During implementation the technical director makes necessary adjustments to and then finalizes the production calendar, makes all necessary construction drawings, orders materials for construction of the sets and props, organizes the crews, and begins construction.

During rehearsals the director's view of the production concept usually evolves. Minor changes should be expected. Production meetings held during

FIGURE 2.4
Finished scenic design for *Nicholas Nickleby.* (A) The production model, (B) the ground plan, (C) some construction drawings. Courtesy of Tom Benson Scenic Design.



(A)

(B)

(*continued*)