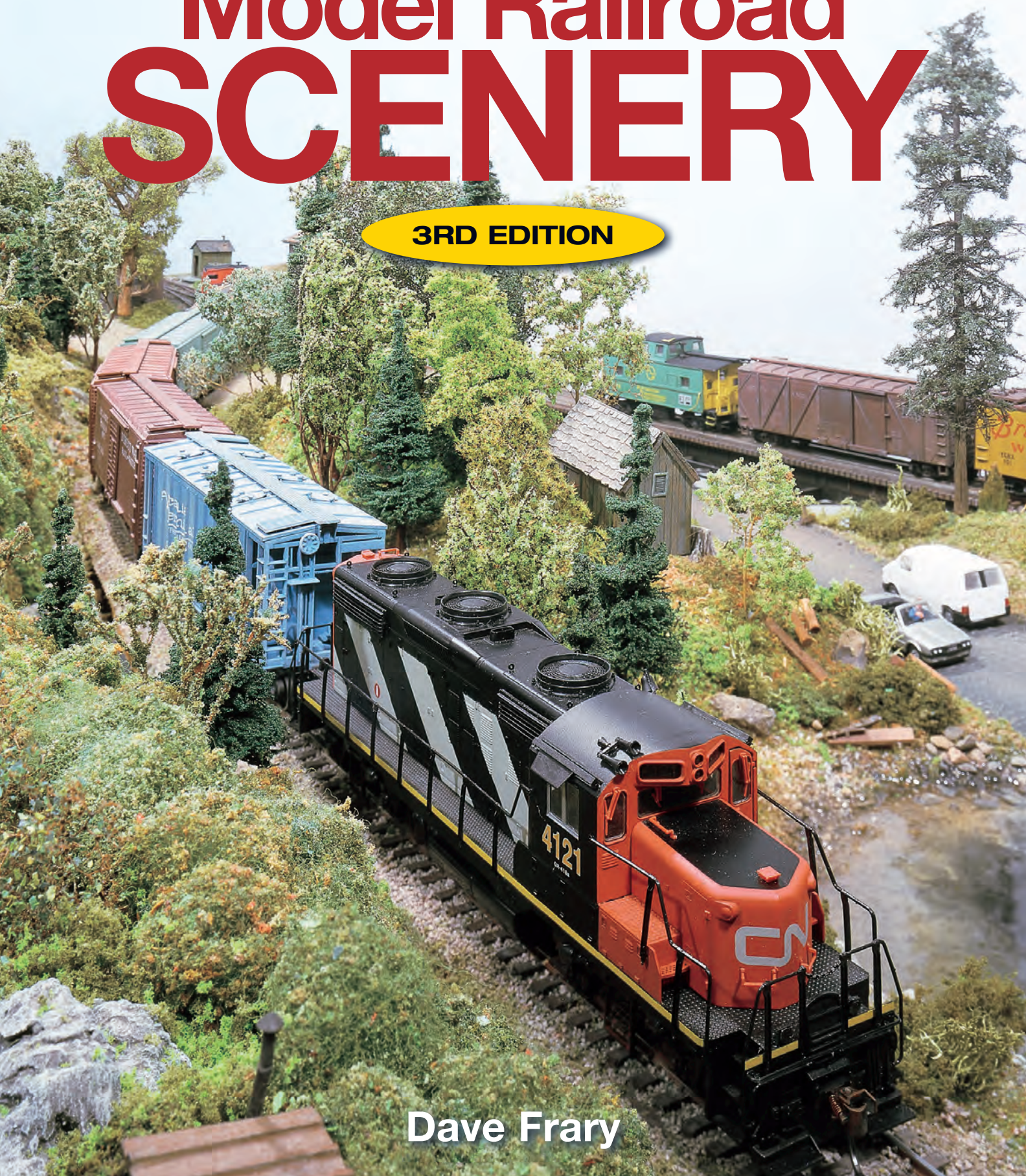


**Model
Railroader**
BOOKS

HOW TO BUILD REALISTIC Model Railroad SCENERY

3RD EDITION

Dave Frary



About the author

Dave Frary has been an active model railroader for over 45 years. He's best known for his scenery-building articles, hands-on clinics, and hundreds of photos that have appeared in *Model Railroader*, *Classic Toy Trains*, *FineScale Modeler*, *Great Model Railroads*, *Railroad Model Craftsman*, *Model Railroading*, *Maine 2-Foot Modeler*, and many other publications.



Dave is a professional scenery builder. His other interests include competition barbecue cooking, lobster fishing, and travel. He has produced four scenery and weathering programs in the *Trackside Modeler* video series, now available on DVD. More information on Dave's books and videos can be found on his website at www.mrscenery.com. Dave has authored six books for Kalmbach Publishing Co., including earlier editions of *How to Build Realistic Model Railroad Scenery* and *222 Tips for Building Model Railroad Structures*.

How to Build Realistic Model Railroad Scenery

Third Edition

Dave Frary



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Dedication and acknowledgments	4
Introduction	5
Chapter 1: Planning your scenery	7
Chapter 2: Building scenic forms	13
Chapter 3: Basic colors, textures, and adhesives	31
Chapter 4: Rocks and rubble	41
Chapter 5: Finishing: texture	59
Chapter 6: Trees and foliage	69
Chapter 7: Modeling water	86
Chapter 8: Backdrops and background scenery	98
Chapter 9: Foreground scenery	112
Chapter 10: Modeling the changing seasons	126
Chapter 11: Ballasting track	134
Chapter 12: Rejuvenating old scenery	138
List of products, manufacturers, and suppliers	142
Index	144

Dedication and acknowledgments

When the first edition of this book was published back in 1982, I introduced the “water-soluble method” of scenery construction. Water-based paints and adhesives were coming into their own at the time, so I borrowed a few techniques from others, developed many myself, and experimented with water-soluble materials until I developed a foolproof, repeatable method of scenery building. But no system is perfect.

The water-soluble method received wide acceptance and was put into practice by modelers around the world. Many readers took the time to write to me with new ideas, suggestions, and corrections, or to explain how a formula or material might be improved. To these folks, I dedicate this book.

My sincere thanks to all of you for helping me make this third edition a better book and for helping future generations of modelers to build better scenery.

Also, thanks to my friends and fellow modelers for sharing their ideas and answering all my dumb questions: Bob Hayden, Dave Maynard, John Olson, Hal Reynolds, and George Sellios. Thank you all!

A note on the photos in this book

In the 15 years since the second edition of *How to Build Realistic Model Railroad Scenery* came out, I've built scenery on many model railroads for customers all over the world. Many of the photos used in this book are a collaborative effort of artists, scenic builders, and model railroad owners.

My sincere thanks to the following friends and customers: Carl Chancey, Joe Galdi, Don Holloway, Steve McKeon (scenery built by Bob Hayden), Tom Piccirillo, Alan Rieper, Dick Rotto, and Dave Willis.

And my thanks to the scenic artists who helped make everything look great: Jim Vogel, artist; Mark Grunow, artist; and Carol Vreeland, tree builder, Sterling Models.



The scenery-building techniques described in this book can be applied to any model railroad, regardless of scale or gauge. Here's Carl Chancey's high rail layout finished with realistic rail yard scenery.

Introduction:

What this book is about

This third edition of *How to Build Realistic Model Railroad Scenery* is about building great-looking model railroad scenery without experimentation or guesswork. It's short on theory and long on technique. I'll show you fast and easy ways to build realistic scenes and dioramas using my integrated water-soluble system.

The water-soluble system has been developed over 45 years of amateur and professional scenery building. As the name suggests, the water-soluble system almost exclusively uses materials that can be mixed, thinned, and cleaned up with water. There are no messy chemicals, fumes, or special thinners to worry about, and cleanup is fast and easy. I've kept track of the techniques, methods, and materials that work. Most materials are fully compatible with one another: This means you can start and finish a section of your scenery before the scenic shell has had a chance to dry. Or you can build scenery at a much more leisurely pace. It's up to you.



Author Dave Frary brings more than 45 years of amateur and professional model railroad scenery building experience to this third edition of *How to Build Realistic Model Railroad Scenery*. Modelers the world over have used his water-soluble scenery building techniques to build better, more realistic layouts.

My approach to presenting these techniques follows a simple format. I give you the formulas that have worked for me and for thousands of other scenery builders. Your job is to take the recipes and use them—or, better yet, improve upon them—to achieve results that please you.

Step-by-step information in the following pages is presented in a straightforward, methodical, mainly chronological order. Many of the formulas, mixing guides, and techniques are presented in sidebars, with bullet-point lists for the painting and coloring mixtures.

Compared to scratchbuilding a structure or fine-tuning a locomotive, building scenery is the easiest, most relaxing aspect of model railroad construction. So let's get started building realistic model railroad scenery!

About the images

Digital photography has finally come of age in the publishing world. Most of the photos in this third edition are digital. I used a Nikon 950 and a Fuji S-2 Finepix with Nikon lenses to shoot them and lit most with Dyna-lite electronic flashes or tungsten lamps.



A good scenery plan should contain the necessary information to build an attractive, visually interesting model railroad that will provide a lifetime of pleasure. Dick Rotto layout

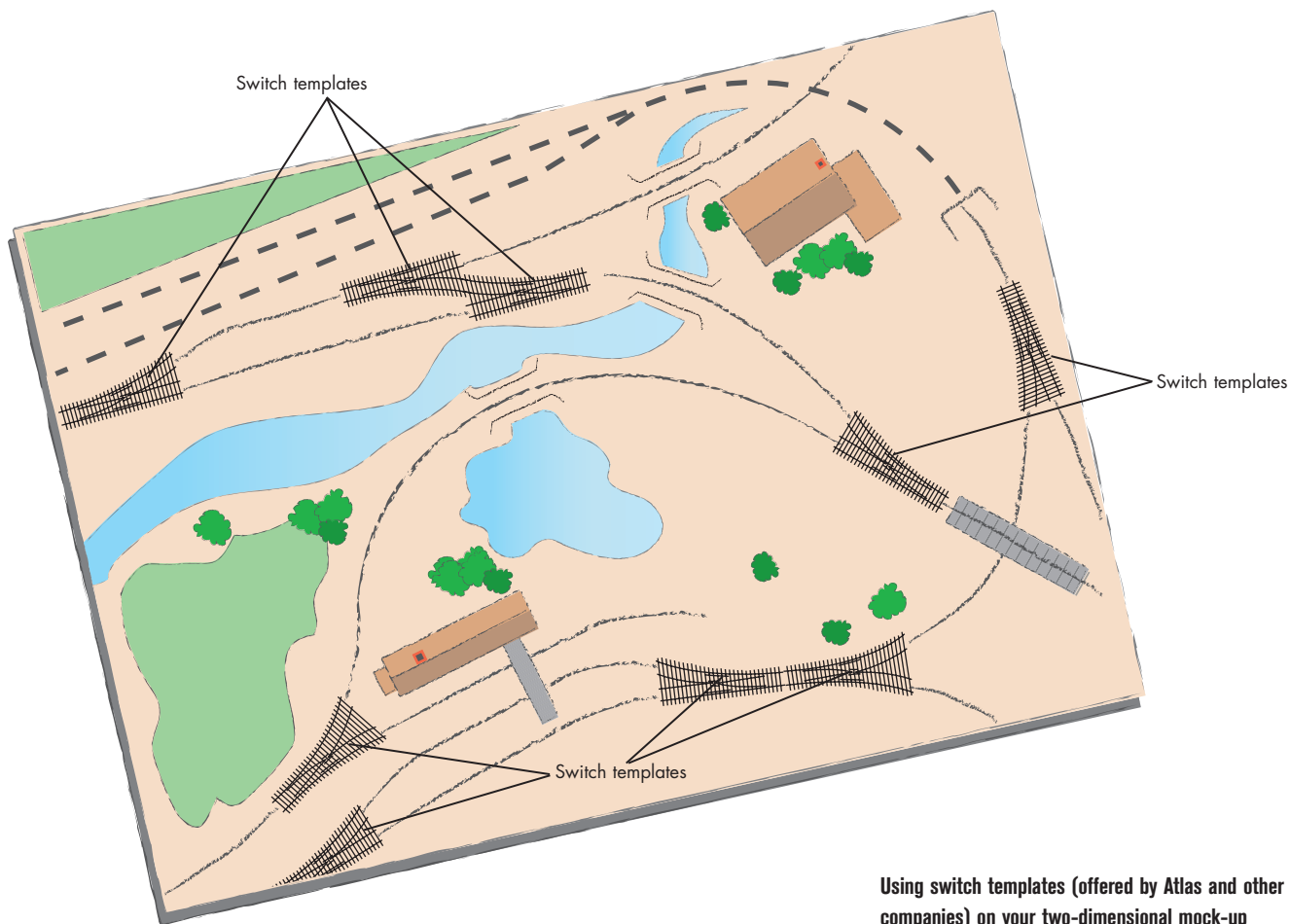
Planning your scenery

Before you start building scenery, you'll need a plan. A good plan will help you build a model railroad that you'll enjoy for a long time. You should have a place for your railroad that's clean, warm, and large enough for your plans.

No matter how large or small your space, you can design a layout that will fit in and provide plenty of enjoyment.

Next, you'll need a track plan that expresses your modeling goals. It can be based upon your favorite prototype railroad or freelanced from photos and ideas you've collected. Many books on designing and operating model railroads are available to provide valuable reference information (visit www.kalmbachbooks.com).

While you're designing the track plan, think about scenery elements you'd like to include. If you're modeling a specific prototype, list the scenery features that make it unique. Jot down "must have" items and don't forget to list all the little details you've noticed in photos. This should become your checklist of items to include as you think about your scenic plan.



Using switch templates (offered by Atlas and other companies) on your two-dimensional mock-up during layout planning will help assure correct track spacing.



A warm, comfortable place to build a model railroad will allow you to do your best work. This room has a sealed concrete floor, painted walls, recessed lighting, and its own heating and air-conditioning system. The next step here is to start laying track. Dick Rotto layout

Several years ago, I built a waterfront module modeled after an area of the Maine coast that I love to visit. The track plan was lifted from a survey map of the rail line. The track and the town it serviced had to be compressed and

shortened, but I retained most of the scenic features. They were important because they helped establish the module as a miniature chunk of Maine.

I started by selecting locomotives and rolling stock and lettered them "Maine

Central." All the structures were scratchbuilt or came from kits that I modified to look like photos of area buildings. I matched soil and rock colors, as well as trees that would suggest the Eastern white pines found along the coast.

Then I referred to my checklist and selected or built details, such as lobster pots, fish boxes, boats, pilings, seagulls, and telephone poles. And last, I photographed signs from the area, scanned the images into a computer illustration program, and reduced them to a scale that could be printed and glued to the buildings. It worked, and the scene shouted "Maine" to everyone who viewed it.

Two-dimensional mock-up

Many folks find it easier to judge how scenery will look if they can see it full size. This is easy on a small layout or module: Just unroll a sheet of banquet table paper or brown wrapping paper

MEASURING

To obtain repeatable results when you build scenery, you must observe a few simple measuring procedures. When adding ingredients to a measuring cup, be sure no air pockets are trapped inside the cup and the ingredients are level with the top.

A “regular spoonful” means the ingredients in it should be rounded, but a “level teaspoon” means the ingredients are even with the top of the spoon. When using kitchen measuring spoons, be sure all measurements are level with the top.

There are several places in this book where I mention using a “heaping cupful.” This means you scoop up a full cup of the ingredients, letting the cup hold all it can.

When using tube-type acrylics, determine the correct amount by measuring the length of paint squeezed from the tube. The best way to do this is to mark the flat side of a tongue depressor with lines 1”, 2”, and 3” from one end. Squeeze the acrylic onto the flat part of the depressor starting on the correct line, and use the tip of the depressor to separate the paint from the spout.

The smallest measurement I use is the drop. Drops should always be measured with an eyedropper so each is uniform. Eyedroppers are available at pharmacies and hobby shops. Count the drops as they fall, and always wash the eyedropper immediately after using it.

and cut it to size. You may have to cut several pieces and tape them together for an odd-shaped layout. If the layout is flat, lay the paper on top of it.

Using flex track sections and turnouts as guides, trace around the edges to establish track placement. If you know the kit structures you’d like to use, check the Walthers catalog for the size of the footprint. I make full-sized cardboard footprints (with the name of the structure, its manufacturer, and catalog number written on each one) so I can move them around to see where they’ll fit and look best.



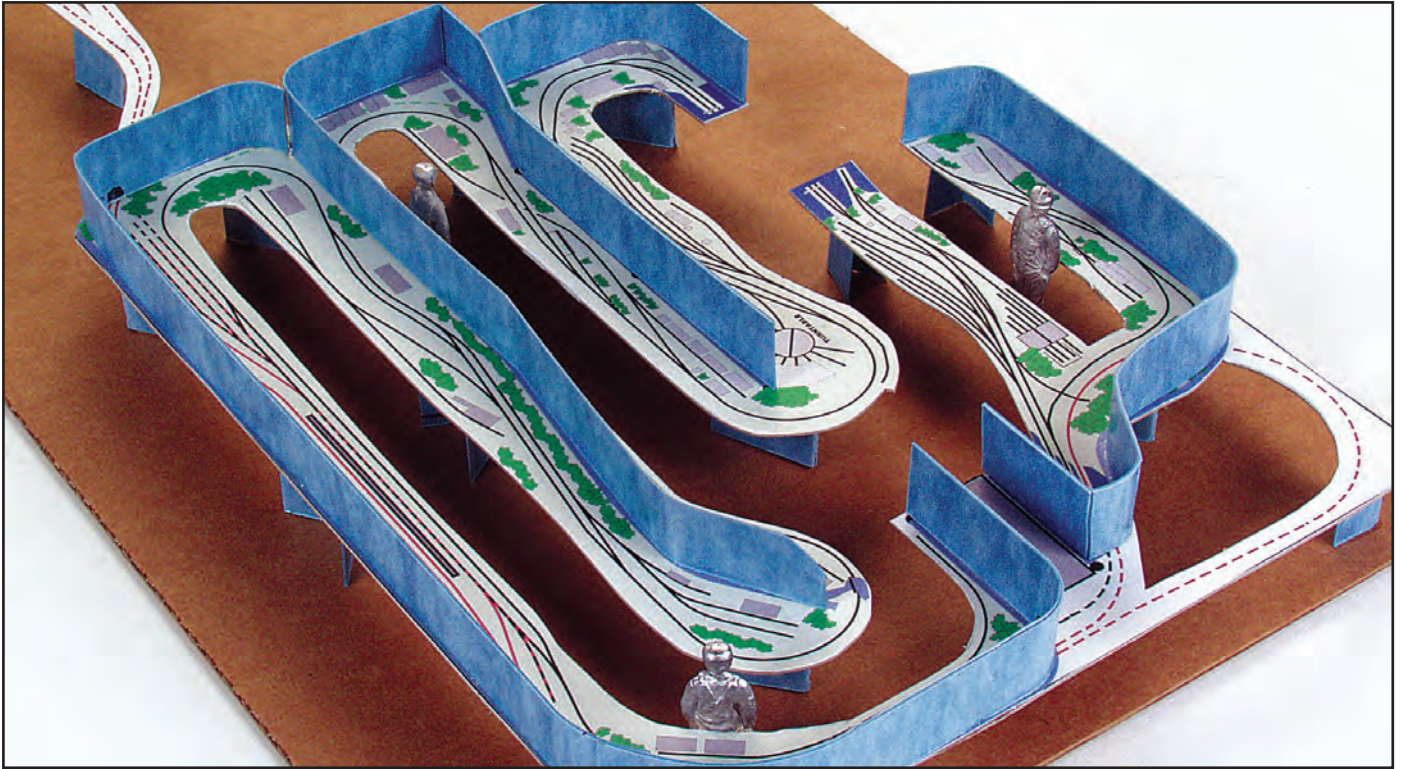
A good plan requires plenty of reference photos. When you’re miles away from the prototype and trying to match the look and the color of the scenery, photos are invaluable resources. Dick Rotto layout



Hundreds of photos were used to duplicate the scenery of the Southwest in this layout. This section of the railroad is being built using both photos taken in the field and pictures found in books. Dick Rotto layout



Even the best plans are sometimes changed. Scenery is the easiest part of the railroad to modify—if it’s constructed using the cardboard-strips and plaster-cloth method described in the next chapter. Here, a new rock formation is being added where a hill once stood. Joe Galdi layout



Here's a very simple planning model made with a computer printout of the track plan and strips of colored paper and cardboard. A plan like this one is useful for checking to make sure the curves fit and the train operators have enough aisle room. Tom Piccirillo photo



Here's a 3" scale planning model on its own scale benchwork. The Ken doll is just the right size to show how real people will relate to the full-sized layout when it is finished.

After you have determined the rough structure placement, start drawing in scenic features. Work from your checklist to ensure that you include all the signature items. Add mountains, streams, waterfalls, and roads, keeping in mind that nothing is written in stone. If you don't like an area, cut out that section of paper, tape in a new piece, and start again.

After a while, roll up the paper and put it away. Wait several days and revisit it with fresh eyes. If it still looks good, you have a solid scenery guide to work from.

Planning models

A model of a model? Sure. For many projects, I've built a model of the model railroad so I could see if the layout had the visual impact, viewing angles, and theme that I wanted. The planning model is also a great tool for showing other folks in order to get their ideas and suggestions.

The planning model can be as simple as a printed track plan glued to a sheet of cardboard. I cut out the track and raise it to scale height, using bits of cardboard as risers. The model can be simple, or you can make it fancy by adding a blue paper



This planning model was built to show a movie art director how a small HO layout would look when it was completed. The structures on the model were repositioned many times before the full-sized model railroad was built.

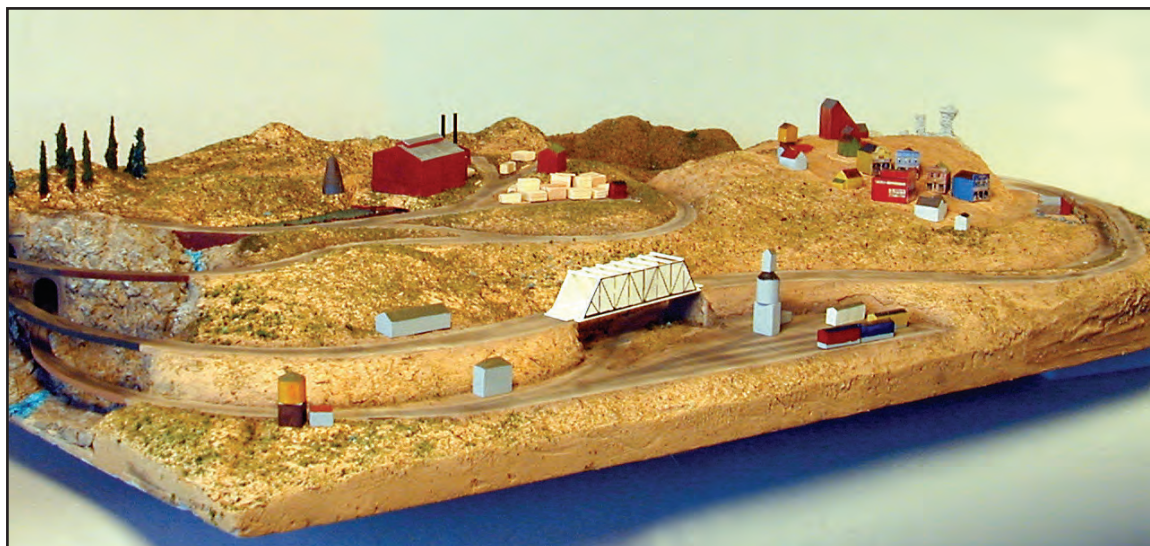
backdrop, scale people, and even surrounding walls. Scenic shapes can be added using modeling clay (be careful, some brands are very oily) or such commercial alternatives as Fimo®, Play-Doh®, or Sculpey® (sold in craft stores).

If you're more ambitious, try building a three-dimensional planning model to show track and scenery. This can help you and others visualize how the finished layout will look. I like these models to be big—usually $\frac{1}{8}$ scale (2" equals 1')—which is large enough to show details yet small enough to pack and carry to show friends or customers. In this scale, a Barbie or Ken doll alongside the model provides a feel for how full-sized people will relate to the scenes.

I use a block of Styrofoam as a base for these models and glue the track plan to the surface. Structures are represented with colored wood blocks wrapped with a computer-generated image of the real structure printed out on paper. Coarse green scenic foam serves as foliage. I also like to make paper profile boards around the sides of the model layout to give it a more finished appearance.



This planning model is under construction. The low lighting angle shows off the textured surface created by using Sculptamold to model the terrain.



This model of a model railroad was built on a flat piece of Styrofoam using a paper printout for the track diagram. The hills and mountains were modeled using Sculptamold. The structures are blocks of painted wood.

TOOLS, MATERIALS, & STANDARD MEASURES

The following items are the most important tools and materials you'll need to build scenery. Most of them can be purchased as you need them. If you can't locate a particular item, don't be afraid to substitute something similar; it'll probably work just as well. Don't worry if you don't know what some of these items are yet: I'll be discussing them in the following chapters.

Tools

- Artist brushes, size 00 to 1" wide
- Awl or ice pick
- Box cutter and extra blades
- Carpenter's square
- China-bristle brushes, 1" to 2½" wide
- Clamp-type stapler with ⅜" staples
- Eyedroppers
- Funnel
- Hobby knife with no. 11 blades
- Hot glue gun with low-temperature glue sticks
- Kitchen measuring spoons
- Latex gloves
- Matte knives with extra blades
- Measuring cup
- Pallet knives
- Plastic mixing bowls
- Pump-type spray bottles
- Putty knife
- Rubber kitchen spatula
- Scissors
- Serrated paring knife, 4" long
- Small level or line level
- Snap-type clothes pins (optional)

- Staple gun
- Steel straightedge
- Tape measure
- Tweezers, long and short
- Vacuum cleaner

Materials

- Baseball diamond clay-like dirt, baked and sifted
- Corrugated cardboard, cut to strips 1½"-wide
- Dirt and earth texture, screened, and baked to kill insects
- Foam core board, ¼" thick
- Gallon plastic jugs for water
- Gauze pads or rolls
- Heavy-duty paper towels
- Large coffee cans with plastic lids
- Newspaper
- Paper towels
- Pickle jars, wide mouth to fit a 2" brush, with lids
- Plaster (molding or patching) or Hydrocal®
- Plaster cloth, Plaster Wrap®, or Rigid Wrap®.
- Scenic foam in various textures and colors
- Scotch Safe-Release® painter's masking tape no. 2090 (blue tape)
- Sculptamold®
- Styrofoam, 1" and 2" thickness
- Wetting agent or liquid detergent (Kodak Photo-Flo® or Joy® dish detergent)
- White glue
- Woodland Scenics Poly Fiber

Paints (artist or school-grade acrylic unless noted otherwise)

- Acrylic gloss gel
- Black
- Burnt sienna
- Burnt umber
- Cerulean blue
- Earth-colored flat interior wall paint
- Flat black interior wall paint
- Gloss medium
- High gloss acrylic varnish
- Matte medium
- Medium green
- Raw sienna
- Red oxide
- Raw umber
- Titanium white
- Yellow

Miscellaneous

- Dustpan and brush
- Extension cords
- Marking pens
- Plastic painter's drop cloth
- Plastic trash bags
- Three-step ladder or stool

You probably already have many of these materials at home. Many can be purchased at craft stores, hobby shops, or art supply houses. Special modeling and scenery products will be mentioned throughout this book as they are needed.



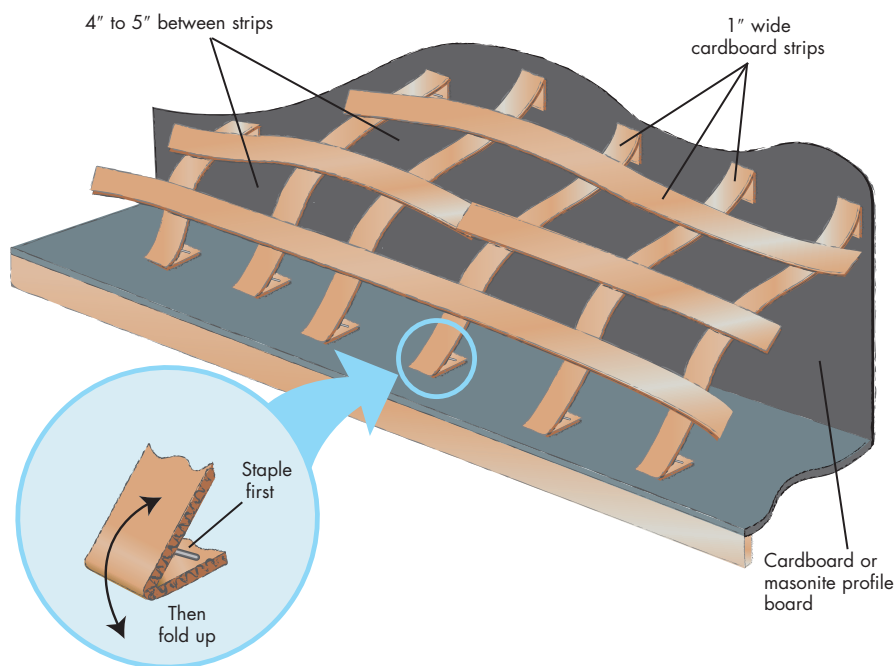
Underneath the extensive mountain range on Joe Galdi's layout is a supporting web of cardboard strips stapled and hot-glued together.

Building scenic forms

Once you've worked out your scenery plan, make sure your layout's trackwork and wiring are complete and the trains run perfectly before you build anything. It's difficult to remove, replace, or repair track after scenery is in place. Ripping up and replacing newly built scenery to make repairs is no fun; a little testing and checking beforehand will save you a lot of headaches down the line.

Scenery has three basic characteristics: form, color, and texture. We'll cover color and texture in the next three chapters. In this chapter, we're going to talk about the first step in scenery building: Erecting a framework and constructing a three-dimensional shell over it to provide form—your scenery's basic contours.

The shell should be easy to build, but it also needs to be stable, strong, and preferably lightweight. It doesn't have to be sturdy enough to support the weight of a person, but it does have to support its own weight and the weight of the scale forests or structures on top of it, as well as an occasional bump or stray elbow. The surface of the finished shell should also be able to hold texture and paint well.



The cardboard-strip method of building a scenic shell is fast and easy; the raw materials are readily available—usually for free.



Because the walls of this canyon will be covered with rock castings, the cardboard-strip web is all that's needed for support. Note the temporary workbench made by screwing a small square of plywood to the benchwork. Joe Galdi layout



Construction of the scenery base starts by stapling or hot-gluing vertical cardboard strips to the flat base. Horizontal strips will be added later.



The strips can be bent, folded, and shaped to create almost any scenery contour. Here they're being flexed to make a gentle slope; they'll be hot-glued to the Styrofoam backing later on.

I've been involved in projects that used many materials: plaster troweled over wire screen, plaster-soaked paper towels draped over cardboard webbing, carved plastic foam (i.e., Styrofoam), fiberglass over metal screening, and even polyurethane foam sprayed over a wood frame covered with chicken wire. Any of these materials will make a good scenic base, so experiment and pick the method you prefer. As we look at each of these techniques in this chapter, I'll tell you my favorites, but it's up to you to determine which works best for you.

Plaster over wire screen

When I started building scenery, I used the method almost every model railroader used at the time: plaster over wire screen. Wire screening is formed into domes and valleys and tacked onto a wooden frame. The frame is sometimes an extension of the layout framing. For larger projects, a new frame may be built just to support the wire.

After the screen is fastened in place, plaster is troweled over it. This method makes a strong, substantial scenic base. Plaster is easy to paint, and rocks can be carved into the surface while the basic form is damp.

Some modelers like the plaster-and-screen method because it produces durable scenery from inexpensive, easy-to-find materials. It's also pretty easy to learn, so beginning modelers generally have good success with this technique.

The downside of plaster-over-screen scenery is that it's heavy and hard to alter after it's built. You also have to work fast because you have just about 10 minutes before the plaster starts setting up. I don't like the sharp, pointed edges of the wire screen; I still bear scars from my early scenery projects!

Cardboard strip method

For most projects nowadays, I use cardboard strips covered with plaster cloth because it's the easiest method. It works similarly to the wire screen method—without the sharp edges. I first experimented with the cardboard strip technique 40 years ago to build the scenic shell on my first "real" layout. It produces a scenic shell that's strong,

simple to build, and easy to alter later on. It's also economical if you're building a layout on a budget.

The underlying web of corrugated cardboard is light, rigid, and strong. It holds its shape even after several layers of plaster cloth are laid over it. The raw materials are readily available: If you don't already have a bunch of empty boxes in your basement or garage, corrugated cardboard is usually free for the asking at grocery stores. You don't need specialized tools to cut, form, or fasten cardboard. The scenery is hollow, so you can use the interior space to store modeling supplies. The open construction also allows access to switch machines and other mechanical devices that must be located beneath the surface of the railroad.

Making cardboard strips

Any corrugated cardboard box can be used to make cardboard strips. I use a metal straightedge and a box cutter to produce strips 1" to 1½" wide and as long as possible. Cut across the grain of the corrugations to make the strips flexible. To speed up the process, you can cut the strips on a large paper cutter or by running flat pieces of cardboard through a bandsaw (wear eye protection and watch your fingers!). When you get set up for cutting, make a lot of strips, so you'll have enough for the entire project.

You can also purchase precut cardboard strips from Micro-Mark. For more information, look at the List of Products, Manufacturers, and Suppliers at the back of this book.

Building the cardboard web

The next step is to anchor the strips to your benchwork and create a web in the rough shape of the scenic form. The web is a crisscross of strips that have been bent, folded, and shaped into the scenic contour desired. The strips can be fastened with hot glue, staples, or white glue held in place with clothespins until it sets. I trim them to length with scissors after they're in place.

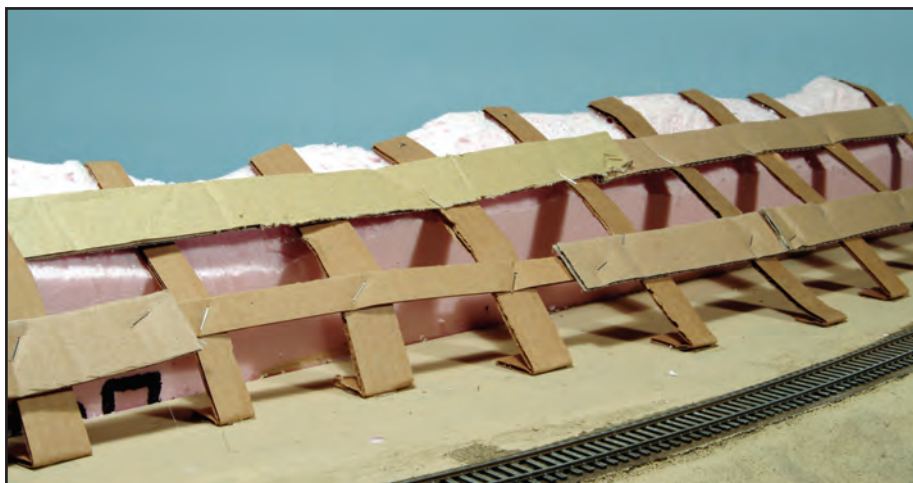
Before you fasten the strips to the layout, run each one between your fingers to make the strips flexible. Wear gloves because the cardboard can give you a nasty paper cut.



There's no limit to the size of a cardboard-strip base. Just keep adding more strips to expand the scenic base until you have the underlying structure you need for your layout.



A handy tool for securing intersecting cardboard strips is a clamp-type stapler. Get one with jaws wide enough to accept two layers of cardboard.



Here is a completed web for a trackside embankment. The vertical strips are hot-glued to the base, and the crossing strips are stapled to the verticals.



As you construct the scenic shapes, remember to put your structures in place to see how they'll look. After the rough scenery was built, the author decided to add a road to serve this structure. Joe Galdi layout

WORKING WITH PLASTER

Plaster is still the preferred scenery building material for many modelers, especially for large projects, because it's inexpensive and available at most building-supply and home-center stores. The downside to plaster is that it's messy to use, sets quickly, and is heavy, even when applied in thin layers.

I still use plaster to make rock and wall castings in latex molds. Nothing duplicates detail in molds like plaster.

HydroCal has become the de facto standard for model railroad scenery applications. It's basically a refined form of plaster that is equally inexpensive and quick-setting but extremely strong. One problem is that HydroCal can sometimes be hard to find. I have substituted molding plaster for HydroCal with equally good results. I've also had similar success with plaster of paris and patching plaster.

People always ask me, "What type of plaster should I use to build scenery?" My recommendation is "any type you can find that's fresh." Plaster loses its hardening properties if stored for a long time in damp

conditions. The plaster absorbs moisture from the air and starts to hydrate in the package. When you mix old plaster with water, only a portion of it combines with the water (hydrates) and hardens. The rest will stay crumbly, making the end product—your layout's scenery base—much weaker.

Mixing plaster

1. Measure 2 cups of cold water into a flexible plastic container.
2. Add coloring, if used (see below). Mix thoroughly.
3. Slowly add 2 cups of plaster. Let the water absorb the plaster.
4. Stir until smooth. Try not to beat in air bubbles while stirring. Stir the plaster slowly and gently until it starts to thicken (about 2 minutes).
5. Use immediately.

Harder plaster

1. Measure 1¾ cups of cold water into a flexible plastic container.
2. Add ¼ cup (or less) white glue to the water and mix thoroughly.

3. Add coloring, if used. Mix thoroughly.
4. Slowly stir in 2 cups of plaster.
5. Stir until smooth.
6. Use immediately.

To retard setting time, use ice-cold water.

Coloring plaster

While coloring plaster sounds like a good idea, remember that any substances added to plaster will weaken it. I've had some success with rock powders sold for coloring cement. Small amounts of acrylic paints will also work. If you color plaster, remember that the color will be much lighter after the plaster hardens.

Universal tinting colors may be the best option because they're just concentrated color with no additives or binders. I mixed a batch of brown plaster for a project by adding several drops of burnt umber tinting color to 2 cups of cold water. After it was mixed completely, 2 cups of plaster were slowly blended in. The result was a soft brown casting that seemed to be just as strong as castings without the tinting color.



One trick for determining how scenery will look before it's built is to cut and install cardboard profiles. In this case, the author wanted to see how steep rocks would fit next to the river, which will be built alongside the track. Joe Galdi layout

You can fasten the strips to any part of the frame or benchwork as long as they don't interfere with the tracks or trains. Start the scenery at one end of the layout, in the middle, or anywhere in between—it's up to you.

Begin by fastening strips to the edge of the track bed and extending them vertically. Use about 1" of the strip for anchoring it to the layout. Put a drop of hot glue on the strip, or hold it in place with a staple.

Attach the strips along the edge of the track bed at 4" to 6" intervals. The free ends of the strips can be attached anywhere; just remember to bend each strip to form the contour of the scenic element before securing it in place. If a strip is too short, staple or glue another one to the end. Placing the strips reminds me of basket weaving, but there's no need to interlace the cardboard.

After the vertical strips are in place, add the horizontal strips. These are also

spaced at 4" to 6" intervals and formed to the scenery contour. Fasten the horizontal strips to the vertical strips wherever they cross. A hand-held clamp-type stapler is great for this and speeds up construction considerably.

Installing tunnel portals

Now is the time to install tunnel portals on the layout. You'll have plenty of access before all the strips are in place. Start by selecting the portals you want to use and paint them. You don't need a finished paint job at this point, just a base color. I use gray automotive primer from a spray can for concrete portals. After the color dries, attach cardboard "wings" to the rear sides and top of the portal. These will be used to attach cardboard strips after the portal is glued in place.

At this point I paint the rail and ballast the track for several feet into the tunnel. For more information on ballasting, see Chapter 11.

Next, assemble and paint the tunnel interior liners (see illustration on page 18). These can be cardboard pieces cut to be the same height as the inside of the tunnel portal and as long as needed to block the view. I've also used 1"-thick bead board (discussed on page 27), Styrofoam sheets, painted rock castings cut to fit, and liners made from sheets of wood or styrene.

The liners can be mounted on and glued to supports made from 2½"-wide strips of cardboard hot-glued to the underside of the track bed, allowing 2" to protrude from either side. Paint cement liners with equal parts of earth and flat black interior paint before attaching them (more in Chapter 3).

The liner should look like the inside of the tunnel and prevent visitors from peeking behind the scenes and seeing benchwork and wiring. The liner should extend as far as needed but still give you access to track in case of a derailment.

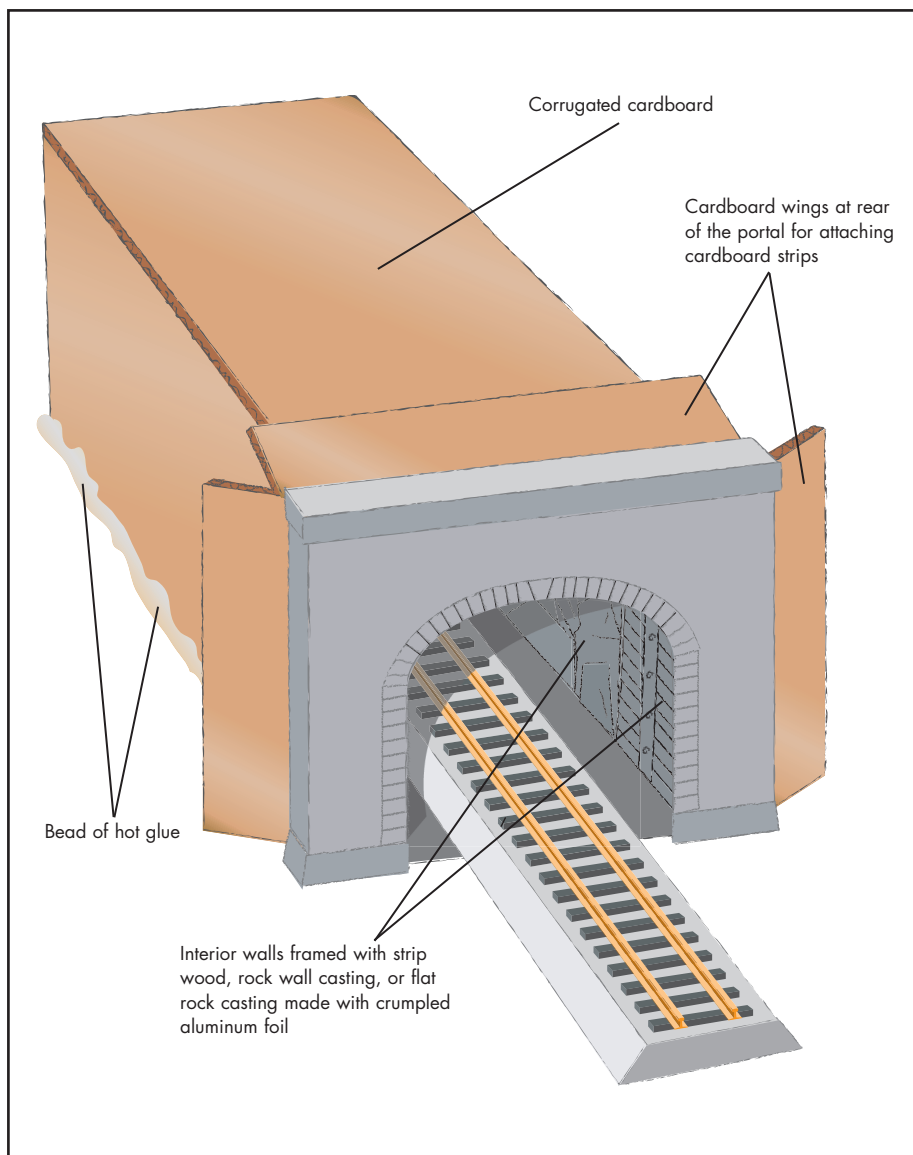
Liner walls can be hot-glued in place. Use a clearance gauge to assure that you have more than enough room for your highest and longest cars. I use a small carpenter's square placed against the rear of the liner to make sure they are perpendicular. The tunnel portal will abut the liner walls and be hot-glued to them.



The cardboard web on this section of the layout was built over the cardboard profiles, using the profiles as contour guides. Joe Galdi layout



On this N scale layout, the backdrop was built and painted before the cardboard strips were installed. The backdrop was covered with clear plastic to protect it while scenery construction was underway. Steve McKeon layout



A tunnel liner can be built on the workbench; it should extend far enough back to conceal underlying benchwork and wiring. The walls of the liner can be framed with strip wood, a rock wall casting, or a flat rock casting made with a sheet of crumpled aluminum foil.



Install tunnel portals before starting construction on the rest of the major scenery elements. The interior rock walls here were hot-glued in place before the shimmed-and-leveled portal was placed against them. Joe Galdi layout



One way to connect cardboard strips to a tunnel portal is to attach “wings” to the rear of the portal with hot glue. The wings provide a large gluing surface for the strips, and they don’t interfere with the interior tunnel walls.

I like to set each portal on two squares of wood or cork roadbed thick enough to bring the bottom of the portal to the top of the rail. Make sure the portal is centered over the rail with adequate clearance on each side. When a tunnel portal is on a curve, it’s a good idea to run your longest cars through it to make sure you have enough clearance. Also check your longest locomotive to see that the rear of the cab’s roof clears the tunnel sides.

Place a level on top and shim the portal’s feet with cardboard until it is square and perpendicular to the rail. Hot-glue the back to the liner walls and the feet to the wood or cork squares.

Finish the inside of the tunnel with more ballast, rock piles, or dirt—whatever is appropriate for the railroad you’re modeling. This material should be glued in place with diluted matte medium. (You’ll find information on scenic adhesives, including matte medium, in the next chapter.) When you’re happy with how the portal looks, bring the cardboard strips to the wings on the portal and glue them in place.

Fixing mistakes

The cardboard strip system is not only fast, but it’s flexible. If you don’t like the contours of the web, snip away the offending portion with scissors and try again. If an area is too high or too wide, crush it down to the desired height or shape and hold the web in that position with masking tape or staple another cardboard strip between the base and the crushed area. After the plaster shell is applied, these temporary supports may be removed.

If you find a clearance problem, now is the time to fix it. In HO scale I like to leave at least 3” between a clearance gauge placed on the track and the cardboard webbing. Three inches is enough to add rock formations over the strips and still have room for trains to pass safely. You’ll want to adjust this clearance distance, depending on the scale and gauge you model.

Making the shell

The cardboard web must be covered to form a shell. Before you start, protect the track by covering it with blue painter’s tape. This stuff is low tack and

will not leave a sticky residue on the rail. To be on the safe side, leave it on the rail only until the rough scenery work has been completed in that area.

Plaster-soaked paper towels

The first method developed for forming a shell over a cardboard web was to top it with a layer of plaster-soaked paper towels. Hand-sized pieces of heavy brown paper towels are dipped in soupy plaster and then draped over the cardboard frame.

It makes little difference whether you start at the top or the bottom. By starting at the bottom and working toward the top, most plaster drips will fall on areas already covered with toweling. To form a strong shell, overlap each new piece of toweling over the last by a third of its width. As soon as you run out of plaster, wash the container, spatula, and your hands, then mix fresh plaster and continue.

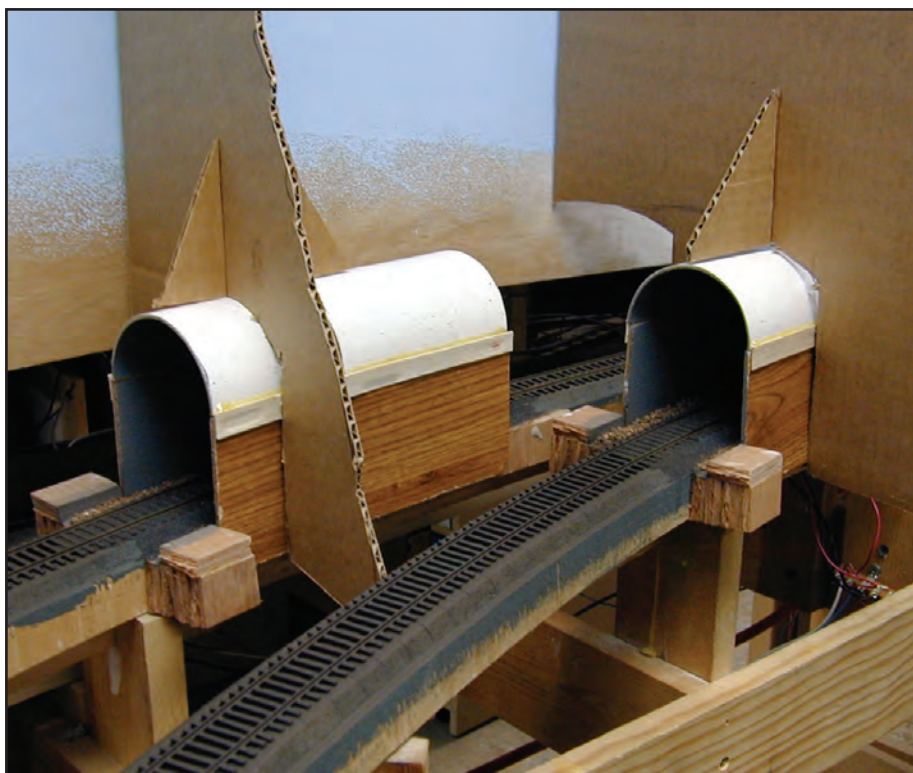
This method is still popular with many model builders, but it has drawbacks. The first is that plaster sets quickly, so you can mix only a little at a time. You have to work fast, so it's best to have two people: one mixing plaster and the other draping the plaster-soaked towels.

The second drawback is that plaster is messy. Everything you care about has to be covered, including the track, other parts of the layout, the floor, and even you. Remember to wear latex gloves and old "painting" clothes.

The advantages of using plaster-soaked paper towels over cardboard strips include the relative cheapness of the main ingredients, paper towels and plaster. I cut the towels in half for easy handling. You can use whatever type of plaster is available. When everything has set, the shell is hard and durable and will accept whatever scenery material you put on it.

Pre-coloring plaster

On several portable railroads, I have used pre-colored plaster for the scenery base. Because a portable pike often receives rough handling during transit, it's always getting nicked and scratched. The resulting scars will hardly show compared to glaring spots of white plaster.



These tunnel liners were made by slicing a cardboard mailing tube in half and hot-gluing pieces of it on top of the tunnel walls. The interiors of the tubes were painted black before installation. Sit the bottom of the tunnel portal at track level; here a small wood block was hot-glued on either side of the opening. Joe Galdi layout



Where clearances are tight, install the rock castings (see Chapter 4) first, using a clearance gauge as a guide. After you're sure there's enough room for the trains, install tunnel portals and other scenic features. Then shape the cardboard strips to accommodate the new elements. Dick Rotto layout



The author's preferred material for covering the cardboard strips is sold commercially as Plaster Cloth, Plaster Wrap, and Rigid Wrap. It can be purchased in hobby shops and craft stores.



Plaster cloth over the cardboard strips makes building scenic forms fast, easy, and neat. It's much easier and less messy than the plaster-soaked paper towel method.



Cut pieces of plaster cloth about hand-size, dip them in water, and drape them over the webbing. For extra strength, double the thickness and apply two layers.



Bob Hayden applies plaster cloth along an embankment adjacent to the track. The rock castings in the background will be hot-glued to the plaster cloth after it sets and dries. Dick Rotto layout



This demonstration module shows the progression of the scenery building process (left to right): cardboard strips, plaster cloth, Sculptamold, earth-colored paint, and grass texture.



Plaster cloth makes it easy to add to or change a section of scenery. The banking on this layout is being raised to match the land contours shown in the photos. Dick Rotto layout

My early experiments with coloring plaster met with no success. The coloring agent either weakened the plaster so much that it couldn't be used, or it bleached to off-white in a few days. Then I discovered that universal tinting colors, available in paint stores, tinted the plaster without affecting its strength too much. After some experimenting, I developed a light tan that tints plaster to a realistic earth color. The formula is 1 teaspoon of burnt umber, $\frac{1}{2}$ teaspoon of yellow, and a drop of black to two cups of water. Stir this around until the colors are mixed and then add two cups of plaster. This mix takes a little longer to set than untinted plaster, and it will not set quite as hard, but the color is good and does not fade.

While experimenting with the tinting colors, I also developed a color I call "chocolate tan," which can be used to represent rich or moist soil. Add 2 level teaspoons of burnt umber, $\frac{1}{4}$ teaspoon of red oxide, and $\frac{1}{2}$ teaspoon of black to 2 cups of water, then mix in 2 cups of plaster. Be careful with the black tint: If you use too much, the surface of the plaster turns darker as it dries, until the black masks out all other colors.

Remember that even if you're using colored plaster, it's wise to paint everything with earth-colored paint after the plaster sets. The colored plaster is "insurance" that if the scenery gets damaged you won't have an ugly white scar on your landscape.

Plaster cloth

Originally developed to make casts for setting broken bones, plaster cloth is the modern alternative to plaster-soaked paper towels. The non-sterile version is sold under the brand names Plaster Cloth, Plaster Wrap, and Rigid Wrap. Also used by crafters for making sculptures, this material is more expensive to use than plaster-soaked paper towels but offers model railroaders advantages that outweigh the additional cost.

Plaster cloth is much less messy than plaster-soaked paper towels, but nonetheless, I still recommend that you cover the track and lay an old towel on the floor to catch drips. That's about all the protection you need. With a little preparation, you can lay the scenic shell almost as fast as you can move.

Start by cutting the cloth into hand-sized squares using scissors or an old paper cutter. Cut up a whole roll at a time and store the leftover pieces in a ziplock bag. You'll also need a shallow pan or pail half-filled with room-temperature water.

Take a piece of plaster cloth, dip it in the water, remove it, allow the excess liquid to drip back into the dish, and lay the cloth over the web. Continue dipping and laying on the squares, overlapping each about one-third of its width. In high-traffic areas near the aisle or other places where visitors might bump into or lean on the layout, add several layers of plaster cloth for extra strength.

While the cloth is still wet, use your hand to smooth out bumps or rough spots. Plaster cloth takes 15 to 30 minutes to set, depending on ambient temperature, humidity, and the hardness of the water in your area. After it sets, you will have a strong yet thin shell that can be painted or covered with glue and texture.

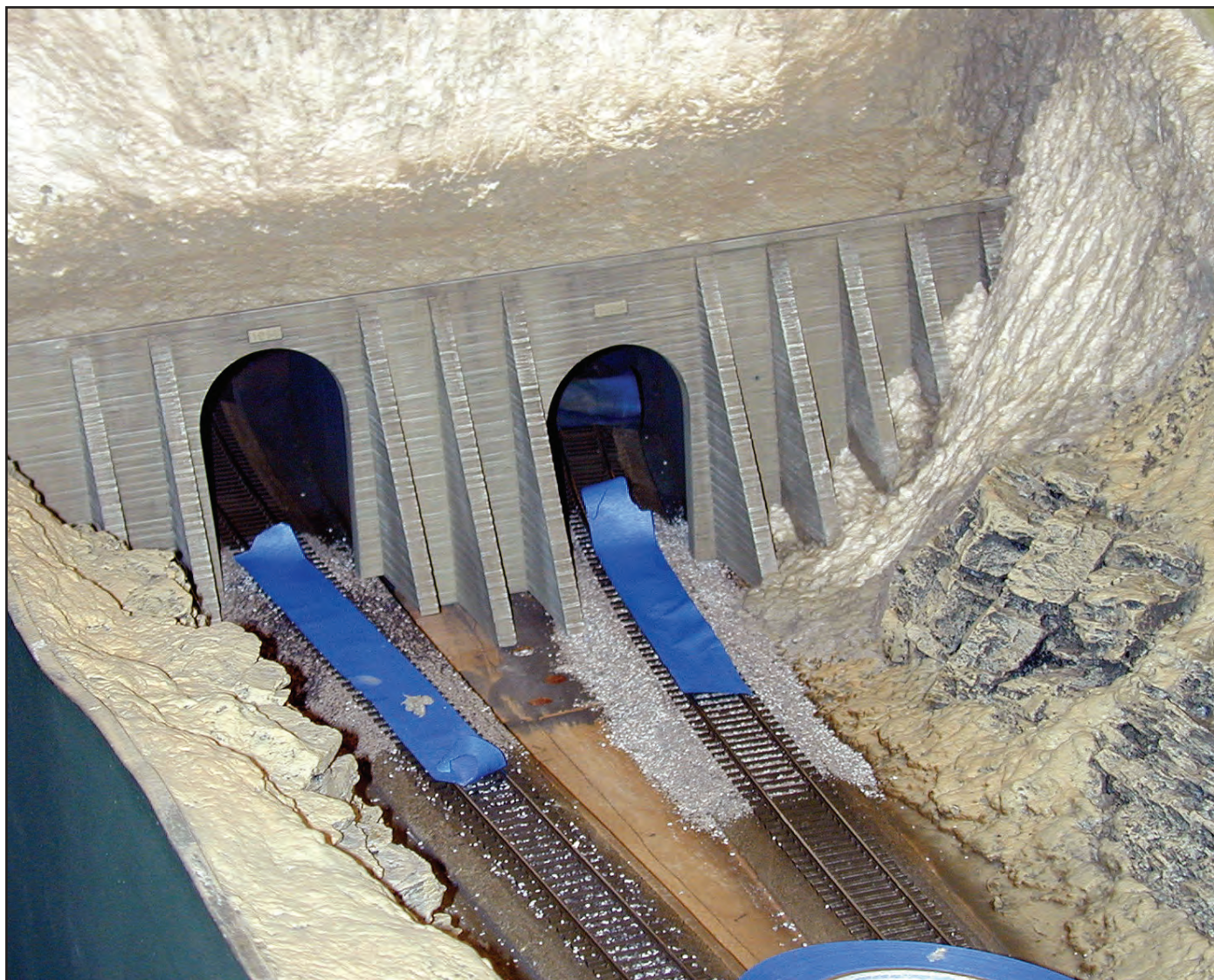
One disadvantage of plaster cloth is that it becomes brittle when it is re-wet or reworked, and the plaster component may crumble away. A thin layer of Sculptamold (see page 22) or Gypsolite (see sidebar on page 26) effectively reinforces and strengthens plaster cloth constructs. Either coating will seal the texture of the gauze and provide an excellent painting surface.



The strips in the portal area are being covered with plaster cloth. Sculptamold has been troweled on to fill the seams between the rocks castings. Dick Rotto layout



The author wanted the rocks to be closer to the track here, so he hot-glued them in front of the plaster cloth and blended the top edge into the existing slope with plaster cloth and Sculptamold. Joe Galdi layout



Here the tunnel portals have been installed and Sculptamold troweled on to make the contours. The front portion of the track has been ballasted. More ballast will be added inside the mountain through an access hole to the point where the track can no longer be seen. Dick Rotto layout



The author carved this erosion pattern by turning a stiff-bristled brush on its edge and pushing it into wet Sculptamold.

Sculptamold

Sculptamold is my favorite all-around scenery-building product. It's great for creating and refining terrain contours, building roads, and making shale-like rock formations

Sculptamold is a lightweight, clay-based, plaster-like material that mixes with water. It's easy to use and will stick to most surfaces. It sets hard and dries with little-to-no shrinkage. Added to water, it makes a thin mixture that can be painted on scenery, or it can be mixed stiff like mortar and troweled in place. It sets in about 30 minutes and dries hard overnight. The surface texture reminds me of coarse sandpaper or cottage cheese. It can be smoothed to make realistic concrete walls and roads.

Plaster still outshines Sculptamold for some applications, such as making rock castings (see Chapter 4), where a fine level of detail is needed.

Sculptamold is available at some hobby shops, crafts stores, and art suppliers. You can also order it from Scenic Express, Walthers, and its manufacturer, American Art Clay.

When you use Sculptamold for the first time, follow the manufacturer's instructions printed on the package, which suggest a mix of 2 parts Sculptamold to 1 part water. After you've mixed a few batches, you'll discover the mixing ratio and consistency that works best for you; it may differ a little from the printed instructions. From then on, you'll be able to "eyeball" the correct amount of Sculptamold and water you'll

ADDING COLOR AND TEXTURE TO SCULPTAMOLD

I've had good success coloring Sculptamold. Because Sculptamold mixes with water, any water-based paint will work. The only downside to pre-coloring is that the paint seems to cause the Sculptamold to take longer to set, so working time takes longer. Pre-coloring works best for high-traffic areas and modules, where the scenery will get a lot of wear and tear.

For most scenery, start with your favorite earth-colored acrylic paint diluted with an equal part of water. Mix ¼-cup of diluted

earth-colored paint with ¾ cup of water. Pour the liquid into a mixing bowl or bucket, along with a heaping cup of Sculptamold.

Adding flat black paint (or India ink, as explained below) to the Sculptamold, using the same proportions as the earth mixture, will give you a convincing asphalt or tarmac spread for roads and parking lots. Add a little red to the Sculptamold to simulate the reddish paving found in some parts of the United States.

Use colored Sculptamold as you would regular Sculptamold. When it dries, the color will be almost the same as when it was mixed, unlike plaster, which normally dries to a lighter shade.

I've mixed white glue, sand, rocks, ballast, and even sawdust into Sculptamold to achieve different textures. I've even tried Higgins Black Magic India Ink (½ teaspoon to 1 cup water plus 1 heaping cup Sculptamold) to get a good dark-gray base for asphalt roads and parking lots.



The track has been completely ballasted and the black cardboard tunnel liners glued in place. The erosion above the tunnel area is simulated by carving wet Sculptamold with a stiff-bristled brush. Dick Rotto layout

need, depending on the type of terrain you're modeling.

Sculptamold can be tinted with paint (see sidebar above), and white glue may be added to give it extra strength. I've also added small amounts of sand and other textures to create specific effects like rough desert terrain.

The best way to apply Sculptamold is with a rubber spatula, but a putty knife or stiff-bristled brush will also work. Spread a ¼" to ⅜" layer of Sculptamold over the scenic shell. It can be left as-is for a "cottage cheese" surface or smoothed with a wet brush to remove most of the texture.

For spreading and smoothing, I like to use a 1½" China-bristle brush and a container of clean water. Dip the brush in the water and smooth or texture the

surface. Keep dipping and smoothing until everything looks the way you want it. A palette knife can also be used to smooth Sculptamold and to shape rock-like effects as well.

If you get Sculptamold in places where you don't want it, use a clean, wet brush to clean it up. Follow that by dabbing with a wad of paper towel to absorb excess water.

Styrofoam insulation board

Extruded Styrofoam board, the material builders use to insulate flat exterior and interior surfaces, is sold in 2' × 8' sheets that range from ½" inch to 2" thick. It can be found at building supply stores, home improvement centers, and lumberyards.

Model railroaders use Styrofoam

insulation to make hills and mountains by cutting and stacking pieces like a layer cake. I've tried many methods to hold the layers in place and have settled on Liquid Nails brand construction adhesive as the best. It is sold in a tube for use with a caulking gun. Liquid Nails comes in many different formulations, so make sure you get one that is compatible with Styrofoam.

When gluing foam insulation, apply a bead of Liquid Nails on one piece of foam and wiggle it into place. This will give you the best glue coverage. Liquid Nails has enough body to hold the layers in place until it sets, which takes about 12 hours. Heavy pieces of Styrofoam may have to be weighted or clamped while the adhesive sets.

White or yellow (aliphatic resin or



After carving and shaping, polyurethane foam is porous and will absorb a lot of paint. Seal the surface by brushing on a mixture of drywall spackle thinned with equal parts of water.

carpenter's glue) glue can also be used to glue Styrofoam, but both take a long time to dry. In fact, glue sets only around the edges of the joint where it contacts air and rarely dries in the middle. I've torn apart 20-year-old scenery and found white glue still wet in the middle of a stack. If you decide to use white or yellow glue, also purchase several dozen long spikes. Use them to "spear" the layers together while the glue dries.

Working with Styrofoam

Much like wood, sheet Styrofoam can be cut and shaped with woodworking tools. For some jobs, however, I like using a hot-wire tool, which consists of a length of Nichrome wire stretched in a holder with an insulated wood or plastic handle. A transformer heats the wire hot enough to melt Styrofoam but not enough to glow red or cause a serious burn if you touch it.

Hot-wire tools also come shaped like screwdrivers and tuning forks for carving tight areas. I use a Y-shaped

wire holder 90 percent of the time.

The hot-wire tool gives a smooth, almost glass-like edge that is perfect when you need smooth contours and a finished look. Also, it doesn't leave messy foam crumbs to clean up afterward.

The principal disadvantage of the hot-wire tool is that it is slower than other methods. The wire cuts at its own speed: If you try to rush it, you'll end up breaking either the cutting wire or the tool. Also, the tool can be used for making only outside cuts—there are a lot of places where it won't fit.

A smooth cut can also be obtained with a sharp, serrated paring knife. I love the small, red- or black-handled paring knives made by Victorinox. This knife, my primary tool for almost all scenery-cutting jobs, is especially handy for cutting odd-shaped pieces of Styrofoam and making long, straight cuts. For straight cuts, I use a straightedge and hold the knife at a 45-degree angle. I scribe the Styrofoam and snap it to yield a long, smooth edge. As long as

you don't try to cut metal with it, one Victorinox knife will stay sharp for a whole scenery project.

For rougher cuts, use a hacksaw blade. I wrap electrical tape around one end to make a handle. Use short, quick strokes. Long strokes tend to bind the blade and can cause it to bend or break.

A crosscut saw can also be used to cut large pieces of foam. The cutting goes quickly, but the process leaves a lot of Styrofoam dust to clean up. And once the dust picks up a static charge, it sticks to everything.

Making Styrofoam mountains

Styrofoam hills and mountains can be made either solid or hollow. The solid approach works best when the hill is small or if extra strength is needed. Hollow hills are best when you're building a large mountain or covering a large area. The leftover foam scraps cut from the center of hollow mountains can be used to make small hills on other parts of your layout.



After the spackle dried, this mountain received its first coat of scenery—black and earth-colored paint.

Cut the Styrofoam, apply Liquid Nails, and stack the pieces. After the adhesive dries, use the hot-wire tool, serrated knife, and hacksaw blade to shape the exposed surface of the Styrofoam to make rough contours. There's no right

or wrong way to do this; just remove material until the contours are smooth and the overall shape looks good to you. Smooth the surface with a Stanley Sur-Form tool, a coarse wood rasp, or a wire brush mounted in an electric drill.

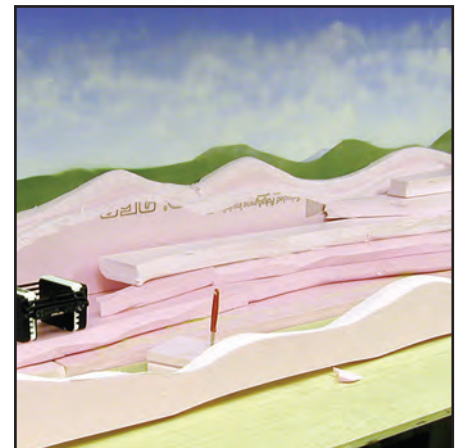
The Sur-Form tool is a wood rasp with a palm rest; it works best for smoothing large, broad areas. The wood rasp is good for shaping smaller cracks, crevices, and areas near the edge of the layout or around tunnel portals.



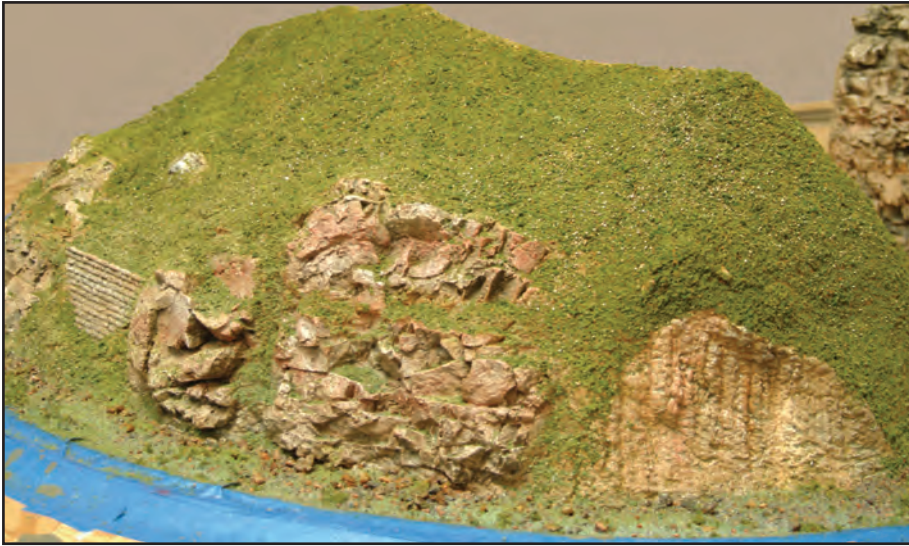
Serrated paring knives from Victorinox are great for cutting foam, cardboard strips, and other scenery materials. They're sold in fishing stores or over the Internet for \$4 or \$5. Don't confuse them with cheap paring knives you find in the supermarket.



Liquid Nails brand of adhesive is effective for holding together large chunks of Styrofoam because, unlike some adhesives, the chemicals in this glue don't dissolve the foam.



Here, Liquid Nails has been applied to the bottoms of strips of Styrofoam, which are stacked and weighted until the adhesive sets. The pieces will be shaped and plaster cloth applied over them. Don't Holloway layout



Here is the finished foam mountain. The surrounding scenery will be added as work progresses on the layout. Foam is a perfect scenery medium if you plan to plant a lot of trees—just push them into the foam!

GYP SOLITE FOR ADDED TEXTURE

My introduction to Gypsolite came when I modeled the Pennsylvania Railroad Middle Division as a project layout for *Model Railroader* magazine in the early 1990s. I needed a material that would duplicate the texture and hunks of rocks and coal in the soil of the coal-mining regions of Pennsylvania. Gypsolite's rough texture filled the bill.

Gypsolite is a gypsum plaster used in the construction trades as the base coat of plaster applied over Sheetrock® or wire lath. It has "tooth" to give the finish coat of smooth plaster something to adhere to. Its coarse surface texture comes from a lightweight mineral filler called Perlite. Another benefit of Gypsolite is the uniform hardness of its surface that prevents it from absorbing paint or glue as quickly as plain plaster cloth.

Gypsolite combines strength and lightness with a realistic, "gritty" texture. It can be mixed with water to make either a thin gruel for brushing, or it can be made in a stiff paste for troweling. Its real advantage is long working time: Gypsolite can be worked for about an hour before it gets stiff, and it takes up to four hours to completely harden. The long working time means you can complete large areas on your layout before it starts to set. When you're done, cleanup is easy: Rinse your

tools and brushes with clean water, and they're ready to use again.

Gypsolite is used in scenery building like Sculptamold or plaster. I also use Gypsolite like glue to hold pre-cast plaster rocks in place on top of the scenic shell (more on this in the discussion of rock casting in Chapter 4).

Mix Gypsolite and water to the fairly stiff but juicy consistency of whipping cream. Apply the mixture over the plaster cloth about ¼" thick with a wide brush. Brush on an extra-thick layer on the edges of the scenery or on areas that will receive a lot of abuse.

Gypsolite has two disadvantages. It must be applied over an absorbent surface in order for it to harden correctly, which is why it works well when applied over plaster cloth but not as well over foam. Also, Gypsolite doesn't work for casting in molds. It won't set correctly, and when you try to remove the casting, it will crumble in your hands.

Gypsolite is made by National Gypsum under the Gold Bond brand name. U.S. Gypsum offers a similar product called Structo-Lite. Both are available from larger building supply and plaster dealers. Gypsolite is also available from Scenic Express (800-234-9995, www.scenicexpress.com).

A wire brush mounted in an electric drill cuts fast but makes an awful mess—foam crumbs everywhere. Have a vacuum cleaner handy to suck up the bits of foam before they escape. For foam particles that you can't vacuum up because of static electricity, try spraying them with Static Guard. This will break the static bond and let you pick up the rest of the foam bits.

If you know where the rocks will go on your Styrofoam mountain, you can leave a flat spot for them. It's easier and faster to mount rocks on flat surfaces than to break them into pieces for curves.

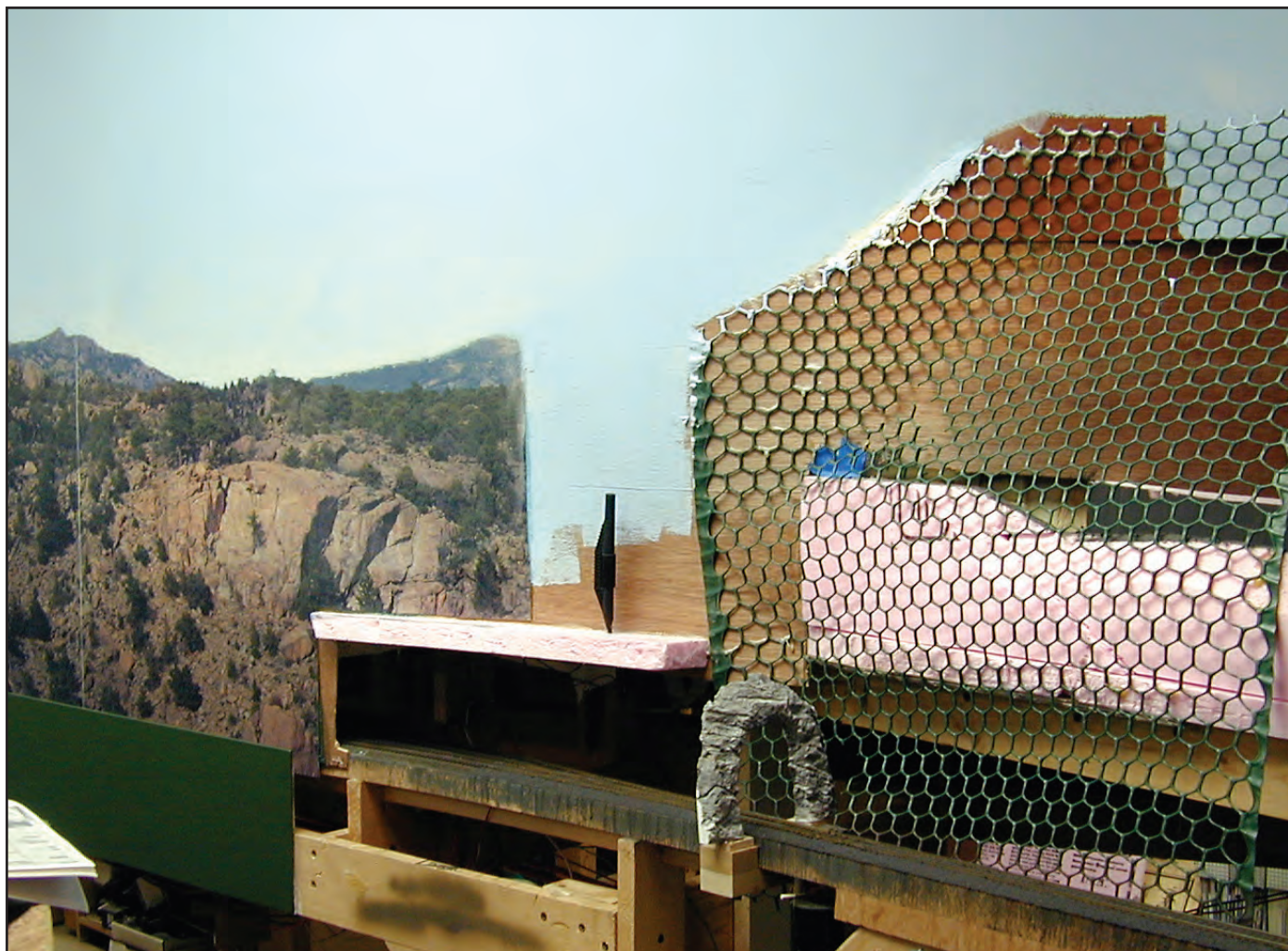
A removable mountain is an easy way to make an access hatch for getting at places on your layout that are hard to reach from the aisle. To make a removable mountaintop, omit the glue between two layers of foam. Use finishing nails to hold the layers in place while you complete the surrounding scenery. After the trees and grass are in place, remove the nails, run a thin-bladed knife around the seam to loosen the plaster and paint from the seam, and lift the top from the mountain. More on making access hatches later in this chapter.

Sculptamold over Styrofoam

After the foam is smoothed, it can be painted with any water-based paint. This will look okay, but the porous foam will absorb paint like crazy and take forever to dry.

If you want scenery paints to dry hard in 24 hours, seal the surface of the foam with Sculptamold. A thin layer of Sculptamold applied with a rubber spatula and smoothed or detailed with a wet brush is all you need. Sculptamold is one of the few scenery materials that sticks easily to Styrofoam, even when it's subjected to rough handling.

For projects where it's impractical to use Sculptamold, substitute drywall joint compound. Pre-mixed joint compound will stick to the Styrofoam, but will shrink and crack if applied too thick. The best way to apply joint compound is to thin it with an equal part of water and spread it over the foam with a wallpaper brush. You don't have to be fussy, just brush it on. The object is to cover the foam and seal the cell structure you exposed during carving.



For areas with tight clearances, use plastic poultry fencing rather than cardboard strips. Here, the fencing has been stapled to the backdrop; scenery will be built over it and blended into the photo mural on the left.

Joint compound dries; it does not set like plaster. This means that when you re-wet an area, the compound will soften again. Covering the compound with flat interior wall paint after it dries seals the surface against this happening.

I've had good results with coloring joint compound with lampblack (finely powdered soot used by artists as pigment) and water-based paints. About a quart of paint per gallon of compound is a good mix ratio to start with.

Military modelers mix a little diluted white glue with joint compound to prevent it from shrinking. This seems to work best if the compound is to be applied in a layer less than 1/4" thick.

Bead board scenery

Bead board is polystyrene foam board made from millions of tiny white foam "beads." The beads have been pressed together to form a solid shape. Most

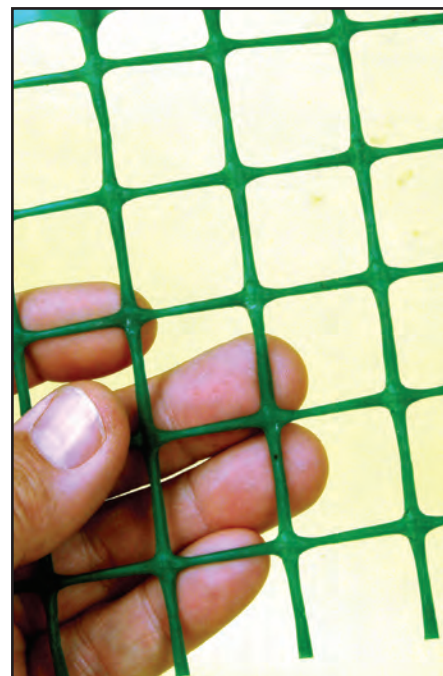
folks encounter bead board when they unpack a computer or TV set. The bead board is molded to fit around the object to protect it from shock and vibration.

I've had good success using bead board to build basic scenic forms. Treat it like Styrofoam and cut it with either a hot-wire tool or serrated knife. It can be glued with Liquid Nails, water-soluble contact cement, or white glue.

Use bead board to make concrete walls by troweling lightweight spackle or joint compound over the surface to seal it. When dry, sand the surface smooth and paint it a gray concrete color.

Polyurethane foam scenery

When I built my Cactus Valley project layout for *Model Railroader* magazine (December 1998 and January 1999 issues), I experimented with lightweight polyurethane foam sprayed over scenic forms made from bead board and



Poultry fencing comes in many different sizes and colors. Select a size with holes small enough to prevent polyurethane foam from falling through when you spray it on.



A large area of poultry fencing has been added to create a mountain that will hide the helix underneath yet will provide enough clearance for the trains running in the helix. Joe Galdi layout

plastic-covered paper wads. This is a viable scenery-building material that works well where lightweight, flexible, and chip-resistant scenery is needed: module scenery, for example, or a portable layout.



This small mountain was made with Great Stuff insulating spray. The foam is sprayed over a form made of wadded paper covered with clear plastic food wrap.

All the scenery finishing techniques in this book can be applied over a polyurethane foam shell. If you need to change a section, all you have to do is cut it away and spray on more foam. I use a brand called Great Stuff, which comes in a spray can, and is labeled “minimal expanding foam sealant.” Sold for filling cracks and holes around the house, Great Stuff sets tack-free in 20 minutes and cures completely in eight hours.

The other materials you’ll need for Great Stuff scenery are a tube of Liquid Nails, 1”-thick bead board or Styrofoam, sheets of newspaper or wrapping paper, plastic food wrap, and masking tape.

Polyurethane foam construction is simplicity itself. Start by cutting, fitting, and gluing sheets of 1” bead board between tracks for the flat surfaces of the layout. Set the bead board below track level, just even with the top of the track bed. Place the bead board along track embankments and other edges where a

shelf will be needed to support hills and other contours.

Form hills and contours by wadding paper into balls, piling them on top of each other to make the scenery shapes, and holding them in place with masking tape. Drape sheets of plastic food wrap over the wadded paper, bringing it to the edge of the track and taping it to the edges of the profile boards. The wrap clings to paper better than other types of plastic sheeting, and the foam will not stick to it. The foam also will not stick to most plastic bags, plastic drop cloths, and similarly slick plastic surfaces.

Applying polyurethane foam

After the scenic shapes are covered with plastic, spray on the foam. Be sure to cover the track, bridge abutments, and tunnel portals with blue painter’s tape. Spread a plastic drop cloth under the layout. Great Stuff foam sticks to everything, so wear latex gloves, old



Where sections of poultry fencing overlap, they can be “stitched” together with soft wire or the paper-covered twist ties that come with sandwich bags. Joe Galdi layout

clothes, and eye protection while applying it. Also wear an organic filter respirator to protect your lungs. Read the instructions and observe all the safety precautions.

Spray the foam directly onto the food wrap, as you would paint from a spray can. Start at the lowest point and work up the scenery using long, horizontal strokes. With a little practice and a steady hand, I found I could fill cracks, run small beads of foam around structure bases, and build special shapes.

Leave room for expansion: The foam beads will almost double in size before they harden. Plan your work session so that you use the whole can of Great Stuff. Partial cans do not store well and usually leak.

When a foaming session is complete, open a window, turn on a fan, and go away until the next day. This foam needs air to cure completely, and it emits relatively harmless gases while curing.

But there’s no sense breathing in fumes when you don’t have to.

If you get foam where you don’t want it, or if it droops, sags, or gets on the track, don’t touch it! Let it harden completely. Cleanup is much easier after the foam sets. Wads of cured foam can be chipped away with the blade of a small screwdriver. Any remaining foam can be removed with a brass-wire brush. Holes, gaps, and mistakes in the scenery can be filled later with another squirt or two of foam.

After the foam sets, you’ll have a shell about 2” thick that can be carved and shaped with a hacksaw blade, serrated paring knife, or a hot wire tool. I remove ¾” to 1” from the surface of the foam to create the contours. Cut away foam that interferes with trains, structure placement, or roads including any that oozed over the edge of the profile boards. After the general shape is established, refine the contours using

a Sur-Form tool or a wood rasp.

When you’re satisfied with the scenic shapes, peel away the masking tape and reach up from underneath to remove the plastic wrap and wadded paper. This leaves a hollow scenery shell that can be finished on the layout or cut free with a serrated knife and moved to the workbench for finishing. When complete, it can be reattached to the layout with a bead of Liquid Nails.

Access hatches

When you cut the shell free, you’ve made an instant access hatch. If you put a notch in the shell before freeing it, you’ll have an easy-reference alignment point so you know exactly where to position the shell when you put it back. On a large museum railroad I built using sprayed foam, all the mountains were removable. I shaped and painted them on the workbench, added rock castings, and placed trees before re-attaching



On really large layouts you may want to build a “backbone” out of $\frac{3}{8}$ ” plywood. The plywood serves as a solid support to hold large expanses of cardboard web or poultry fencing. Charles Ro layout

the mountains to the layout. Any of them could be lifted off to do routine maintenance, and visitors couldn’t tell they were removable!

Sealing foam scenery

Great Stuff foam is very porous after it has been smoothed and shaped. It needs to be sealed to prepare it for color and detail. To do this, use joint compound thinned with an equal part of water as described above under “Sculptamold over Styrofoam.” Apply a thin layer over the smoothed foam using a wide, stiff-bristled brush. Work the compound into all the small bubble holes.

More texture can be created by stippling the surface of the joint compound with the brush. Add texture everywhere, except where structures will be placed. After the joint compound dries, prepare the scenery with a coat of earth-colored paint.

If you’re building desert scenery or just want more texture, add several handfuls of Paint ‘n Tex to the thinned joint compound. Available in the paint section of hardware stores, Paint ‘n Tex is an expanded mineral product that’s

added to interior ceiling paint to make textured “popcorn” ceilings. It gives the joint compound a nice, lightweight rock texture that’s perfect for scenes where rocks and rock debris dominate the landscape.

Other types of scenic bases

Plastic poultry fencing—the modern equivalent of chicken wire—makes a rugged scenic base in places where you need to cover a large area with solid foam shapes or rocks or train clearances are tight. It’s sold in farm supply stores, home improvement centers, and building supply stores.

To use plastic fencing, first cover the area where it will go with a plastic drop cloth to keep drips or spills from getting on the track or the floor. After that, staple sheets of fencing in place using supports where needed.

I form scenic features as I go by bending and folding the fencing. Alter the shape and contours after the plastic fencing is in place by heating it with a heat gun. Leaving an access hole in a seam of the fencing will allow you to reach behind to attach the rocks.

At this point, the fencing can be sprayed with Great Stuff to create a scenic shell. After the foam hardens, smooth and shape it as described above.

Make large rock faces by hanging pre-cast polyurethane rocks on the fencing with floral pins or bits of wire bent in a U shape. Since the foam rocks are quite soft, the pins will hold them firmly in place.

I pre-paint the rocks (see Chapter 4) and spear them in place with the pins. This takes two hands, one to hold the casting against the fencing and the other to reach behind the poultry fencing and push a floral pin into the back of the casting. Make sure the pin straddles a solid area of the fencing.

After all the rocks are attached, spray Great Stuff between and around them and allow it to expand and set overnight. The next day you’ll have a solid scenery shell with the rocks incorporated. Trim away the foam that has oozed between the castings and smooth the seams so they blend with the rock faces. When the plastic drop cloth is removed, the rock wall will be ready for painting and finishing.



Basic colors, textures, and adhesives

Once the scenery base is built, the next step is to add color and texture to make the base look believable. Color and texture were added simultaneously to Dick Rotto's HO Raton Pass layout.

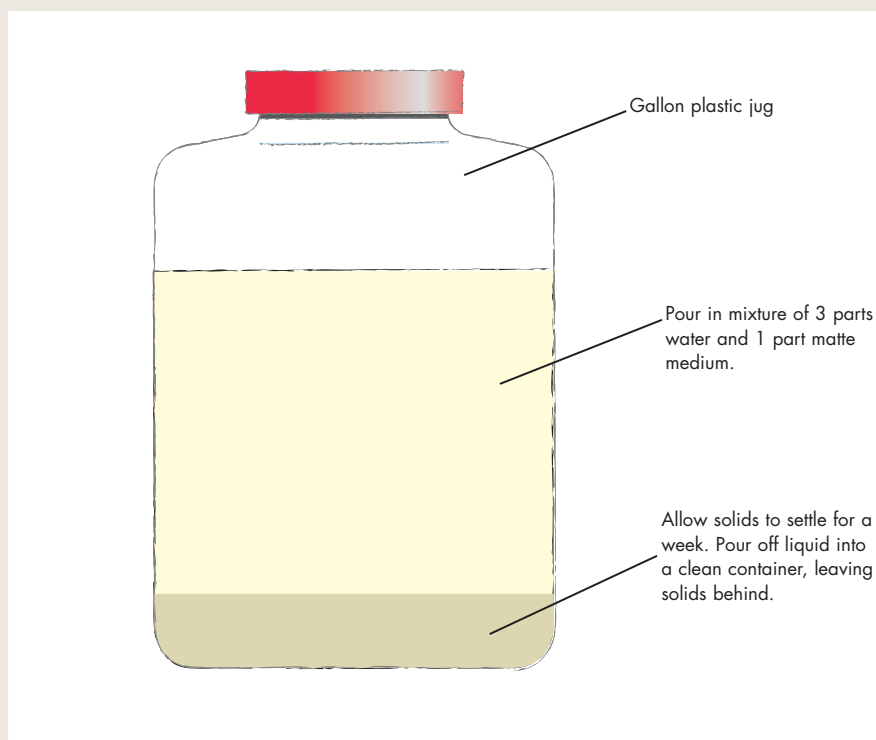
The colors, textures, and adhesives used to build water-soluble scenery are materials you can find in craft stores, hobby shops, art supply houses, hardware stores, and home-improvement centers. Other materials are available from on-line retailers and through mail-order catalogs. Many other useful items are free for the taking and found by spending a pleasant day wandering in the woods or fields. Imagination and variety are the keys to using materials creatively to produce realistic scenery on your model railroad.

MAKING MATTE MEDIUM BONDING SOLUTION

For scenery building, thin matte medium with “wet water” (see sidebar on p. 34) to make a liquid adhesive that can be brushed, sprayed, or dribbled onto a scenery surface. Mix 3 parts wet water with 1 part acrylic matte medium (used by artists to thin acrylic paints). Stir the contents or shake the jar until the matte medium is completely diluted.

Pour this mixture into a large, wide-mouth jar and let it sit, covered and undisturbed, for at least a week. During this time the solid filler material will settle to the bottom of the jar, leaving the milky liquid adhesive above. Pour this liquid into another jar, leaving the solid residue behind. Discard the residue, and wash the container to use again.

I decant the matte medium liquid into another container because some cheaper brands of medium have talc added as filler. If you don't separate the medium from the talc, the talc will contaminate the bonding solution and leave a white residue on the scenery after it dries.



A handy adhesive for model railroad scenery building can be made from acrylic artist's varnish heavily diluted with water and allowed to sit for a week while the solids settle out.

Adhesives

White glue should be the first adhesive that comes to mind when you think of water-soluble scenery. It mixes well with water, adheres to the porous materials used for scenery construction, and is available everywhere. It sets in 30 to 60 minutes, depending on your conditions, and dries hard in about four hours. The only disadvantages for scenery building are that white glue sometimes dries with a slight shine and it tends to get gummy if re-wet several times.

As you'll discover later on in this chapter and elsewhere in this book, thinned white glue has many uses in scenery building. To thin it, mix 1 part white glue (Elmer's or another brand) with 3 parts water. Don't use carpenter's glue or other thick yellow glues. They don't mix as well with water.

Add to the mixture several drops of liquid dishwashing detergent to the mixture, pour it into a large plastic container with a screw-top lid, and give it a good shaking. The solids in the glue

settle, so you'll have to shake the container thoroughly before each use.

Apply thinned glue with a plant sprayer, brush, turkey baster, or eyedropper. A squeeze-type mustard bottle purchased at a dollar store also works; it's great for applying a lot of glue to a large area, as when ballasting track.

To glue details in place, mix equal parts of white glue and water. This mixture is just thin enough to stick to the detail but not drip on the track or surrounding scenery. Full-strength white glue is also a handy adhesive for planting trees, telephone poles, large shrubs, and other heavy scenery objects.

Matte medium is an acrylic varnish sold in art and craft stores and used to thin acrylic paints. It makes the colors more transparent and gives them a flat, or matte, finish. Matte medium is also a powerful adhesive, but be careful: once it dries, it cannot be resoftened by applying water.

Matte medium goes on milk colored but dries flat and invisible. I use thinned

matte medium as the adhesive for lightweight texture areas, such as large grassy sections and tree foliage.

Already discussed in the previous chapter, Liquid Nails is a construction adhesive designed to bond wood, plaster and plastic castings. It can also be used to bond Styrofoam and bead board, but for those materials, make sure you purchase a Liquid Nails formula that won't attack foam. It comes in a tube and is applied with a caulking gun. Liquid Nails is tacky enough to hold large stacks of foam in place without resorting to nails or weights. It stays soft for about an hour after application, so you have time to reposition parts.

A hot glue gun and low-temperature glue sticks are also useful to the scenery builder. I like the low temperature sticks because I'm less likely to seriously burn myself with them. I still have to be careful, but the burns don't hurt as much. Also, the low-temp glue can be removed easily from most surfaces by simply peeling it up.



If you're in doubt about what colors complement each other or how to produce a darker or lighter shades, get a color wheel. This two-sided device makes it easy to mix the color you need.

Because I'm always dropping and breaking glue guns, I buy three or four inexpensive ones at a craft store instead of an expensive construction-grade gun.

Hair spray, particularly the unscented super-hold varieties sold in spray cans and pump bottles, is handy when building scenery. I prefer the spray cans because they deliver a finer mist than the pump dispenser and the nozzles don't clog.

Hair spray is very sticky and is the adhesive of choice for holding lightweight texture materials on vertical surfaces. For example, when I want to create the look of fallen leaves on a sheer rock face, I spray the rocks with a light mist of hair spray, sprinkle on the leaves from above, and apply more hair spray to set the leaves in place. The leaves stick perfectly to small outcroppings on the rock. Because hair spray is meant to be washed from your hair, it's water soluble and can be removed from most scenery surfaces with a wet brush.

Acrylic paints

Acrylic paints and media form the foundation of the water-soluble method of building scenery. These paints are technically acrylic polymer emulsions consisting of three elements: pigment, binder, and water. When the water evaporates (during the drying process), the binder and pigment form a tough, flexible film that is stable and fade-resistant.

Acrylic paints have been around since the 1950s but gained popularity with modelers when they became readily



Here's the back side of the color wheel. By turning the wheel over, you can find out what color to add to blue, for example, to make a third color.

available in craft stores. Acrylics are sold in a wide variety of grades, colors, and container sizes. Buy colors pre-mixed in tubes or plastic bottles, or mix your own.

Mixing colors to make a special color or to match an existing color does not take a lot of skill—just a basic knowledge of color. If you think you're going to mix a lot of your own colors, buying a color wheel will be a good investment. It will help you determine the correct mixes to produce lighter or darker shades.

The acrylic paints used for building scenery can be applied with cheap China-bristle brushes. If you clean the brushes after every use, they'll last for the whole project.

Basic colors

Your first paint purchase should be the generic earth color you'll use on your layout. You'll use this for the dirt areas of your layout, and you'll mix it with other colors to make different shades and blends.

Earth color serves as a base coat over the raw white plaster and as a sealant on the scenic shell. You can sprinkle texture into the wet paint (using the paint as an adhesive) or wait until the paint dries and use glue to hold the texture in place. Here are several good earth colors to get you started:

- Benjamin Moore 1B-1122 Cocoa Sand
- Benjamin Moore 2B-1075 Fairway Oaks
- Dutch Boy 2A-4 Basketweave



Collect earth-colored paint chips from different paint manufacturers so you'll have a variety to choose from when considering the correct color for a modeling project.

- Dutch Boy 3A-4 Grand Stand Tan
- Pittsburgh 3609 Wheatland
- Pittsburgh 3610 Poplar
- Pittsburgh 7605 Tortoise (for freshly plowed, wet soil)
- Sears Easy Living II 122 Burro Beige
- Sears Easy Living II 131 Warm Oats

Benjamin Moore offers more than 260 colors of flat wall paint in 2-ounce jars. You can try different rock, earth, and sky colors on your layout before buying a whole quart or gallon.

Colors go out of fashion. When you find a color you like, make your own paint chip by applying the paint to a piece of clean, white cardboard. Write the name of the manufacturer, color name, and number on the card. If you need more of that color years down the road, the paint store will have all the information it needs to mix a replacement.

While you're at the paint store, buy a quart each of flat white and flat black interior latex paint. You'll need these later in the scenery painting process.

As an alternative, some modelers collect earth- and sky-colored paint chips at the paint store and take them home to see how they'll look under their layout lighting.

A good way to find the exact colors needed to build your model is to collect dirt samples from your prototype railroad. I gather soil samples from areas near the tracks and beside the road, put them in coffee cans, and label where I got them. Remember that you want an



Tints-All is a concentrated pigment that comes in many colors and can be mixed with water to make a wash (as shown on the plaster rock casting here) or mixed with plaster or Sculptamold to color them.



Several different earth colors appear on this expanse of canyon scenery. Some were simply blended with basic scenery black to make a darker earth color. A photo of a similar real-life canyon was taped to the top of the scenery to serve as a color reference. Joe Galdi layout

MAKING “WET” WATER

Wet water is the basic thinner for all the water-soluble scenery-making materials discussed in this book, including matte medium. Wet water is simply tap water with a wetting agent added. The wetting agent reduces surface tension in the water and helps it flow more easily and soak more quickly into scenery materials. Several

different fluids can be used as wetting agents, including:

- Liquid dishwashing detergent, such as Joy or Dawn
- Kodak Photo-Flo (used in photo finishing)
- Isopropyl alcohol – 70 percent solution (rubbing alcohol sold in pharmacies)

To make wet water, combine:

- 16 ounces (pint) of water with
- 1 teaspoon of liquid dishwashing detergent or Photo-Flo

To make super-wet water:

- 8 ounces water with
- 8 ounces rubbing alcohol

ordinary dry-soil color. Don't dig fresh loam from your backyard or dirt immediately next to the track, because both may be too dark.

Spread the soil on newspapers to dry it. If you're concerned about bugs and other critters living in the soil, let the soil dry outside under a cover to keep rain from washing it away. When it's dry, sift it through a window screen to remove the larger pieces. Glue some fine dirt on a white card to make a color sample. Add enough dirt so no cardboard shows. Bring the sample with you to the paint store and look through the color charts until you find a close match.

Memory alone just doesn't work well when it comes to colors; colors that look good in the store may be much too blue

or pink under your layout's lighting. If you can't find a ready-made match, have the store scan the sample and mix the color for you.

Buy a gallon of flat, indoor, water-based wall paint in this color. This will be the earth color for your railroad. You can lighten or darken it by adding flat white, flat black, or a lighter or darker earth color.

Whatever color you chose, you'll want to dilute it with equal parts of water for use on the scenery. Thinning the paint makes it easier for the color to flow onto a rough scenery base. Mix only what you'll use during the next month or so.

To make a light earth color for dry-brushing (see “Shadows and Highlights” on page 51), mix 2 parts

basic earth with 1 part flat white that has been diluted with equal parts of water.

I store all scenery paints in 1-gallon plastic jars labeled with paint type, color, dilution, and date.

Generic scenery colors

If you don't live close to the area you're modeling, you'll have to determine dirt, ballast, and gravel colors from books and color photos. Some modelers buy fine gravel or ballast at a hobby shop and use it as the basis for choosing a base color. If you use construction sand (see next page) as your base texture, you'll find several earth-colored hobby paints that match the sand's color. Other modelers find it easier to buy hobby paint labeled “earth,” make a color chip, and take the



The earth color on the foreground scenery here was brought up to and blended into the painted background.

chip to a paint store to have the color duplicated in less-expensive wall paint.

Here are some formulas for other generic scenery colors:

Earth wash for tinting rocks. Add 1 cup of your basic earth color to 2 cups water. This thin earth color is easily absorbed by the plaster. Make this wash fairly thin to begin because if you think the color is too light, you can add more paint. The opposite problem—too much color—is much harder to fix.

Basic scenery black. Use this color as an undercoating on polyurethane foam rocks and in places in the scenery where you want deep shadows. Dilute flat black wall paint with equal parts of water and then mix in 3 parts basic earth color with 1 part diluted black. Store in a snap-top plastic container and mix thoroughly before each use.

Basic black wash. Use a basic black wash to tone down and weather rocks and other scenic elements. Apply it to structures, concrete streets, people, and other places where you need a little darkening to indicate the effects of dirt, smoke, or soot.

Put 16 ounces (2 cups) of wet water (see sidebar on page 34) in a 1-pint spray bottle with 2 teaspoons of India ink. Add more ink if you want a darker wash. Shake the bottle to mix and test-spray it on a piece of scrap plaster.

Rock shadow color. Mix 1 cup of basic rock color and $\frac{1}{4}$ teaspoon of India ink in a shallow dish.

Rock highlight color. Mix 3 tablespoons of flat white latex paint into $\frac{1}{2}$ cup of basic rock color.

Concrete color. Make a concrete color for foundations, tunnel portals, and other structures by mixing 4 parts flat white paint with 1 scant part Mars Black, 1 part Raw Sienna, and 3 parts full-strength matte medium. Add a few drops of water and mix.

Other rock colors. Use the basic rock color as a starting point to build upon when experimenting. Keep notes so you can repeat the results. These suggestions are based upon starting with 16 ounces (2 cups) of basic rock color.

For blue rock, add 1 teaspoon (or more) of cobalt blue acrylic paint to the basic rock color.

For red rock, add $\frac{1}{2}$ tablespoon red oxide tinting color or a 1" squeeze of raw sienna acrylic tube color to the basic rock color.

Always experiment with new colors on a piece of scrap rock casting before using them on your layout, and evaluate colors only after the plaster has dried.

Basic earth texture

No basic texture simulates dirt as well as real dirt. It's free for the taking (dirt cheap!) and easy to apply. It also looks great! You can gather this basic texture anywhere: from the side of a road, in the forest, or from your own backyard garden.

Before you use dirt on your scenery, it

needs to be dried and sifted. After drying it thoroughly for several days on several layers of newspaper, sift it through an old window screen to remove dead bugs, sticks, and pebbles. You may need a $\frac{1}{4}$ "-mesh screen for larger-scale scenery. I store dirt in labeled clear plastic bags for easy identification.

Construction sand. Available from sand and gravel suppliers, construction sand can be sifted into several grades to serve as basic texture for desert scenery and other localities that have light-colored soil. The advantage of this sand is that it has "sparkle." The tiny bits of mica mingled with the sand particles add life to any scene. Sand can be sifted and stored in the same manner as dirt.

Ball-diamond dirt. For modeling finely textured dirt, try the clay-based material intended for dressing baseball diamonds. George Sellios first introduced me to this material; he used it on his Franklin & South Manchester model railroad with realistic results. Ask the groundskeeper at a local Little League field for a coffee can or two.

Diamond dirt has a nice color and texture. It can be sifted to a consistency as fine as face powder, and it works great in areas of the layout where you need just a hint of texture. It's also good for dirt roads and ditches along the track, as well as for filling in between grassy areas. Mix it with other soil material and fine stones to get a realistic desert texture.



A special clay-based mixture that makes excellent dirt on model railroads, this fine dirt was collected from a baseball diamond. It's being sifted into wet earth-colored paint to make a dirt road.



The basic scenery black in this scene has been painted on freshly sculpted Sculptamold. Earth color will be dry-brushed over the black after it dries.



Basic scenery black is painted over polyurethane foam rocks to provide a dark "primer" for the rock colors that will be dry-brushed over the rocks.

BASIC ACRYLIC COLORS

You can purchase artist's acrylic colors at most craft and art-supply stores. You don't need to purchase artist-quality paints; "school grade" colors are less expensive and work just as well. I buy these paints in tubes (the paint stays fresh longer) or 16-ounce plastic squeeze bottles. Use white acrylic gesso to seal Styrofoam where a fine surface is needed.

For rock coloring you'll need:

- Burnt sienna
- Burnt umber
- Mars black

- Raw sienna
- Raw umber
- Rock powders or pigments.
- Titanium white
- Yellow oxide (optional)

For building waterways, in addition to the colors listed above, you'll need:

- Cerulean blue
- Chromium oxide green
- Cobalt blue (or ultramarine blue)
- Permanent green
- Phthalo blue



Choosing an earth color that duplicates the dirt color of your favorite prototype is one of the basics of the water-soluble scenery system.

Vermiculite. Vermiculite, expanded mica, is an earth-texture material that comes in handy where you want to duplicate the shine of desert and mountain scenery. Sold in bags at garden centers, vermiculite is used by gardeners as a soil conditioner.

To use vermiculite for scenery, rub a little in the palm of your hand to break it into smaller pieces. Because it's lightweight, vermiculite will stick to steep hillsides dampened with hair spray, diluted white glue, or matte medium. In my early scenery-building days, I even mixed vermiculite with equal parts of contractor's sand to make a basic earth texture.

Commercial scenery textures. You can also use commercial scenery textures marked "earth" or "dirt." Some of these are real dirt sorted by color and sifted to size. Others are earth-colored scenic foam that looks like dirt when spread out on a road or beside the track.

Grass textures

Available in a wonderful assortment of colors and textures, commercially available ground foam may be used to represent grass and weeds. Woodland Scenics, Scenic Express, and several European manufacturers offer a wide variety of products. Throughout this book, I will lump most of these products

together under the generic name "scenic foam" because most of them are made from foam rubber or latex. You can also make your own scenic foam; see the sidebar on page 38.

You'll need several colors and textures of foam for a basic texture palette. Start with several greens and an earth color a little darker than your earth paint. Buy both fine and coarse textures, and select lighter greens and yellow-greens rather than darker shades. Lighter colors help brighten the layout under relatively weak indoor lighting.

While you're at the hobby shop or craft store, purchase an assortment of weed material, several tree kits, and a



Here's a typical green foam blend consisting of several shades of green scenic foam, yellow foam, and brown sawdust. Blending textures and colors makes for greater realism.

couple of packages of brown or dead-leaf-colored scenic foam. These will get you started. Other textures can be purchased or gathered as they're needed.

Grass and texture "blends"

As a young and impressionable art student (no pun intended), I was blown away by the work of the French post-Impressionist painter Georges Seurat (1859-91) and his school of "pointillism." Seurat painted scenes consisting of millions of tiny dots of pure color (his most famous painting, *A Sunday on La Grande Jatte*, is at the Art Institute in Chicago). When you step back several feet from the painting, your eyes and brain blend the colors into a beautiful picture. This is much like the color images you see in newspapers and magazines, which are also made from thousands of colored dots that your brain blends into coherent pictures.

I got to thinking about Seurat and his work and the effect it could have on the boring look of most "green grass" scenery. I experimented by blending different colors of scenic foam. These blends helped me produce a wide variety of colors and textures that were not available commercially.

Making a blend is simple—and a good way to use odd-colored foams or other leftover textures. Used even in small quantities, blends can vary the overall effect significantly. Another advantage of blending textures is that each batch you make is different from the previous one, creating yet more variety.



Fake fur is sold in fabric stores in a wide variety of colors. Gold and straw colors are good for duplicating the straw-colored grasses of the West.

Start by mixing up a summer blend. In a large plastic grocery sack, add a handful each of several different yellow-greens, both fine and coarse; four or five different greens (light, medium and a little dark); and brown. Then add a pinch of other leftover colors like spruce green, red flower texture, green flocking, and even brown dyed sawdust.

Close the bag and give it a good shaking to mix the colors.

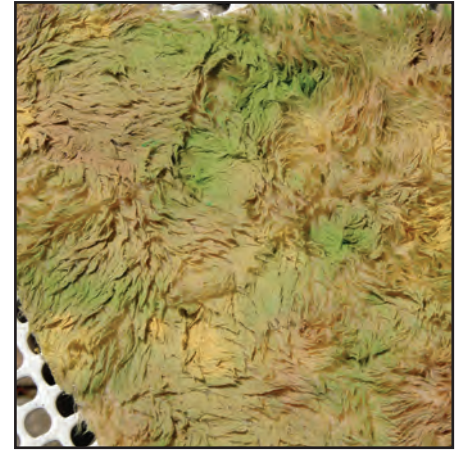
For a fall blend, mix several handfuls of yellow, red, orange, and brown. For trees at lower elevations, mix some green blend into the fall blend to represent trees that are just starting to change color. For mountaintops, add a little blue foam to make the blend look colder.

Fake fur grass

Since the first edition of this book was published, a vast array of great new scenery products has been introduced to make the model railroader's life easier. Among the best are new materials for modeling tall grass. (Chapter 5 discusses modeling foliage and undergrowth in greater detail.) However, some modelers still prefer to make their own, and one of the most effective materials for home made grass is still fake fur. Fake fur is a synthetic material sold in fabric stores in many different colors.

To make a field of tall grass from fake fur, cut a piece of fur to size with scissors. Shake the piece to remove loose fuzz from the edges.

I like to color the fur before gluing



This messy stuff is fake fur that's been wetted and colored with diluted acrylic colors. After the fur dries, the surface will be combed and fluffed to produce good-looking tall grass.

it in place. Arrange the fur pieces on several layers of newspaper, then mist them with wet water (see sidebar on page 34) from a pump sprayer. You can also put it in a sink and run cold water on it. The fur will look pretty mangy until dries, but don't panic.

You'll need two small shallow dishes for mixing colors. For the field color, I add $\frac{1}{4}$ " of Permanent Green acrylic tube color and $\frac{1}{4}$ " of cadmium yellow to $\frac{1}{4}$ cup of wet water and mix thoroughly. In the second container, mix about $\frac{1}{2}$ " of burnt umber with $\frac{1}{4}$ cup of water for an "amber waves of grain" look.

With a large, soft brush, flow the washes onto the fur, dabbing and brushing to vary the color. If you get a clump of color, don't be alarmed. Just spray on more water and brush it out.

Allow the fur to dry completely. When it is dry, use a large plastic comb to fluff it up until it's as soft as it was before you wet it. Any loose fibers along the edges can be trimmed away with scissors. At this point, if the color is not what you want—remember, it will dry lighter—just re-wet the fur and add more color.

When you've achieved the desired color and the fur is dry, tint the tips of the fur strands to look like new grass or ripening grain. Put a few dabs of acrylic green and yellow on a damp paper towel and wipe the towel gently over the tips. If you apply too much color, wipe away the excess with a dry towel.

To install your fake fur field, apply a thick coat of white glue on the scenic base and press the fur into it. Add small

MAKING YOUR OWN SCENIC FOAM

Rather than use commercially available ground foam, some hardy souls prefer to make their own scenic foam. This might sound like a fun thing to do and an easy way to save money, but it is a lot of work. Your biggest investment, other than time, will be in a meat grinder. Yes, you read that correctly: a meat grinder.

Years ago, I found a commercial motor-driven meat grinder at a flea market: a big, heavy machine perfect for grinding foam rubber. A crank-type meat grinder, the kind meant for grinding sausage, will also work—if you want to get in shape (or already are).

Next, you'll need a source of foam rubber. The material I used, from an upholstery firm, consisted of scrap pieces from various jobs. The company was glad for me to take it away.

I've always made foam outdoors in the summer months to keep the cleanup to a minimum. It's hot, thirsty work, and you'll need to do it in a workspace that you can clean up with a hose!

You'll need the following materials:

- Disposable aluminum roasting pans
- Flat green indoor wall paint (different shades)
- Foam
- Grinder
- Matte knife or scissors
- Plastic gallon jars with screw-on lids
- Rubber gloves
- Newspapers

Here are the steps for do-it-yourself scenic foam:

1. Clamp the grinder to a heavy surface like a picnic table and place a pan under the cutter to catch the foam.
2. Cut the foam into 2" strips about 12" to 18" long or as long as will fit in the pan.
3. Dilute 1 part flat green paint with 5 parts water, and mix well. Store in a plastic gallon jug.
4. Put on your rubber gloves.
5. Fill a disposable aluminum roasting pan half full with the diluted paint, and

add the foam strips. Push them under the paint and squeeze them so they'll absorb the paint.

6. Lift a handful of strips over the pan, and squeeze them to remove most of the liquid.

7. Lay them on newspaper or several old wire screens set on top of a few bricks to facilitate air circulation, and allow to dry. Turn the strips often so they won't stick to the paper or screen as they dry.

8. After the strips are dry, cut them into 2" cubes with the scissors.

9. Feed the cubes of foam into the grinder. Use a stick to coax the chunks into the feed auger. Do not put your fingers into the hopper! The size of the cutter blade will determine whether the foam is coarse or fine.

10. After grinding, sift the foam through a window screen to separate the grades. Coarse pieces can be sent back through the grinder to make them smaller. Store the foam in gallon-sized plastic bags.



Fluff fake fur grass by running the coarse teeth of a comb over the surface. The combing will also remove loose fibers from the surface.



A wide assortment of realistic weeds is available in your hobby shop. Here's a weed product made by Heki called Micro-Flor. It's a flock-like material that's held in place with white glue. Dick Rotto layout

weights along the edges to hold the fur flat until the glue dries. An alternate way is to turn the fur over and spray 3M adhesive on the back, flip the fur, and press it into place on the scenic base. Detail the field by adding hedgerows, stonewalls, and fences.

Flocking

Flocking is a by-product of manufacturing textiles. Noch offers several colors for scenery. Flock fibers are about 2" long in HO scale and resemble long blades of grass. Flocking works best as fine texture in the

foreground, where visitors are close to the scenery. The color I use most is light yellow/green, which perks up any area it's applied to.

Noch sells an applicator for its product: a plastic squeeze bottle with a refrigerator magnet wrapped around

COLORING SAWDUST FOR SCENIC TEXTURE

Who in his right mind would want to spend days sifting, dying, and drying sawdust to make texture for a model railroad? I did—more than once. At the time, few options existed for the scenery builder who wanted a variety of textures.

Nowadays, hundreds of manufactured texture materials are available for all the popular scales. But folks still ask me about coloring sawdust, and some brave folks even do it. The advantage of sawdust is that it gives you yet another texture for your scenery bag of tricks.

You'll need 50 or so pounds of clean sawdust. About half gets thrown away, so get plenty; leftovers can be used to mulch the garden. "Clean sawdust" means sawdust that's free of Masonite and particle board chips. This may be hard to come by. I once found a place where new houses were

being framed, and clean sawdust was free for the asking.

You'll need the following tools and materials: a 5-gallon plastic pail, rubber gloves, newspapers, a 2'-long stick, a large window screen, and several quarts of green water-based paint. (Look for returned green paint in the bargain aisle of your paint store or home improvement center.)

Pour the lightest green paint into the bucket. For 1 part of paint add 5 parts water and stir until completely mixed.

Now add the sawdust, a handful at a time, and stir. Keep adding sawdust until most of the paint is absorbed.

Grab a handful of wet sawdust, and squeeze as much paint as possible out of it and back into the pail. Spread the sawdust on several layers of newspaper and let it dry. To speed drying, use lots of newspaper

and make the thinnest possible layer of sawdust.

After some of the paint has drained from the sawdust, spread it on a raised plastic window screen. Put a wad of clean newspaper under the screen. Allow the sawdust to dry for several hours.

As the sawdust dries, push it through the window screen with your hand to remove large pieces and break up lumps. Discard any pieces of wood that won't pass through the window screen. Allow the sawdust to dry completely.

Place the dry sawdust in plastic food storage bags labeled with the paint color and manufacturer. This makes it easy to duplicate a color later.

If you're still in the mood, refill the bucket with a darker green paint, add more water, and repeat the process.

the neck. In theory, the magnet is supposed to align the rayon fibers so they come out of the bottle parallel to each other and stick upright to glue spread on the scenic base. In practice, this works some of the time, depending upon how full the bottle is and how hard you squeeze it.

Apply flocking after all other scenery work is complete, and add it only to areas where it can be seen and appreciated. Give the scenery a squirt or two of hair spray, puff on the flocking, and add another squirt of hair spray to seal it in place.

Bonding textures to the layout

The easiest way to apply model dirt or other textures to your layout is to sprinkle them directly into wet earth paint. The textures can be green grass, a mixture of grass and fine gravel, or mostly gravel, depending on where your railroad operates and the look you want.

Work in one area at a time to make sure the paint is still wet when the texture is applied. Let the paint dry overnight. After the paint dries, vacuum up any texture that did not stick to the paint. Add more dirt later if desired;



The variety of colors and textures surrounding the happy golfers in this scene shows how a few basic materials can be used to model almost any type of scene.

sprinkle it on and seal it in place with a squirt of diluted white glue or matte medium bonding spray.

If you painted the scenic shell a while ago and did not add texture at the time, you can add it later. Brush on matte medium or white glue diluted with an equal part of water. Spread the glue everywhere you want texture. Sprinkle

on the dirt or scenic foam until all the glue is absorbed.

If you want more foam or texture, sprinkle it over the first layer. Then spritz all the texture with a plant sprayer filled with wet water (see sidebar on page 34). Spray gently so you don't blow the texture away!

Next, soak the texture with matte

medium bonding solution applied with a plant sprayer. Spray on enough bonding solution to soak the texture. Even more texture, static grass, or flocking can be added while the bonding solution is wet.

Add a heavy application of scenic foam to the edges of the layout that will receive a lot of wear and tear. Finish up

with a few different shades of green foam, chopped lichen, small rocks, sticks, and other textures.

When everything is where you want it, wet the texture and apply diluted matte medium with an eyedropper or sprayer. Absorb excess matte medium by sprinkling on more foam.

Spreading the foam can be done in any number of ways. Some folks like to use kitchen sifters, coffee cans with holes poked in the lid, empty spice jars, or shaker jars. Use whatever you like; I just sprinkle on the texture with my hands. Store leftover textures in their original containers or in ziplock plastic bags.

PRESERVING AND COLORING LICHEN

Folks still want to know how to process lichen and use it on their model railroads. Usually, the people who ask have found a free supply in their backyard, at their summer home, or at a vacation spot. The allure of all that beautiful tree and foliage material free for the taking is sometimes overwhelming.

Picking lichen may be prohibited in some areas, however, so be sure to check if you can remove it. Also be aware that lichen grows very slowly. If you pick it all from an area, it probably won't grow back in your lifetime.

Picking lichen

Lichen grows in wooded areas all over the world, but it prefers a cold, damp environment. I've seen it all over North America, from central Florida to the Arctic Circle.

For your lichen-gathering safari, you'll need the following:

- Plastic bags
- Work gloves
- Heavy-duty scissors
- A supply of bug spray

Pick the lichen carefully, especially if it's dry, and put it in the bag. Try not to crush it while you're picking or transporting it. Take the bag to a spot in the woods where you can empty the contents onto a picnic table, the back of a truck, or a large, flat rock.

Allow plenty of time to sort the usable lichen from the pine needles, bugs, sticks, leaves, and rabbit pellets. The coarse portion on the bottom of the lichen should also be discarded. Clip the bottom half from the lichen clump with scissors and throw it away. Give the top a good shake, and return it to the bag. You'll throw away about two-

thirds of what you pick. Leave the debris to mulch the forest, and bring home just the fine lichen tops.

Processing lichen

Unprocessed lichen will not keep; if you store it in plastic bags, its high moisture content and natural yeast will cause it to grow mold and get slimy in a very short time. Once that starts happening, there's no way to save it, and it should be tossed back into the woods. If you remove it from the bag and let it air dry, it will get hard and brittle and will crumble as you handle it. It must be processed as soon as possible after picking while it's still soft.

I process lichen outdoors to keep the heat and mess out of the house. You'll need a picnic table and a camp stove. Put the biggest tub or pot you have (it should hold at least five gallons) on the stove, and pour in the basic lichen preserving solution, starting with 3 gallons water and 1 gallon of commercial-grade glycerin.

Finding someone who'll sell you a gallon of glycerin is a chore. Emphasize that you want commercial-grade glycerin. You do not need pharmaceutical-grade glycerin, but it may be all you can find. Buy the cheapest you can find; it will still be expensive. Check the Internet or yellow pages for a local chemical supplier.

Dissolve 1½ packets of green powdered fabric dye, such as Rit or Tintex, in the basic preserving solution. To give your lichen realistic variety, get all the green dye colors that look like foliage, plus several shades of yellow. Dyes are sold at most grocery, hardware, craft, and fabric stores. You may need to check several stores to find one with a large enough selection to have the colors you need. Rit has a useful website at www.ritdye.com that includes a

color chart and information on diluting and combining dyes to get different colors. You can order dye directly from the website if you can't find the colors you need elsewhere.

Start with the lightest dye colors. As you dye each subsequent batch of lichen, replenish the glycerin and add a slightly darker dye. Heat the glycerin, water, and dye solution almost to its boiling point. The ideal temperature is about 210° Fahrenheit—close to a simmer.

Stuff as much lichen into the pot as the solution will hold, continue heating to return the solution to a simmer, and simmer for 5 minutes. Remove the pot from the stove and set it aside to cool.

When the solution has cooled enough that you can stick your hand into the liquid, remove the lichen. Wearing heavy rubber gloves, grab a big handful and squeeze out all the liquid you can.

Reheat the glycerin solution to process the second batch, replenishing it with 1½ pints of fresh glycerin and a packet of the next darker shade of dye. I usually pick enough lichen that processing it takes an entire day. The last batch should be the darkest, almost blue-green.

Drying lichen

When you remove each batch from the pickling solution, spread it on newspaper to dry and turn it frequently. I like to do this outdoors in the sun. Even so, the processed lichen may take two or three days to dry. At night, I return the lichen to plastic bags and bring it indoors. When squeezing a piece of processed lichen no longer leaves visible moisture or green color on your fingers, it's dry enough to store or to install on your layout.



Realistic rocks can turn an ordinary railroad scene into one that folks will want to visit again and again. The rocks on the author's Pennsylvania Railroad Middle Division HO layout are all plaster castings made with rubber molds.

Rocks and rubble

Some modelers go to extreme lengths in the quest for realism in the rocks on their layouts. I've seen hand-carved rock faces that looked as if a sculptor had copied the bare walls of stone quarry. I've also seen pieces of actual stone meticulously built into model railroads; it stood out and didn't blend with the rest of the scenery at all. All of this work isn't necessary; like other aspects of model railroad scenery, rocks don't need to be photographically perfect copies of the real thing. It took some years of experimentation before I developed a simple way to paint rocks so they look real, but making rocks is now my favorite part of building scenery.

This chapter could have been placed before Chapter 3 because rocks should be added right after the scenic shell is completed. I put it here because you need to become acquainted with adhesives and paints before making rocks. In this chapter, I'll discuss several ways of fabricating rocks and giving them realistic finishes.



Lightweight spackle can be used to make hand-carved rocks. It's easy to work and shape, and texture can be applied to the surface as it hardens.



Spread the spackle over the scenic base and carve rock shapes. Chip away at the spackle until the surface looks right. Reference photos are a big help in this process.



These rows of columnar basalt on Steve McKeon's N scale Spokane, Portland & Seattle railroad were made by casting plaster in a rubber mold. The castings were then hot-glued in place and finished by working Sculptamold on top of and around each piece.

The fastest and easiest way to make rocks is to mold them in plaster, using flexible rubber molds made from appropriately detailed real rocks. Model railroaders have used this method for nearly three decades now. Rock molding is pretty much an integral part of every scenery builder's construction process nowadays. However, some modelers still occasionally use another method: carving rocks in plaster.

Carving rocks

In the beginning, before many of the people reading this book were born,

modelers made representations of rocks by troweling on a thick coat of plaster and carving it to look like a rock outcropping. You didn't have to be a sculptor to get good-looking rocks, but you did have to work until you got results that pleased you.

You may occasionally encounter a situation where this method is necessary, so I'll describe it briefly. Mix up a stiff batch of plaster. Mix only what you think you can work with during a 10-minute period—for me that's about 2 cups of mixed plaster. Wet the scenic shell with wet water (see page 34) from a

spray bottle. Trowel the plaster onto the scenic shell about 1" thick. Make rough shapes by working the wet plaster into lumps and bumps.

As the plaster starts to set, chip at it with a hobby knife or screwdriver (some folks use dental tools or a wire brush—it doesn't hurt to experiment with different tools) until you get a rough, ragged look that pleases you. The easiest rock face to model is stratified rock, such as limestone or shale. Use the hobby or putty knife to make horizontal grooves in the plaster surface.

Chip away here and there at some of the plaster on the vertical slopes to get an uneven look. Brush the rock surface with an old toothbrush to clean the rock and check your progress. Save the plaster chips to color and glue to the base to look like fallen rocks.

I've also substituted lightweight spackle for plaster. Spackle sticks to most surfaces, doesn't shrink or crack, and sets hard overnight. Use spackle as you would plaster, but be aware that because it's softer, you shouldn't apply too much pressure to it.

For most applications, you'll find it easiest to cast rocks from rubber molds.

Casting rocks in molds

Excellent rock molds are available commercially, so you don't have to make your own in order to enjoy the benefits of this technique. However, mold making is easy and fun, so I'll describe the process.

My introduction to mold-making and casting came from an article in *National Geographic* showing Egyptian petroglyphs being preserved by making molds of them. Castings were made from the molds to create duplicates for scholars around the world to study. It was obvious that this could be a great technique for duplicating rocks.

Aluminum-foil molds. Latex rubber to make molds was too expensive for my teenaged budget, so I tried making rocks in crumpled aluminum foil, a method still popular today. It's simple: Cut a piece of heavy-duty foil a little larger than the rock face you want. Crumple the foil, then smooth it out a little to leave a craggy surface. Form the edges to make a shallow dish and fill the mold with plaster. After the plaster dries,

remove the aluminum foil.

Aluminum foil can also be formed over real rocks to make a simple mold. Although the casting won't have as much detail as the original, it can be a good representation of the rock.

I use aluminum-foil castings for special areas where a lot of surface detail is not needed, like interior tunnel walls, where a blasted-stone look is desirable. Cast and paint the walls while they're on the workbench, then hot-glue them in place behind the tunnel portal before the scenic shell is complete.

Rubber molds. The sidebar on pages 44-45 explains how to make your own molds. The following casting instructions apply to both homemade and store-bought molds. If you don't have the time or the inclination to make your own molds, investigate those offered by Blue Ribbon Models, Bragdon Enterprises, and Woodland Scenics.

Rock castings can be made from molds in two ways. You do the castings at the workbench and leave the mess there, or you can cast rocks directly on the scenic base of the layout. Whichever method you use, I recommend that you use only plaster to make the castings, because it will reproduce fine detail.

I'm using the word "plaster" interchangeably for molding plaster, patching plaster, plaster of paris, and HydroCal. The only significant differences between these materials are hardness and setting times. For modeling rocks, neither matters much.

Casting at the workbench

Fill each mold with plaster at the workbench, let the plaster harden, and save the castings for later.

By working at the workbench, you have the advantage of making and coloring the rocks before your scenery is in place. This is particularly beneficial if you are still experimenting with casting and coloring or if your scenery is not yet ready for rocks.

The simplest way to support the mold is on a pile of old towels or in a box full of Styrofoam packing peanuts. Position the mold so the sides are level and raise the low areas to keep the plaster from running out. Spray the interior of the mold with wet water to eliminate air



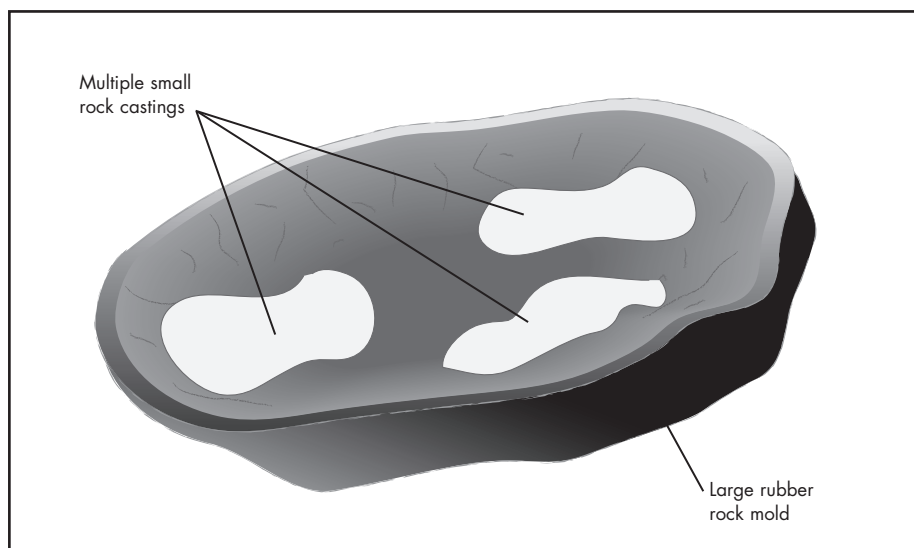
The basalt pieces have been pre-painted and glued in place. The Sculptamold has been textured with a stiff brush to show soil erosion. Steve McKeon layout



The masters for the basalt formations were made of many smaller pieces cast in Durham's Rock Hard Water Putty, a fine grade of plaster available in hardware stores.



Bob Hayden made these latex molds to cast the basalt outcroppings on Steve's layout. These formations are modeled after a prototype found along the Columbia River.



Small rock castings can be made by pouring plaster or polyurethane casting material into portions of a larger mold. Small castings are great for creating an assembly of many different rock faces that don't look anything like the mold they came from.

MAKING YOUR OWN ROCK MOLDS

Excellent rubber rock molds are now commercially available, so you don't have to produce your own. However, mold making is easy, fun, and relaxing. In addition, many modelers want to duplicate specific types of rocks found on the prototype that they're modeling.

Molds can be made outdoors, using rocks where you find them. I did this for years, always getting curious stares from passersby. But the time involved, not to mention the inconvenience and need for perfect weather, argue against making molds outdoors.

Instead, I gathered small rocks and large chunks of coal (harder to find nowadays) to bring home for mold-making. The main requirement was that the rocks have a lot of fine detail.

Making the mold

To make molds at home, you'll need liquid latex rubber, an air-curing rubber that dries strong and flexible. The brand I use is called Rubber Latex and is made by American Art Clay Company. It's sold in art supply and craft shops. Buy only one or two pints at a time; the shelf life is just a year or so.

You'll also need cheesecloth from a fabric store or surgical gauze from a pharmacy. This material serves as reinforcement for the rubber and gives the mold strength to help it hold its shape. Have several inexpensive 1½" China-bristle brushes on hand, as well as a pair of scissors.

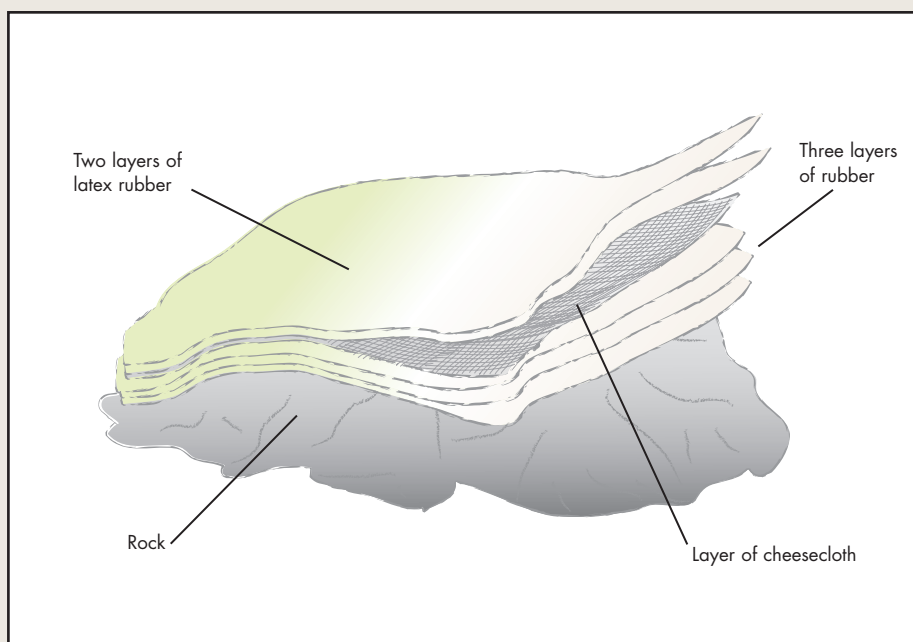
Wash the rock face with a wet brush to remove soil, crumbling rock, and vegetation. Leave the surface wet.

Apply the first coat of rubber with the wet brush. Spread a thin coat over the surface and into all the crevices. The latex rubber I use is white and stays that way when it dries.

Allow the rubber to extend beyond the edge of the mold area by 1". Trim away the excess after the mold is complete. The shape of the mold is unimportant as long as it has a slightly cupped shape to hold plaster and is big enough to capture all the rock's fine detail.

Each time you use the brush, wet it to keep the rubber from adhering to the bristles. Wash the brush in warm water after each application.

After the first coat of rubber dries, apply a second coat and allow it to dry overnight. Then brush on a third coat and let it dry.



Making your own rock molds involves building up multiple layers of liquid latex rubber sandwiched around a reinforcing layer of cheesecloth.



Take your time when applying the first coat of rubber on your rock master. Apply a thick, even coat, making sure to fill all the nooks and crannies of the rock surface. To allow for trimming the completed mold, make the mold about ½" larger all around than the item you want to cast.

After three layers of rubber, the mold is ready for reinforcing. Cut a piece of cheesecloth a little larger than the mold. Several strips can also be used to cover odd-shaped rocks. Apply a fourth layer of rubber and push the

cheesecloth into it with the brush.

Make sure the cheesecloth is tight to the rock and covers the entire mold. Spray the cloth with wet water and apply another layer of rubber on top of the cloth.



After three or four thick layers of rubber have been applied it's time to add the cheesecloth. Cheesecloth is sold in fabric stores by the yard. Cut a square of cloth larger than the mold, lay it on the wet rubber, and push it into the wet rubber with your brush.



Wet the cheesecloth with wet water to make the gauze snuggle down on the rock. Cover it with another coat of latex. After the latex dries, apply two more coats of latex to seal the gauze.



After the rubber has dried overnight, grasp one corner and slowly peel it from the rock. There will be a lot of resistance at first, so take it slow. The cheesecloth will keep the mold from tearing.

You'll need one or two more layers of rubber to complete the mold. Allow each layer to dry thoroughly—for two or three days—before removing it from the rock.

To remove the mold, start at one corner

and gently pull the edges up and over the rock. When all the edges are free, work toward the center, carefully pulling the rubber free without tearing it. Trim ragged edges with the scissors.



Here's the completed mold, ready to have its edges trimmed smooth. It has picked up a little dirt from the surface of the rock, which can be removed by washing the mold.

Store the mold so that it holds its shape. I put each mold in a ziplock plastic bag. Allow air to stay in the bag when you close it so the air pillow will protect the mold.



Use Sculptamold to fill in around rock castings to blend them together and into the surrounding scenery. Several different types of foam rock castings were used here. Joe Galdi layout



These rock outcroppings were made from several identical castings. The castings were cut apart, and the pieces were arranged on the layout so that identical patterns were not evident. Joe Galdi layout

bubbles on the surface of the casting.

Mix plaster and fill the mold. You can make castings ahead of time and apply them to the layout at your convenience. You have a 100% chance to get good, usable castings this way.

I use the workbench method for all of my rock castings these days. I like making groups of smaller castings rather

than a few large ones. I don't fill the mold. Instead, pour many small, flat puddles of plaster in the mold to make small, thin, tile-size castings. I first tried this method when I built the Pennsylvania Railroad Middle Division project layout for *Model Railroader* magazine. The advantages are that you can use all parts of the mold—even out

to the edges—and you get many near-perfect castings from each mold.

Attaching castings to the layout

I use Gypsolite and Sculptamold like mortar to “cement” rock castings in place. Gypsolite will give you about 45 minutes of working time; Sculptamold offers only about 15 minutes.



If you look closely, you'll see that this shale outcropping is made from two identical castings placed side by side. After grass and shrubbery are added, the similarity will disappear. Dick Rotto layout

Using small pieces of rock allows you to “art direct” the look of the finished rock face, something you can’t do with large, solid castings. Lay out the castings on the scenery and move them around until the arrangement looks good. Keep them close together, and fit smaller rocks among larger ones, making sure that the rock strata slope in the same direction and that similar faces are adjacent to each other.

If the castings don’t quite fit, break or snip away the offending parts with fingers, wire cutters, or a matte knife. You don’t have to be fussy; the fit doesn’t have to be perfect. The mortar will fill the cracks between the rocks with realistic texture.

When you remove the castings, set them aside in the order of placement on the layout. Spray the scenic shell where the rock castings will go with wet water. Trowel on a $\frac{1}{4}$ " layer of Gypsolite or Sculptamold mortar to cover the area.

Wet the underside or back of the rock casting by dipping it in a shallow dish of water, then trowel on about $\frac{1}{8}$ " of mortar. Position the casting where you want it, and wiggle it gently into place to set. Repeat the process until all the castings are in place.

Excess Gypsolite or Sculptamold will ooze around the edges of the castings. Remove this with a wet brush or a squirt of water. Mortar around the edges of a casting can be spread out to hold the next casting or to add texture and strengthen the scenic base. Use the wet paint brush to smooth, shape, and texture the areas between the castings.

If a casting cracks or breaks while you’re placing it, just fit the pieces together and push them into the scenic contour. Nobody will ever notice the crack when the scene is complete.

Keep adding castings to finish the scene. Repairs or changes can be made up to 20 minutes after the castings are applied.

Casting rocks in place

The advantages of casting rocks in place directly on the scenic base are that you can make the rocks conform to uneven terrain and, after the castings are in place, you can color the rocks when you color the rest of the scenery.



Using poultry fencing as the scenic base made it easy to hang rock castings to build this nearly vertical mountainside on Joe Galdi’s layout



To cast rocks in place on the layout, begin by levelling the rock mold on your workbench and filling it with plaster.



When the plaster’s surface turns from wet and shiny to dull, carefully lift the mold and invert it onto the scenic base. Here, the author first coated the scenic base with extra plaster to make a flat surface.



Hold the mold in place for 10 or 15 minutes until it gets warm. Then lift one edge to peek at the casting. The plaster should be hard enough so you can remove the mold without damaging the casting.



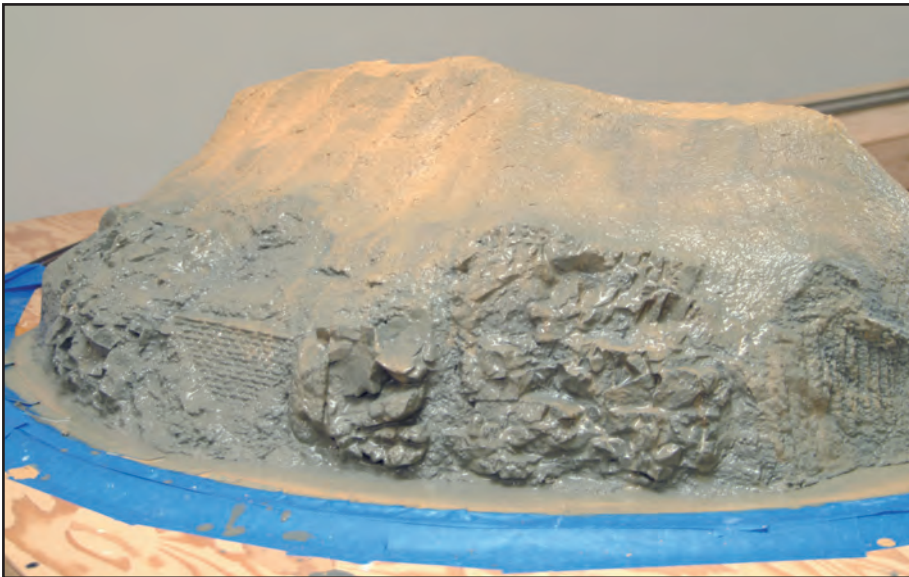
When joining two or more castings, blend the overlapping edges by carving and scraping to remove the seam. It’s easiest to do this while the plaster is still damp.



Almost any rock color can be simulated by mixing combinations of four acrylic colors: titanium white, black, raw umber, and raw sienna.



Here, the basic scenery black has been dry-brushed with the earth color to tone down and blend the two colors together. Joe Galdi layout



After the black was painted on these rocks, it was dry-brushed while still wet with the earth color to tone down the intensity of the black on the rock faces.



When painting rocks at the back of the layout, it's a good idea to mask the area behind the rock with blue painter's tape to prevent the rock color from marring the background. Dick Rotto layout

The shape of rock faces can be varied by pressing and distorting the mold. If you have an oddly shaped area or need to bring a rock face up to the edge of a bridge abutment, wall, or backdrop, trim the edge of the mold with scissors. If you need smaller rock castings, fill just a half or a third of the mold with plaster or cut the mold to the desired size.

Fill the mold with plaster and allow it to set slightly. Tap the sides of the mold to dislodge trapped air bubbles. Place the mold on the scenic base just as the plaster loses its soupiness but before it becomes inflexible.

Hold the filled mold in the palm of your hand and push it onto the pre-wet scenic base to make it conform to the contours. Hold it in place for several minutes until the mold gets warm and the plaster feels hard. Let go of the mold and wait 10 minutes for the setting process to continue.

After 10 minutes, peel back one corner of the mold to see if the plaster has set. If the mold looks clean, with no plaster clinging to it, it has set enough for you to carefully remove the mold.

Trim the damp rock casting with a palette knife or butter knife to fit it to the scenery contour. Slice and scrape the edges of the casting, but be gentle—you don't want to damage the casting or crack the scenic base. Use the tip of a hobby knife to finish the edges. Fill holes or gaps in the casting with leftover plaster.

Now, install a second casting next to the first. Wash the mold to remove clinging plaster, re-wet its surface, and repeat the procedure. When you remove the mold from the second casting, start by peeling at the edge that overlaps the first casting.

The second casting should fit the contour of the first. Use a jabbing and twisting motion with the palette knife to break away pieces of the new casting that do not blend well. With the tip of a hobby knife, pick away excess plaster and carefully blend the two castings together. Repeat this process until the rock face is complete.

The principal disadvantage of this method is that you have to hold the mold in place until the plaster sets. This is tiring, especially if you're working from a step ladder.



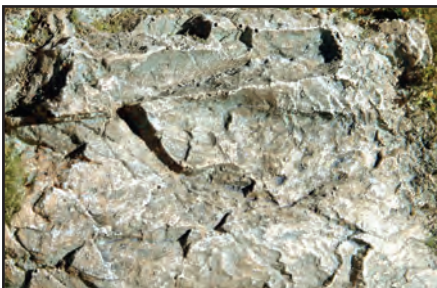
The rocks in the foreground in Gore Canyon on Joe Galdi's layout have been painted, and some of the greenery has been added. The middle and background rocks have yet to be painted.



Here's a mixture of foam rock castings and real crumbling rock gathered from the side of the highway. The crumbling rock has been glued in place, painted earth color, and dry-brushed with a lighter earth color. Dick Rotto layout



Create the illusion of depth and big, rugged rocks by first accenting the shadows with a black wash applied to the undersides of the outcroppings. Then dry-brush white on the raised to increase the light-against-dark effect. Dick Rotto layout



The author wanted this small casting to look like granite, so he dry-brushed it with cerulean blue mixed with a little gray (black and titanium white) before dry-brushing with titanium white, raw sienna and raw umber. Bob Hayden layout



The first colors painted on the rocks to blend them together are basic scenery black, followed by dry-brushing with earth-colored paint while the black is still wet. Joe Galdi layout



Pre-paint large rock pieces that will go in hard-to-reach places with flat black. When the paint dries, this large rock will be cut up into smaller pieces. After the pieces are installed, the accessible areas can be painted with basic scenery black.



To make life easy, the author painted this hard-to-reach tunnel portal before mounting it in the scenery. When the rest of the scenery construction was done, it required only touch-up painting. Dave Willis layout

UNIVERSAL TINTING COLORS

I learned about universal tinting colors from a series of articles—later a book—by John Olson. John built used tinting colors to color the rocks and scenery on the HO scale Jerome & Southwestern railroad he built for a series of articles *Model Railroader* magazine many years ago.

Universal tinting color is a concentrated, water-soluble coloring agent, consisting of color pigment, water, and a very small amount of binder. Universal tinting colors are inexpensive, and a 1½-ounce tube will last for more than one model railroad project. The colors are available at most large paint stores. Here are the colors most useful for model railroaders:

- Burnt sienna
- Burnt umber
- Gold
- Mars black
- Medium yellow
- Raw sienna
- Raw umber

The beauty of tinting colors is ease of use. Just fill a plastic container with ½ cup of wet water and add a drop of color to it. Mix well with a brush—add more drops as needed to get the color you want—and you're ready to paint it on. You can also

apply the mixture with a plastic pump-type spray bottle.

If the stain is too dark, add more water. If it's too light, add one or two more drops of color. This thin stain is good for coloring plaster rocks and for weathering other areas of your layout.

John's technique involved spraying plenty of stain on the rocks or scenic shell, then washing off the excess with plain water from a sprayer. The water removes some of the color and washes the rest into the nooks and crannies of the scenery.

I've taken John's technique a step further by first spraying white plaster castings with basic black wash to tone down the plaster and add dark color to the rock shadows. Next, I spray or brush on the tinting color wash and allow it to dry.

You may have to apply several coats of the tint to get the color depth you want. Evaluate the color after the plaster has dried. Once the casting has completely dried, the rock surface can be dry-brushed with earth or white.

I've also used tinting colors to pre-color plaster and Sculptamold. Add a drop or two to the water before mixing with the dry plaster. This will color the plaster without weakening it. Experiment to get the intensity of color that pleases you.

After the casting sets, you may find that it did not turn out exactly as planned. Perhaps an air bubble was trapped in the mold or part of the mold didn't fill properly. Fill the hole with more plaster or scrape the casting away, mix more plaster, and start over.

Coloring castings

Coloring rock castings is not art. It's simply a matter of finding colors that look like the rocks of the prototype you're modeling. Or, if you're a free-lancer, it means finding the colors that will fit in with the terrain of your layout and will please you.

I like my rock colors to be a little lighter than prototype colors. This compensates for their being viewed under relatively weak indoor lighting. I prefer to color rocks just after the plaster has set, while the castings are still damp. If you made castings on the workbench and they have dried, re-wet them by soaking them in water until bubbles stop coming from the face of the casting.

Coloring with washes

Rocks can be colored in lots of ways. Here, we'll look at using paints, washes, and acrylics.

One method uses flat indoor wall paint thinned with water. First, spray the damp castings with a black India ink wash (see Chapter 3). This can be done as soon as the mold is removed. The black wash will color the white plaster and add relief to the rock face. Spray until the wash drips off the casting, then spray more black wash into the deep crevices, under overhangs, and anywhere there's a deep shadow.

Second, while the wash is still wet, spray or brush on the earth-based rock color. The colors will blend, yielding natural results. Next, brush or spray the rock shadow color into all the deep areas of the casting. You don't have to be fussy here, just slop it on. Allow the casting to dry a little and brush on the rock highlight color. Apply this only to the outer and upper surfaces of the rocks.

Let the castings dry overnight before you evaluate the coloring. If the color is too light, re-wet the casting and repeat the coloring procedure with darker colors. Don't be afraid to spray more of the black wash into the shadow areas



Blending scenery and rocks into the backdrop is easy: Just carry the same colors used on the rocks, grass, and soil up and into the background. Dick Rotto layout

until they become dark. Repeat the steps if the rock still looks too light.

Shadows and highlights

I like to paint shadows a second time, after the castings are somewhat dry, to reinforce the appearance of depth. Do this under your normal railroad room lights and brush the rock shadow mixture into the dark areas. Paint with a dabbing motion to blend the shadows without leaving telltale brush marks. Let the castings dry.

The finishing touch is to dry-brush the rock highlights with titanium white acrylic or flat white wall paint to emphasize surface detail.

Pick up a little paint on the tips of the brush bristles, and then scrub off most of the color on a cloth or paper towel. You can tell when you have the right amount of paint by brushing lightly on the palm of your hand. You should see only light coloring of paint on the whorls of the skin.

Practice is the key here. Apply too much paint, and you'll have unrealistic white streaks on the rocks that you'll

have to wash away with a wet brush. Too little paint won't be visible at all. You want coverage between the two extremes with paint that just barely highlights the surface of the casting.

Brush from top to bottom on the topmost surfaces of the rock, adding white only on raised surfaces. The object is to add a lighter color to the parts of the rock face that would be struck by sunlight. Keep adding paint to the brush, wiping most of it away, and lightly dry-brushing the surfaces until all the highlights are accented. Be careful not to add too much white—you don't want your rock faces to look "frosted."

After the rocks dry completely, dust them with powered pastel chalks for a final blending effect.

Polyurethane foam rocks

Pre-cast polyurethane foam rocks are finding wide acceptance among scenery builders. Lightweight and easy to work with, these realistic rocks can be installed on any scenic base. Lately, I've begun using polyurethane rocks on commercial train displays, modules, and custom-

built model railroads. They are easy to install, color, and detail.

Foam rock castings come in two varieties. One is soft and light and can be cut and shaped with a hobby knife or hacksaw blade (these castings are usually honey colored). The other type, made from a hard foam usually painted gray, are quite dense and must be shaped with a hand saw or power saw.

These rocks can be used as-is or cut into smaller pieces. A benefit of cutting the castings into smaller pieces is that it creates rock faces different from the original castings, adding variety to your rocks. The smaller pieces can be arranged to look like any type of real rock.

Remove excess material from the backs of the castings to make them thinner and easier to handle. This is easy to do with a crosscut saw or a band saw. The thinned rocks will "snuggle" more easily onto curved surfaces like hillsides. Once thinned, the castings are also easy to break into smaller pieces along their fault lines.

Dry-fit the castings—or pieces of castings—on the scenic base. The fit need not be precise; gaps can be filled



Castings speed up construction when you need large expanses of rocks. The left side of this canyon was made entirely from polyurethane rock castings cut, fitted, and hot-glued together. Gaps were filled with Sculptamold and then painted with basic scenery black.



Foam rocks look like this when you buy them. The largest piece can be used as-is or cut into smaller pieces, which can be positioned on the layout in any combination or pattern.



These foam rock castings were hot-glued directly onto the cardboard strip framework. Slivers of foam rocks form the riverbanks. Joe Galdi layout



Many different types of foam rock castings were pieced together to make this scene. Prototype photos are an invaluable aid for rock placement and color selection. Joe Galdi layout



After the foam between these rocks sets (usually overnight), the excess will be cut away with a sharp serrated knife. The exposed foam will be sealed with a light coat of Sculptamold to provide a good painting surface. Joe Galdi layout



Sometimes it's easier to work with foam rocks if you cut them down. Here, a bandsaw was used to cut off the back half of this casting. Thin castings can be easily bent and broken to fit almost any contour.



Bob Hayden is fitting large pieces of rock together to make a wall of rocks stiff enough to withstand visitors and operators passing through this aisleway. The pieces were painted with basic scenery black before installation. Joe Galdi layout

later. Arrange the rocks so they look natural and the fault lines are roughly parallel. Don't be afraid to break the castings to make them conform to the curve of the hillside.

When you're satisfied with the rough placement, attach the castings to the scenic shell with a bead of Liquid Nails or a blob of hot glue. Both adhesive

materials set slowly enough to allow you to reposition the rock pieces.

To hold a heavy casting in place until the glue sets, push a 3" finishing nail under it. Sticks, pins, and weights can also be used to hold the castings in place.

Mix Sculptamold according to package directions and trowel it between and around the castings to blend them into

the hillside. Use a wet brush to push and smooth the Sculptamold between the castings. If you get Sculptamold on the rock faces, wash it away with a wet brush before it sets.

Painting polyurethane rocks

Polyurethane rocks can be colored as soon as the Sculptamold sets; they need



You can build your scenery in a linear progression, starting and finishing as you work around the layout. The author installs rocks, adds Sculptamold, and paints scenery in 2'-wide swaths. Joe Galdi layout



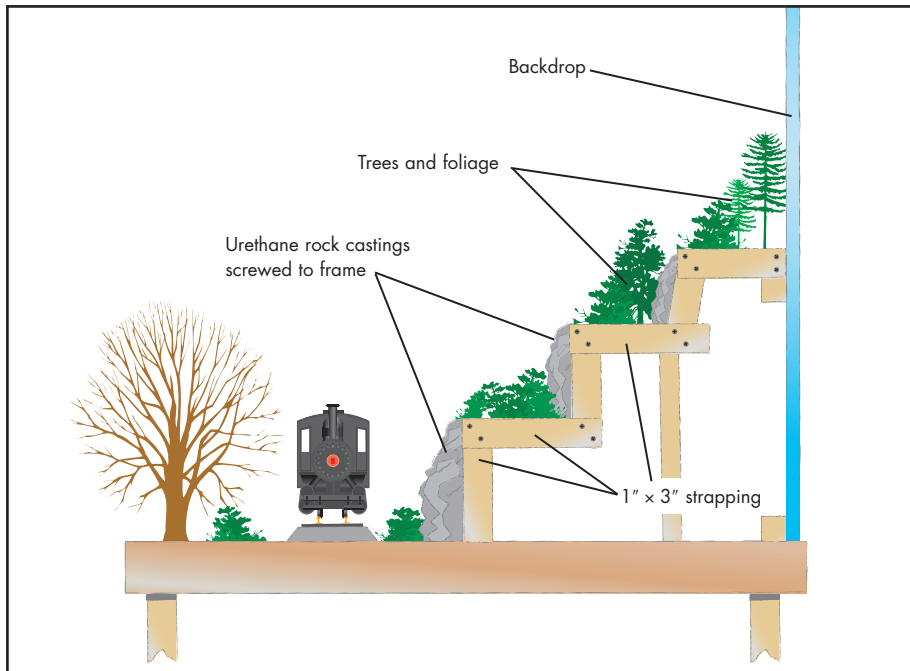
The goal here was to have an interesting foreground while providing the trains, just inches behind the scenery on the left, with enough clearance to pass into a hidden helix to the far left. Joe Galdi layout



Many mountains start out this way: The portals are installed first and the rock pieces built around them. Cardboard strips are glued between the rocks before being covered with plaster cloth. Alan Rieper layout



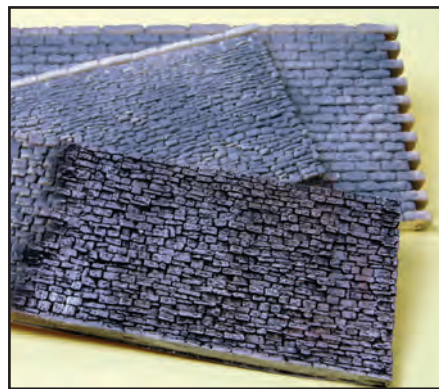
Here, a plaster tunnel portal was hot-glued to a piece of foam rock casting. The area over the portal was covered with plaster cloth. Joe Galdi layout



Popularized by George Sellios, the step method of building background scenery involves screwing polyurethane rock castings to an underlying frame made from 1" x 3" strapping.



This foam rock casting was painted using our favorite four colors: black, raw sienna, raw umber, and titanium white. It's finished with a red rock powder used to color cement and plaster.



Foam walls are available in all scales. These are HO scale walls; the front sheet has been carefully painted to accent the detail of the stones.

not be completely dry. Because the polyurethane foam is non-absorbent, the rocks have to be painted rather than stained. For the base color, mix 1 quart of basic scenery black (see Chapter 3). This makes a dirty, dark-gray color.

Apply the basic scenery black with a 2" brush, working the paint into all the nooks and crannies of the rock faces and on the surrounding Sculptamold. Work under a strong light to make sure the paint gets into all the cracks and crevices (I sometimes spray flat black automotive primer into the deep recesses to ensure coverage.) After the black dries, you'll find several spots you missed. Touch them up with more paint.

When the black dries, the rocks can be colored with tube acrylics. The colors will depend upon the geography you're modeling. A good starting palette is Mars Black, titanium white, raw sienna, and raw umber. If you're modeling the desert, add medium yellow and terra cotta or red oxide.

Squeeze a 1" noodle of each color on a cardboard palette. Now take a dry 2" China-bristle brush and lightly mix the four colors (easy on the black) until you have a light earth color. Stroke the brush over the rocks, working from top to bottom. Use a stabbing motion to apply the paint in recessed areas that are too dark. You don't have to be fussy; you just want to lighten the black color with this first application.

Mix more white into the first color and dry-brush again. Repeat with progressively lighter colors until you have what you like; reference photos are very helpful at this stage. If your rocks look too dark in the shadow areas, use a stabbing motion with the brush to get paint into the undercuts. Reddish-brown or yellow-brown colors can be streaked across the rock to look like strata.

Let each paint application dry for 30 or 40 minutes before dry-brushing on the next color.

This dry-brush technique works best when the paint has been on the palette a while and has started to get sticky. It leaves a realistic "grainy" finish on the rock surface. But if the paint gets too sticky, add several drops of water to the brush and re-mix the paint.

To finish the coloring, lightly dry-brush titanium white on the tops and

edges of the rocks. This will bring out even more of the surface texture and highlight the rocks' rugged surface.

Dry rock powders

If you want more intense color, especially when modeling scenes in the Southwest, color the rock again with dry powders. These powders are available as dry pigments from art stores and some building supply centers that sell concrete products. I prefer bright reddish-browns and yellow-golds.

Put the powders in plastic sandwich bag. With a clean, dry brush, pick up some red, orange, or yellow. Streak the dry powder across the rock face following strata lines. Be adventurous: Try different color combinations. Unwanted powder can be washed away later.

To set the powder or to remove excess, dip another clean brush in a dish of water and brush it over the dry powder. Brush in the direction of the rock strata. You'll see the color brighten and flow into the crevices. If the color comes out too bright, moisten the brush and wash away some of the pigment. Blot away excess water with a paper towel.

Allow the colors to dry, then seal the powder in place by misting with super-hold hair spray. I use the cheapest unscented spray I can find. After the spray dries, the color is almost permanent, but since the spray is water-soluble, you can still scrub away some of the color with a wet brush, if necessary.

I like rock powders because they look good under the relatively weak illumination of most home layouts and because the color will not fade over time. If you can't find rock powders, use artist's pastel chalks (available at art-supply stores). Grind them to a powder with an old flat file and apply them the same way as dry powders.

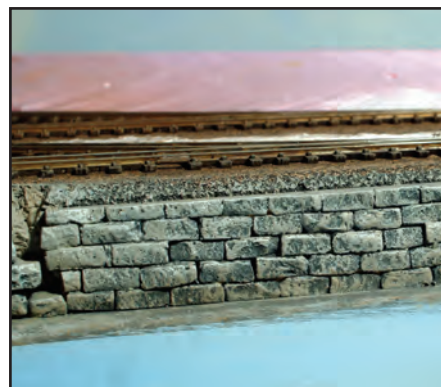
To finish the painting, lightly dry-brush the castings one last time with white to add a little sparkle. After that, decorate the rocks with vines, grass, weeds, and small trees.

Plaster rocks and boulders

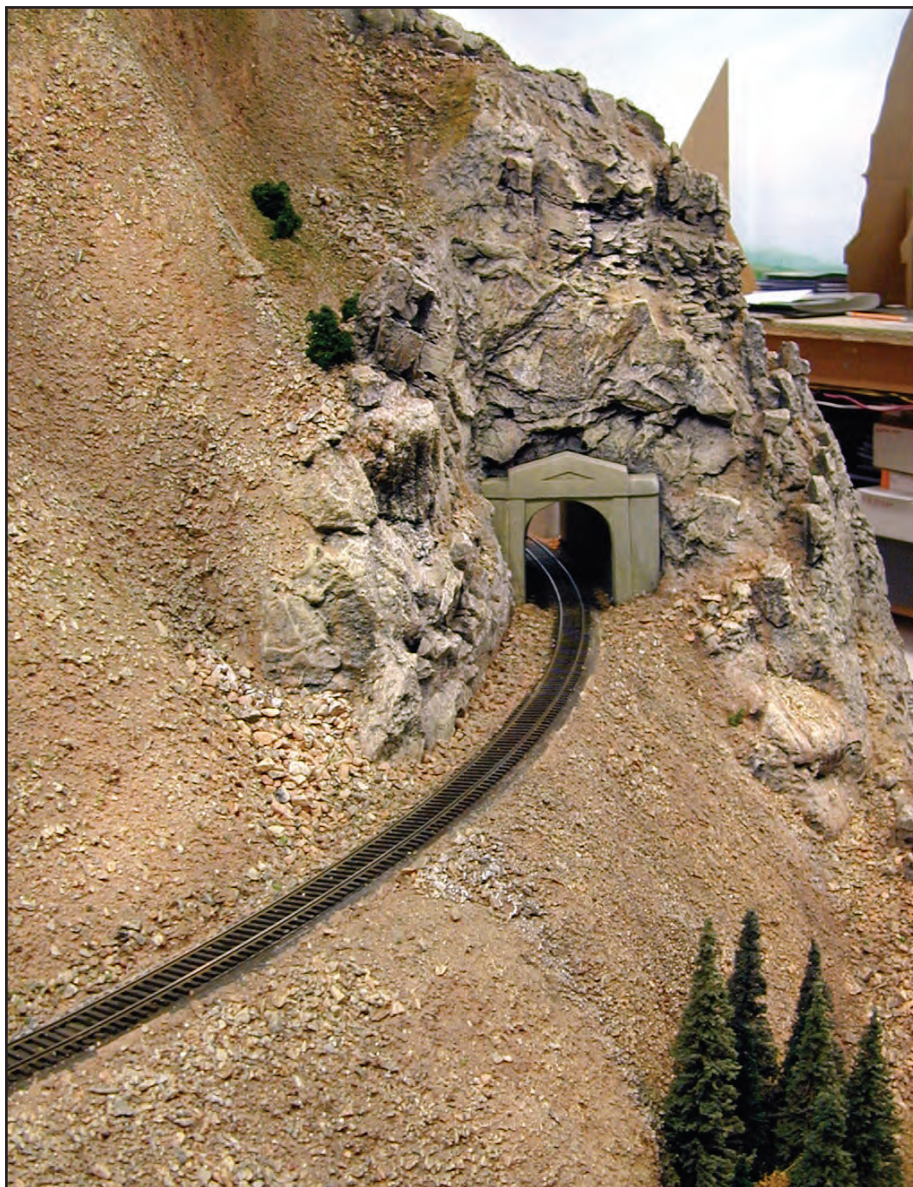
Almost every model railroad scenery supplier sells rocks to add to your layout, but to get the best color match with your landscape features, make your own stones. It's fast and easy.



This loose gravel is made from crushed, colored plaster scraps sprinkled on the layout and sealed in place with bonding spray. Grass and Woodland Scenics Earth were then sprinkled on the wet spray.



The middle level of this seawall is a plaster casting from a homemade rubber mold. Individual stones will be added to the ends of the wall so it looks like parts of the wall are crumbling away.



The soil on this scene's prototype was composed of sand, dirt, and lots of stones. To duplicate it, the author mixed decomposed granite (gathered from the side of a road), builders' sand, and vermiculite. Full-strength white glue was painted onto the hillsides and the mixture applied. Larger stones that rolled down the embankment were glued in place wherever they landed. Joe Galdi layout



This elaborate rock canyon was designed so the viewer can only see the train by looking into the canyon from either end—just as with the prototype. Joe Galdi layout

As you make castings, you'll generate a lot of plaster scraps. Save these in a plastic bag. After you have several cups, break the scraps into irregular pieces by beating on the bag with a hammer. You'll create large and small pieces and a lot of dust. Place the rubble in a coffee can, moisten with water, and pour in black wash. Shake the can until the wash covers all surfaces of the plaster pieces. Next, pour in some of your basic rock color and swirl it around. Drain off excess paint and spread the rubble out on newspaper to dry for several days. If the stones look too light, apply more black wash and evaluate the color when everything has dried again.

Sprinkle the rubble at the base of your rock castings, spreading it with a soft

brush until the look is natural (reference photos are a big help). Spray the rubble with wet water, and use an eyedropper to flow on diluted white glue or matte medium bonding solution. Let the stones dry overnight. If some of the larger pieces are still loose, glue them individually using full-strength white glue.

Finish up by spraying more black wash into the shadows and dry-brushing the tops of the rocks with white.

Retaining walls

Several years ago, I needed weathered stone walls for a railroad project. I decided to build the wall stone by stone. I remembered an old magazine article about carving a few individual stones from a slab of plaster and making molds

from them to use in casting the hundreds of stones needed to build a wall. I carried this process a step further by making a mold of the completed wall. With that mold, I could easily cast hundreds of similar walls.

You can also carve walls from solid blocks of plaster. To build texture into the surface of the plaster block before carving, glue a piece of coarse sandpaper to a block of wood, build a box around it, and pour in latex molding rubber. This generates a mold for making castings with a rough surface.

Draw mortar lines on the plaster block with a pencil and a carpenter's square and use a V-grooved dental tool to remove plaster, a little at a time, until you have a wall you like. Switch to a hobby knife to shape the individual stones. When you're satisfied, spray the wall with a heavy coat of Krylon clear acrylic spray to seal it.

Make a rubber mold of the carved block. (See the sidebar on pages 44-45 for complete information on molding and casting techniques.)

To cast plaster walls, start by wetting the mold. This helps the plaster flow into the surface irregularities, thus making a sharper casting without gaps or voids. Shake off excess water.

Mix the plaster as described in Chapter 2 and pour it into the molds until they are almost full. Shake and bump the molds to eliminate air bubbles that cling to the inner surface. Allow the plaster to set hard before removing the mold. Be careful: Wall castings tend to break along mortar lines while the plaster is damp.

Wall castings can be cut to fit different shapes, locations, and situations. For smaller wall sections, cut the casting with a hacksaw blade. Saw gently, holding the casting on a flat surface to prevent it from cracking.

Stone walls can be separated along the mortar lines by deeply scribing the back of the casting and snapping it in half. To ensure a clean break, align the scribed line with the front edge of the workbench and snap it, using the edge as a fulcrum point. Repair mistakes with white glue. Window and door openings can be cut into the castings with a sharp hobby knife. Use leftover wall scraps to make stone structure foundations.



After these rocks were painted, the stone-and-sand mixture was sprinkled on and held in place with matte medium bonding spray. Joe Galdi layout



Great Stuff foam sprayed between the castings holds these rocks together and makes the mountain a solid mass. Excess foam will be trimmed away and the seam covered with Sculptamold to blend the textures. Joe Galdi layout

Making a curved wall is easy. Fill the mold with plaster. As soon as it starts to set, place blocks of wood under each end of the mold. Raise the ends until you get the desired curve. The edges of the casting will thicken, but they can be sanded smooth after the plaster dries.

You can color walls using the same methods described for coloring rocks. Experiment with new colors on a scrap wall casting before applying them to your layout. Always evaluate colors after the plaster has dried. Don't forget to pick out individual stones with light and dark variations on your basic rock color.

Glue wall castings to the scenic base with Liquid Nails or hot glue and finish around the edges with Gypsolite or Sculptamold. When you place the wall in the scenery, be sure there's a logical reason for it's being there, such as serving as a retaining wall to hold back dirt or loose rocks that could fall on the track.

Detail the walls with bits of lichen, scenic foam, or other texture material glued in place with diluted matte medium or white glue. After the glue dries, weather the castings as you would a structure with thin acrylic washes and powdered pastel chalks.

Foam retaining walls

Several commercial sources offer pre-cast foam and resin retaining walls and bridge abutments. I use these on a lot of projects because they're easy to work with, look good, and leave no waste.

Simulated stone and concrete walls come in handy when you have a large area that needs shoring up or if minimal clearance exists between scenery and track. Scraps can be used on other parts of the scene or layout.

Foam walls can be cut with a hobby knife, serrated knife, or band saw. Solid polyurethane foam walls can be bent by warming them in a 300-degree oven for about 5 minutes. The trick is to warm the walls all the way through. If they are hot enough, foam walls will bend easily and stay bent after they cool. If they are not warmed through, they'll crack.

While the wall is in the oven, find something the correct diameter to wrap the wall around. This method works better than trying to bend a hot wall freehand.

Flexible foam walls are also available. These work great on curves or in areas that offer little clearance. These walls can be curved right on the layout. Apply hot glue or Liquid Nails to the back, push the wall into place, and hold it there with several long finishing nails. Push the nails through the corners of the wall. After the glue hardens, remove the nails and fill the holes with lightweight spackle or Sculptamold.

Pre-cast polyurethane walls are painted and finished with the same colors and techniques used on urethane foam rocks.

Building a marble quarry

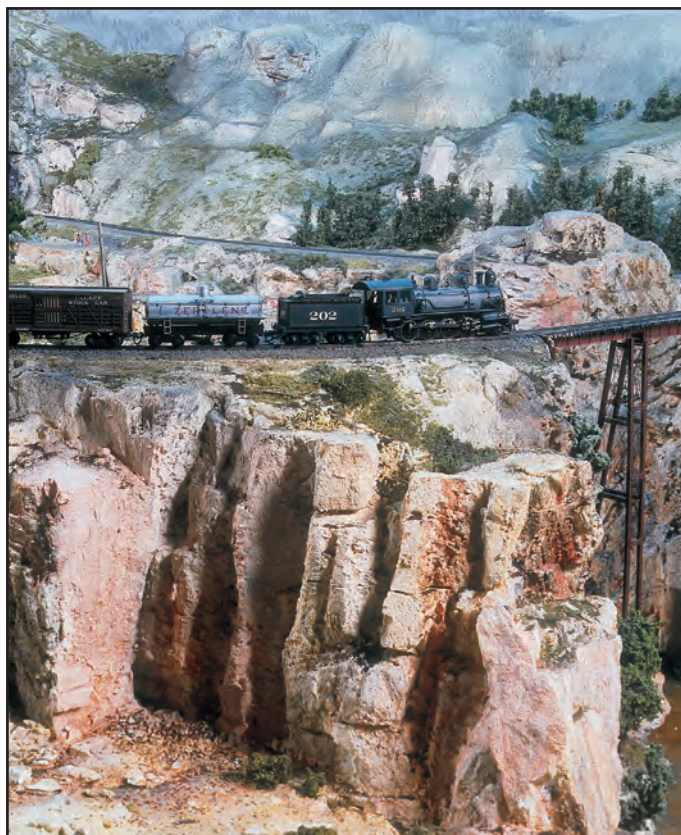
Several years ago, I built a museum display featuring railroads that ran through Vermont. One of the lines served a marble quarry. I thought it would be fun and different to build a model of the quarry (greatly reduced in size, of course).

I puzzled for several days as to the best way to proceed. I finally decided to try integrating 2" Styrofoam and plaster rock castings. I sawed the Styrofoam into 1/4"-thick strips. The strips became the "steps" of the quarry. The coarseness of the saw blade gave the edges of the strips a rough, jagged look, much like the sides of a real quarry where drilling equipment leaves its mark.

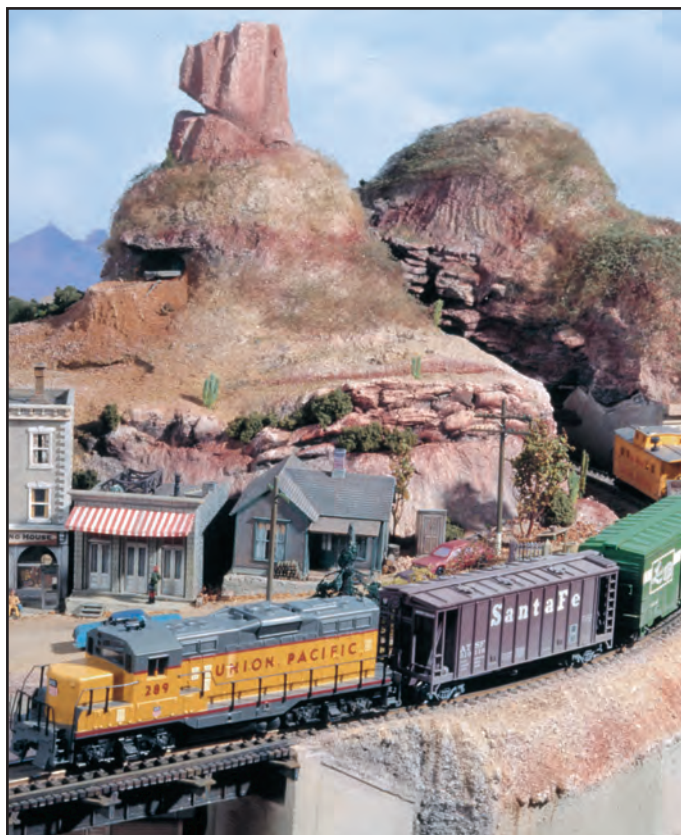
I built a cardboard frame and hot-glued to it several large castings that looked similar to rock faces I'd seen around the marble quarry. The foam strips were glued on top to start the shape of the quarry.

Then I worked from the bottom up, building each quarry level on top of the one below. Thin, flat pieces of Styrofoam formed the "floors" that the next level would rest on. The areas between the rock castings and the quarry walls were filled with plaster cloth. After the plaster cloth dried, Sculptamold was brushed in to blend the rocks and the walls together.

To give the quarry strength, I filled the hollow interior with Great Stuff spray foam. I was careful to apply only a little; squirting in too much would have blown the quarry walls apart.



These magnificent rocks were carved from Styrofoam by Sam Posey for his Midland Central layout. They were painted with acrylic colors to match the scenery in Colorado.



The author built the elaborate desert rock formations in his Cactus Valley layout by bundling together scraps of Great Stuff expanding foam with masking tape, covering the forms with more foam, and carving the formation to its final shape.

After the first application of Great Stuff sets, I added a little more. When it set, I trimmed away the excess that squirted out between the strips. Then I capped the quarry with another piece of Styrofoam.

I brushed the Styrofoam with acrylic gesso to seal the surface. Gesso, which is used to prime art canvas, is a thick white paste sold in art and craft stores. After the gesso dried, I stained the surface with a wash of 8 ounces of wet water mixed with a 1/2" blob of tube acrylic raw umber paint. I brushed on this mixture, letting it flow into cracks and crevices to tone down the bright white of the gesso. Here and there, I streaked on another wash made from of a 1/4" blob of raw sienna an 8 ounces of wet water.

I also made dozens of large blocks of quarried marble from Styrofoam. These were also coated with gesso. Using reference photos as a guide, I colored the rocks by staining them with the raw umber wash. Next, I brushed on a light coat of thinned basic earth color. I wanted a light-colored rock that was a little darker than the marble.

Vehicles, ladders, outbuildings, workers, and several A frames completed the quarry scene.

Monuments and hoodoos

When I built my Cactus Valley project layout for *Model Railroader* magazine (December 1998 and January 1999 issues), I needed a way to make the unusually shaped desert rock formations like those found in Monument Valley in Arizona and Utah (sometimes called "hoodoos").

As a happy accident, I noticed that cans of Great Stuff would sometimes leak after the seal was punctured. The leaking foam squirted out in weird shapes and sizes. After it hardened, I took a handful of these shapes, bunched them together, and wrapped them with masking tape into a bundle that looked something like the rock formations I needed.

I squirted a pile of Great Stuff on top of a mountain and stuck the bundled monument into it. This looked so good that I made several others. After the puddle of foam hardened, I removed

the masking tape and squirted more foam between the individual pieces of the bundle to hold them together.

When everything hardened, I trimmed the sides, flattened the tops, and roughed up the foam using an up-and-down motion with a wire brush. I brushed a light coat of diluted drywall compound over each formation to seal the foam and fill cracks and crevices.

Next came two "signature" rock formations. One was the Indian head monument at Indian Rocks. It was made by standing a scrap of trimmed, hardened foam upright in a swirl of fresh foam. When it set, I trimmed the base and carved the Indian head with a sharp knife.

The second formation was called Flying Rock, a balancing rock on top of a pinnacle. The base, a rectangular piece of foam, was carved to shape and set in a pool of foam. The balancing rock was a piece of scrap impaled on a toothpick on the top of the base. These were colored using the methods described for polyurethane rocks, adding a lot of orange and red.



Finishing: texture

This chapter tells you how to lift your model railroad scenery from ordinary to extraordinary with grass, stone, and weed texture—and lots of it! We can't model individual leaves and blades of grass, but we can give the illusion of lush green lawns, high desert sagebrush, talus piles, dense forest undergrowth, and even wet seaweed clinging to rocks at low tide.

You'll need a variety of textures. Consult the Scenic Express, Walthers, and Woodland Scenics catalogs for the scenery products they sell. Make a list of appropriate texture items you'll need. A typical list should include at least three shades each of fine and coarse green foam, a leaf-colored brown foam, a light tan foam, a yellow-green foam, and several colors of ballast, gravel, coal, and dirt. Don't forget pieces of painted wood, sticks, and tree stumps. By choosing a variety of commercially available materials, you'll be able to create colors and blends that you can duplicate later on when you need more.

You're going to need a lot of texture to make your scenery come alive, even if you're modeling prairie flatlands. Here, the scenic base is decomposed granite gathered from the side of a road. Over this is scenic foam in several different colors and textures, followed by a layer of thin-stretched Poly Fiber to represent low, scrubby weeds. Dick Rotto layout



Different textures and colors of scenic foam were applied at right angles to the track to break up the space and help make both sides of this long, curved segment of track more interesting. Carl Chancey layout



The texture creating visual variety in the space between these tracks is Woodland Scenics Clump Foliage sprinkled over green grass and held in place with bonding spray. Carl Chancey layout

A host of smaller companies offer specialized scenery products. You can find their advertising in *Model Railroader* and other modeling magazines. Many textures can also be made at home, including finely chopped autumn leaves, dyed sawdust

(Chapter 3), shredded fiber filter material, wood scraps from kit building projects, and a variety of sifted stones and dirt. Store all your textures in separate labeled containers where they'll be handy whenever you need them.

Texture layers

A layer of texture is typically applied by brushing on a thick coat of earth paint or diluted glue over the scenic base, then sprinkling fine grass or dirt onto the wet surface. After the paint or glue dries, you'll have the first layer of texture. If a thin ground cover is all you want, stop there. But if you want a heavily textured look, where the surface appears loose and natural, add more texture.

My five-step procedure simplifies the process. You can start and finish in one operation, and so complete a large area in an evening. Remember to cover the track with blue painter's tape before you begin.

The first textures I apply are dirt and grass. Next, I sprinkle on green or yellow grass and more fine dirt. I add piles of cinders or gravel, then coarse grass or clumps of small shrubs, depending on the area.

Texture can be applied using a kitchen sifter, pickle jars with holes poked in the lids, or empty spice bottles. Spreading textures with your fingers works great too, although it can take practice to apply the texture evenly.

Work in one area at a time. Make sure the diluted glue or earth paint is still wet when the first texture is applied over it. Not all textures will adhere to the glue evenly. To absorb puddles of glue, add more texture.

Hold all the texture in place with wet water spray. The trick is to mist on water just until the texture is soaked and settles down. The wet water will allow the matte medium to soak into all the texture layers without leaving bubbles or dry spots.

It's important to spray on enough diluted matte medium to thoroughly soak the texture. Don't be concerned if it runs into unwanted areas. Extra matte medium can be absorbed by a folded paper towel or by simply applying more texture.

If you're building a meadow, use several shades of coarse textured scenic foam, twigs, and small stones. If you want to add texture to an industrial area, behind a factory, or between the rails, sprinkle fine gravel and a few pinches of brown foam for dead leaves. New England stone walls can be added by making rows of small stones and soaking them with the bonding spray.



Plenty of grass texture was needed to complete these big curves. Bob Hayden is adding a thick layer of green foam and soaking it with wet water and matte medium bonding spray to anchor it. Joe Galdi layout

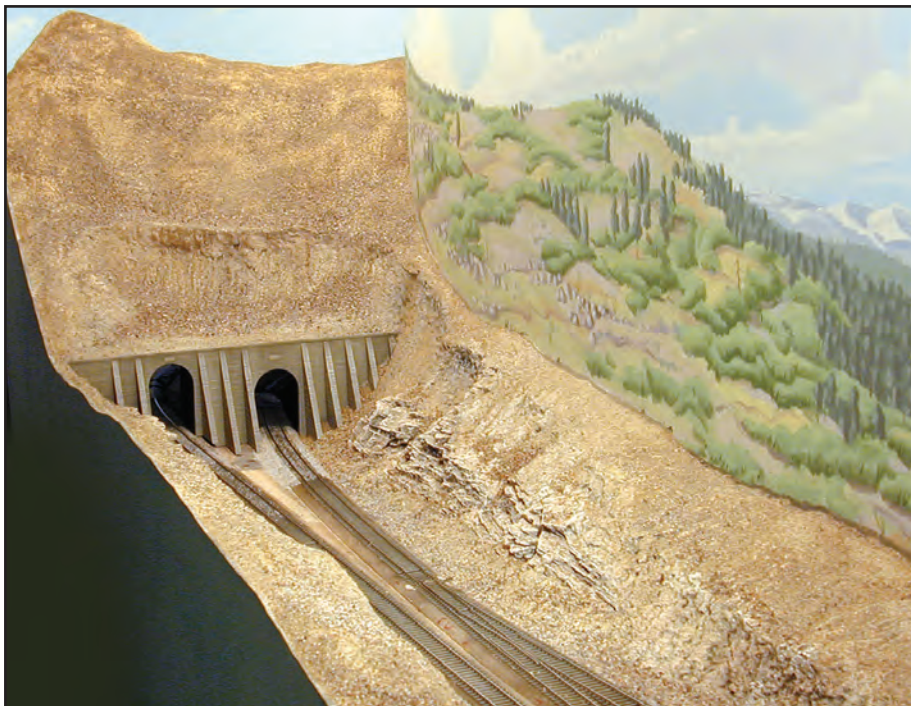
For rocky desert scenery, I mix vermiculite with sifted dirt, decomposed granite, and fine earth scenic foam. A small amount of fine green can also be added to the mix. This mixture is then applied to the wet glue or paint as a base coat. Sprinkle larger stones and gravel over top, and hold them in place with bonding spray.

The more layers you apply, the more detailed (and realistic) the desert or forest scene will look. I like the texture to be thick in fields and meadows and thin around the tracks. Use a large, soft brush to push the texture and ground cover around until they sit exactly where you want them.

Additional dirt and grass may be needed around structures. Small patches of grass or weeds, a pile of gravel, and leaves around foundations all look good. I sprinkle texture around the structures with my fingers and then push it into place with a brush. Keep brushing and pushing until it looks perfect. This is one place where I take my time to get all the texture just right.



As with other elements of scenery building, work from the rear of the layout toward the front when adding texture. The first application of texture—here it's green grass and shrubs—establishes the color and texture scheme for the rest of the railroad. Dave Willis layout



The first layer of texture on this scene is builder's sand mixed with vermiculite and Woodland Scenics Earth. It's a good base for adding more texture since subsequent layers of scenic foam will stay where you sprinkle them until they're bonded in place. Dick Rotto layout



The first texture and subsequent layers on this layout were several green foams blended to replicate the colors of foliage in the Pacific Northwest. Steve McKeon layout

With the texture in place, drip on wet water using an eyedropper and then add several drops of matte medium. Add enough matte medium until all the texture has absorbed it. Again, small puddles of excess matte medium can be covered with more texture or sopped up with the corner of a paper towel.

Details, such as tree limbs and branches, bushes, small stones, and other junk, can be arranged on top of the grass and dirt, then glued as described above. Heavy details need a drop of full-strength white glue on the bottom to hold them. Allow everything to dry overnight.

When the texture is thoroughly dry, remove any loose material by passing the nozzle of a vacuum cleaner close to—but not on—the layout surface. There probably won't be much to remove. As an alternative to vacuuming, apply another spray of diluted medium to further weld the texture in place.

Modeling undergrowth

One of the most effective materials for modeling heavy undergrowth is Woodland Scenics Poly Fiber. Use it to create the illusion of dense growth and to add a little height to flat areas.

Poly Fiber is green, cottony material similar to acrylic pillow stuffing or cotton balls. It has a soft, hair-like quality and can be pulled and stretched into wispy sheets of green filaments.

To make undergrowth I stretch the fiber as thin as possible without tearing it. Tear off a piece of the stretched fiber about the size of your palm. Place the fiber on the scenery and mist with matte medium bonding spray or hair spray. Sprinkle on fine scenic foam, Woodland Scenics Flowers, Noch Leaf Flake Flock, or Static Grass, and spray again to seal the texture in place.

Poly Fiber foliage mats

On a large layout or in areas where a lot of lush textured ground cover is necessary, use foliage mats. These can be made up ahead of time and stored until needed.

To make them, spread a sheet of newspaper on a flat surface (to collect the excess foam which you can save and reuse). Working over the newspaper, stretch out a bag or two of Poly Fiber into large, thin pieces. When you have enough Poly Fiber to cover the newspaper, press the edges of the pieces together to form one large, flat sheet.

Spray the entire surface of the Poly Fiber with matte medium spray, and sprinkle on a variety of colors and textures of scenic foams. Spray more bonding spray over the texture and allow it to dry.

To use the foliage mats, cut off pieces with scissors and press them into the scenic base. Wet with bonding spray to hold them in place. More foam, twigs, and even stones can be added. For extra touches of color, flowers can be

“planted” by sprinkling bright red, yellow, or purple foam over the netting. Re-spray the mat with bonding spray or hair spray, and allow to it dry.

Foliage mats are a great way to texture large areas and get them looking finished in a hurry. When I was building a G scale layout and needed a way to cover a lot of benchwork that was slightly above eye level, I laid foliage mats over the dark-colored wood and planted some trees using hot glue. You could never tell that there was no scenic base. The area looked completely finished!

Foliage mats can be pulled apart and draped over rocks, bridge abutments, or any place where you want lush hanging vines or ivy. Spread a bead of full-strength white glue on the top edge of a rock, push the mat into the glue, hold it with your finger, and pull the fiber downward. Pull until the fiber becomes sheer and separates.

When done right, you get a “hanging gardens of Babylon” effect. This is useful for depicting a down-and-out railroad operation where there’s been little or no maintenance for decades. More texture can be added to the hanging vines after the white glue dries. Just hit it with hair spray, sprinkle on the texture, and seal it in place with another squirt of hair spray.

Lichen

Lichen was once the number one foliage material used on model railroads. Better products have replaced it, but many modelers still use it for ground cover, low shrubs, and trees. Undergrowth and twig-like textures can be modeled by shredding the poor-quality lichen found at the bottom of the bag.

Lichen is a preserved, dyed natural growth available in most hobby shops. (You can also collect and preserve it yourself—see page 40.) It comes in bright green, gray-green, red, and yellow. On most home layouts, lichen will last about 10 years before it becomes hard and brittle from drying.

As lichen comes from the package, only about one third of it is worth using. The usable portion is the top or tip of the lichen. As you get closer to the ground (the bottom of the plant), the lichen becomes coarse and is usually full of dirt and pine needles.



Deep texture is easily modeled with Woodland Scenics Poly Fiber. It can be stretched into a thin mesh, laid over the scenery, and soaked with bonding spray or hair spray to hold it down. The flowers here, made from yellow scenic foam, are sprinkled onto the wet spray.



Here's a piece of Poly Fiber that's been pulled and stretched into a thin sheet. After the sheet was laid on newspaper and soaked with hair spray, a green foam blend was sprinkled on the surface while the spray was wet.



Use hair spray to hold fine texture over coarser texture. For scenery building purposes, one brand serves as well as another. All you need is an inexpensive, super sticky, odorless type.



Here's the ultimate in heavy texture. Two layers of green foam were spread over the scenic shell, followed by a heavy layer of Woodland Scenics Poly Fiber netting, which was covered with two more layers of green texture blend. The area was finished with a light sprinkling of brown and yellow foam. Joe Galdi layout



Sticks taken from the garden replicate a heavily logged forest. The stumps are short twigs glued into holes punched in the scenery. Lichen was used abundantly as the tree and shrub texture. Dave Willis layout



To duplicate the landscape in arid regions of the U.S., you don't need the depth of texture you need for wetter parts of the country. Here's a mixture of Woodland Scenics Earth and Clump Foliage, Silflor, and green foam all glued to a textured Sculptamold base in front of a painted backdrop. Dick Rotto layout

To use lichen, select a piece with a finely textured top structure. Using scissors, snip away the bottom area. It's easy to tell where to cut because the lichen changes color in about the middle. Dip the top portion in white glue, set it on the scenery, and you will have an instant shrub. If it falls over, use a long finishing nail to hold it until the glue dries.

To use the coarse lichen from the bottom of the bag, dip each piece in diluted matte medium and roll it in scenic foam. After the adhesive dries, the textured lichen can be glued in place as described above. This foam-on-lichen texture makes interesting shrubs and background trees.

For undergrowth, chop lichen into small pieces and use these as one of the textures in the process discussed above in "Texture Layers" (pages 60-62).



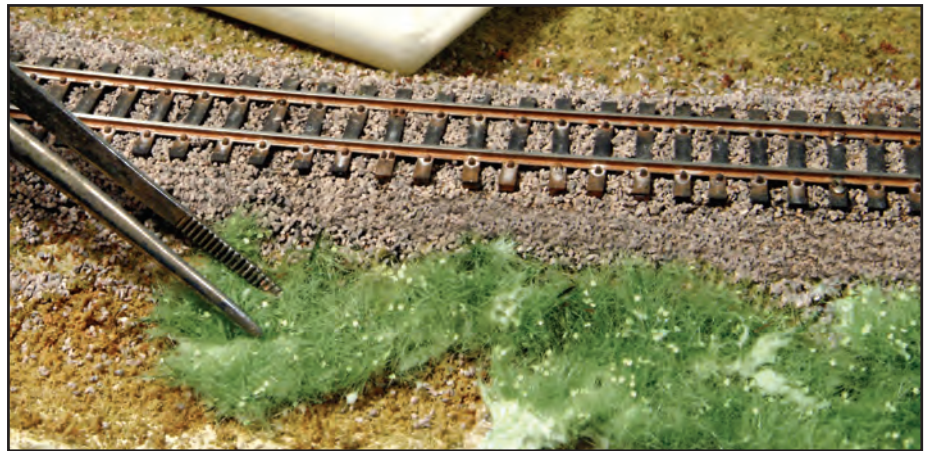
Many different heavy texture materials are available, including these three forms of Silflor.



Tear off a small clump of Silflor, dip it in diluted white glue, and plant it in on the scenery. By positioning several small clumps together, you get a more realistic effect than trying to place one large clump.



Here's the backside of a piece of Silflor. The backing contains shiny filaments. Remove them by scribing the backing with a hobby knife and pulling the filaments out with tweezers.



Small clusters of Silflor are being placed along this right-of-way. After the glue dries, more green foam will be sprinkled around the Silflor.

Silflor

Silflor is a grass mat material sold in sheets in various colors, textures, and surfaces. It's available from Scenic Express, but other scenery suppliers offer slightly different products that produce similar results. It's used to model manicured lawns, tall grass, and weeds.

The Silflor sheets are made like rugs. A synthetic grass material is attached to a fiber backing. The backing material has different weaves, depending upon the length and texture of the grass it's supporting. To use Silflor, select a color and texture, pinch off a piece using tweezers, dip it in white glue, and set it in place on the scenery. Silflor looks best when applied in bunches of different heights and colors.



Here's the finished grass patch. The tops of the Silflor can be colored to represent dying grass by dry-brushing them with raw sienna.



An assortment of colored and textured scenic foams, Silflor, and twigs cut from the author's backyard were blended with several handmade trees to complete this scene. Alan Rieper layout



This instant swamp, with barrels sunk in a pool of EnviroTex (see Chapter 7) was finished by gluing twigs and sticks around the edge of the swamp. Carl Chancey layout

I've used a lot of Silflor on commercial displays and have found the tall tan grass makes wonderful dried desert growth. Squares cut from the short green grass make good-looking manicured lawns, golf fairways, and parks.

Silflor hedges can be made by cutting thin strips of tall green grass and gluing them around the edges of the grass plots. I use T-shaped pushpins to hold Silflor clumps to sloping areas.

Silflor is versatile, but large expanses of green grass can be boring. To add visual interest, try dry-brushing the top of the Silflor with your basic earth color or an even lighter mustard color made by mixing earth with a little medium yellow.

The only annoying feature of Silflor is the presence of shiny fibers in the backing material. These filaments protrude from the edges of a weed patch like a cowlick and have to be removed.

Before using a sheet of Silflor, I cross-cut the fiber backing with a hobby knife (do not cut through the backing) and pull the fibers out. With these long shiny treads missing, the Silflor still holds together, but can now be separated into very small pieces.

Scenic foam putty

It's hard to make clusters of vegetation stick to vertical surfaces as well as up, under, and around rock castings, stone walls, and bridge abutments. You may have tried putting scenic foam on a card and blowing it into wet glue. What happened? The foam usually spread all over the existing scenery with little of it sticking to the glue and, if you took a deep breath, some of it may have gone up your nose!

My answer to this problem is foam putty. Mix a tuna can full of scenic foam, (any color mixture or texture will work) with enough diluted matte medium bonding solution to make a thick paste. I like it wet enough that I can just squeeze out a little liquid—about the consistency of oatmeal.

Pick up a pinch of foam putty with your fingers and gently push it into a crevice in a rock casting. Don't push too hard or you'll flatten and compact it. You'll want it to look rough and textured, like a low-growing hedge or clump of weeds.

Leave the putty as loose and ragged-looking as possible; if you push it flat, add texture by flicking at the surface with the tip of a spatula or hobby knife. When the foam putty is wet, it will look milky, but it will dry to the color of the scenic texture it's made from. It'll look okay once it has dried overnight.

Once you get the hang of this process, you can use a spatula to place the foam putty around rock castings, on buildings, or anywhere that needs creeping vines or large, sprawling clumps of weeds or undergrowth.

To make putty with more sticking power, mix 1 part diluted white glue to 1 part foam. I use this blend under overhanging surfaces or places where I need a lot of vegetation to cover a gap or hole.

You can also mix coarse foam putty by combining coarse scenic foam with thinned liquid latex molding compound



This tar road was made from .040" sheet styrene glued in place with hot glue and painted with basic scenery black. The author sprinkled finely sifted baseball diamond dirt into the wet paint, and then applied a second coat of basic scenery black to seal the surface.

(the stuff used to make rock molds—1 part latex to 3 parts water). Add enough liquid rubber to the foam to make a dough. Spread the dough on a sheet of waxed paper or on a window screen over a sheet of newspaper, and allow it to dry. This may take several days.

The result is similar to Woodland Scenics Foliage Clusters. Just tear the dried foam putty clusters apart and place it on the scenery. The advantage of making your own clusters is that you get to use your texture blends and choose the texture and colors to fit your layout.

Scenery details

Piles of clutter here and there will trick viewers into thinking that your model scene has lots of detail even where it doesn't. Small details like painted and weathered pipes, twigs, tree branches, ties, piles of cinders, barrels, boxes, leftover scraps from kit building projects, and junk automobiles make great detail. Consider it just another type of texture!

A typical detail pile includes several rocks, a few weeds, a board, and an old

tire. Another might have a pile of old weathered boards and a few cement blocks. Glue large parts in place with diluted white glue, then set the smaller items around them. Soak everything with matte medium when you're satisfied with the arrangement.

Piles of detail and clutter break up expanses of scenery into smaller, more-defined scenes. These small, detailed areas help make the railroad look larger than it is. Clutter can also be used to lead the viewer's eye into a scene and toward or away from certain features. The important thing to remember is that the detail clusters should be small groups of different things.

Modeling bare ground

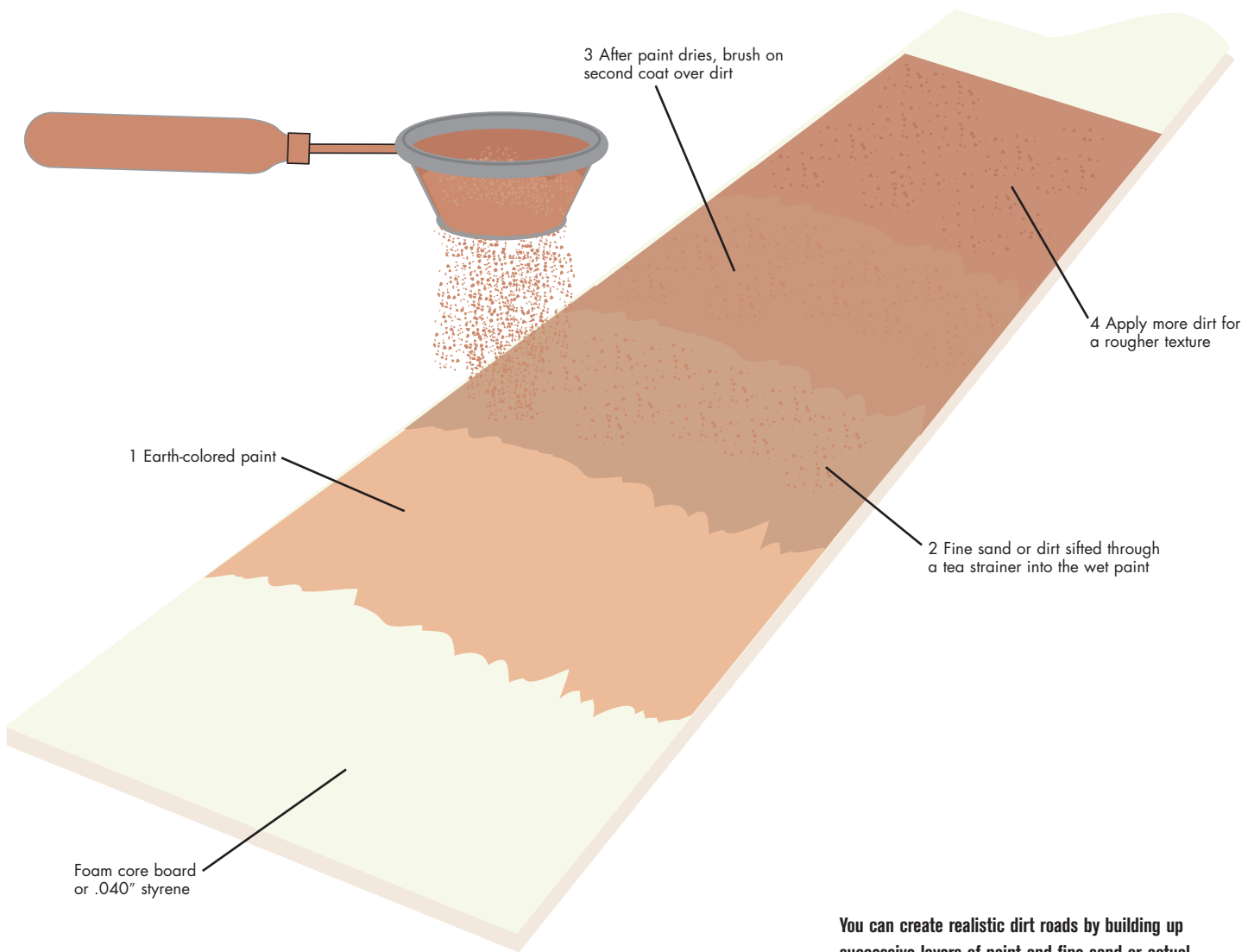
Although bare ground is the opposite of texture over texture, effectively modeling it calls for the same attention to detail. If handled poorly, bare ground seems to jump out of the layout and beg for a sprinkle of grass to hide it.

Bare ground should blend naturally into the surrounding scenery. It is usually man-made: a cleared area for a road, dirt parking area, a plowed field, or a vacant lot. The basic approach is the same for modeling all of these; I'll describe it in the next section, using a dirt road as an example.

Dirt roads

The first step is to contour the area. This may mean just marking the outline of the road in pencil on a flat table or roughly shaping the road with a layer of Sculptamold to get texture and gentle undulations.

You may have to build a flat surface for the road. I've used corrugated cardboard and sheet styrene as the base. Glue the ends in place, and allow the road surface to generally follow the scenic terrain. Fill the sides or shoulders of the road with Sculptamold so it will hold its shape. If you're adding the road over existing scenery, blend the



You can create realistic dirt roads by building up successive layers of paint and fine sand or actual dirt sifted through a strainer.

Sculptamold into the surroundings so that it looks natural.

After the road is shaped, give it a coat of full-strength earth-colored paint. While the paint is wet, sprinkle a layer of baseball diamond dirt over the painted surface using a tea strainer. The trick is to apply the dirt evenly, so that the area is smooth and all the paint is absorbed.

Once the paint dries, vacuum the surface and add another coat of paint and more dirt. In this second layer of dirt, add wheel ruts, and tire marks by rolling a model car over the surface. Dig puddles and potholes using the tip of a hobby knife. Again, allow the paint to dry.

When you like the way the road surface looks, coat everything with a third coat of 1 part earth paint diluted with 2 parts water. After this dries, dry-brush the ruts and road surface with white, add grease and dark spots with a

drizzle of black wash, and finish between the ruts with fine green grass or flocking.

Bond the grass in place by spraying the whole flat surface with wet water and then drizzle on matte medium using an eyedropper. It's important to spray the entire area with water so the matte medium will spread out and not leave a noticeable mark where it was applied.

Tar roads

For a hot top or tar road, build a dirt road, but paint it with basic scenery black. (For old roads, add even more earth color to the black to make it lighter.) Sprinkle the dirt into the paint in one fine layer, and allow it to dry undisturbed. Paint on a second coat of the black to seal the textured surface.

Weather tar road surfaces by making a lighter shade of basic scenery black mixed with a little white and Raw

Umber. To make tar seams and patches, use a fine-tipped black marking pen. The last step is to dust the road with earth-colored powdered pastel chalk down the middle and along the edges.

Paved roads

One technique for modeling paved roads is to pour a soupy Sculptamold mixture into a frame made by hot-gluing $\frac{1}{4}$ " wood strips along the edge of the road. This makes a form to hold the sides of the Sculptamold.

The Sculptamold is troweled in, and the top surface is smoothed with a stick or metal straightedge. The wood forms will guide the straightedge to make a smooth surface. Add cracks and patches, scribe expansion joints, and scoop potholes into the surface as the Sculptamold dries. Paint and texture as described above.



There's nothing like large trees to put trains in perspective on a layout and give a sense of scale. These trees were made using sagebrush for the trunks and Scenic Express SuperTrees for the foliage.

Trees and foliage

As you learned in the previous chapter, just as “clothes make the man,” texture makes the scenery on a model railroad. The more texture your layout has, the better it looks. That’s especially true of trees and other tall foliage: The greater the variety of colors, shapes, and textures, the more realistic your scenery will look. Trees and tall foliage also add another, different dimension to your layout by concealing some parts of the scenery.

Trees are the most conspicuous “growing” things in our scenery. The most important thing to remember is that you need a lot of them, even for a small layout or module. Because of this, if you want your railroad to have a forested look, you’ll have to abandon the idea of building trees as individual models.



The mountain on this O gauge layout is covered with a variety of trees. The juxtaposition of many different types of trees in the same scene makes the scenery look more interesting. Carl Chancey layout



These custom-made pine trees from Sterling Models are so beautiful they should be placed only in the immediate foreground. Dick Rotto layout

trees. Check the Scenic Express, Sterling Models, Walthers, and Woodland Scenics catalogs to see what's available.

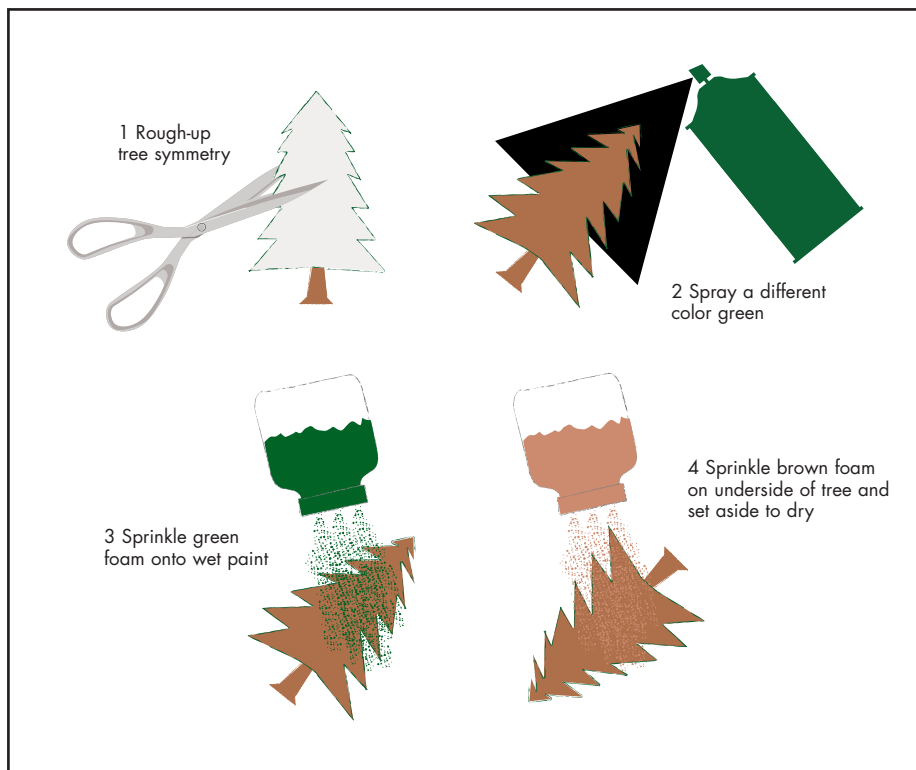
With the proper preparation, almost any brand or type of manufactured tree will work on your layout. For the simplest installations, remove the trees from their packages, snip the plastic stands from the bottoms of the trunks, punch holes in the layout surface, and "plant" the trees. A group of two or three trees always looks better than a single tree. You can improve a commercial tree by painting the trunk to get rid of the plastic shine and adding a sprinkling of yellow-green foliage to the top after the tree is glued in place on the layout.

Most commercial pine trees, even the shiny cast-plastic ones, can be vastly improved by spraying them with diluted matte medium and sprinkling on a little blue-green scenic foam, sawdust, or flock.

Trees from natural materials

Deciduous trees are easy to make from weeds found in your backyard, by the sides of country roads, or the local park or forest preserve. Modelers have been getting good results with these materials for years.

Look for twigs that are tree-shaped and sturdy enough to withstand handling while being picked, packed, colored, and having foliage applied. I can't tell you specific varieties to look for because they vary depending on where you live. Where I live in New England, several woody varieties are best picked in the winter.



You can get many of the benefits of building trees from scratch with less of the work by improving commercial trees with a simple "makeover."

Commercial trees

The quickest way to add lots of trees to your scenery is to use "ready-to-run" trees right out of the box. An amazing variety is available from more than a dozen or so manufacturers. Buy the

more expensive and detailed trees to use in the foreground of your layout, and get less expensive bottlebrush, or "fuzzy lollipop," trees for the background. Planted in clusters, the detailed trees can be made to rival the best handmade



This pretty little tree started out as a weed from the author's backyard. He left the seed pods on for added texture before spraying the tree with glue and sprinkling on light-green scenic foam.



The basic process for making a weed tree like these is simple: Select and dry the weed, dip it in bonding spray then into a bag of scenic foam, and place the tree in a block of Styrofoam to dry.



Once you get the hang of the weed-tree process, you can make "a tree a minute." These weeds were dipped in the matte medium bonding solution and then dipped in a bag of scenic foam.



Most of the trees in Ric Keller's spectacular N scale Boston & Maine New Hampshire Division were made using weeds gathered from his backyard.



A trip to the woods, park, or just your backyard may turn up a source for weed trees. Here's a large twig cut from a sumac plant in southern California. Dipping it in matte medium bonding solution and then a bag of scenic foam will yield a great tree.



Both large and small trees can be made from dried pepper grass, another item you can find in the dried flower section of craft stores.

When you get the twigs home, trim them into tree shapes with scissors. Save the clippings to make small shrubs and bushes. Some twigs will have seed pods attached. These weeds are usually tree-shaped, and they will look good just covered with foam. If the seed pods are loose or crumbly, remove them. Leave the stems long for easy handling.

After you shape the trees, you may want to color the trunks. Some twigs look good as-is; after all, they are essentially made of wood. Separate out the ones that need coloring and paint them with spray cans. Dark gray automotive primer, dark brown, earth, reddish brown, and white (for birch



Sweet basil is a dried herb you can find in craft stores. The author has bound the base of this clump with brown thread and coated it with a drop of white glue to hold it together and create a small tree.



This is a Scenic Express SuperTree, made from a type of dwarf tree that grows in the Arctic tundra of Scandinavia.

trees) are all good colors.

Spread the twigs on a sheet of newspaper, and spray the whole bunch either outdoors or in an indoor spray booth (don't forget to wear your respirator). Turn them and spray the other side. Don't be afraid to use two or more colors to simulate different tones and shades on the bark of a single tree.

You can also color twigs with acrylic paints. Fill a coffee can (or similar-sized large container) with earth-colored scenery paint and add several drops of raw umber or raw sienna tint or squeeze out about an inch of raw umber from a tube. Mix well; add more color as necessary to create a nice dark earth

color. Dip the trunks in the paint and spread them out on newspaper to dry.

For modeling trees with white bark like birch and aspens, I color the trunks with a light gray mixture of 1 cup of flat white latex paint and 1 cup of water. Add approximately 1" of black tube paint and a few drops of liquid dish detergent. Simulate dark scars across the bark with a black fine-point marking pen.

Apply our basic black wash (see Chapter 3) to the foreground trees to emphasize the texture of the bark. After it dries, dry-brush the trunks with white.

Now it's time to add foliage. Dip each twig in a mixture of 3 parts water to 1 part white glue. Drain off excess glue and plunge the twig into a bag of scenic foam blend. Gently tap the twig tree over the bag to shake off excess foam, then stand each twig tree in a block of Styrofoam until the glue dries, which usually takes overnight. Also, build trees over several sheets of newspaper so you can recover scenic foam for reuse.

Plant twig trees on the layout in clumps of three or more. Clip the base of each trunk with wire cutters to make a crude point. Punch a hole in the scenery with an awl, dip the trunk in full-strength white glue, and push the trunk into the hole.

The first tree should stand straight up. If it wants to lean, prop it up straight until the glue sets; blocks of wood, metal weights, even paint bottles come in handy. You may see crooked trees in nature, but a crooked tree on a model railroad looks awful.

After the first tree is solidly in place, plant a second and then a third. Use the first tree to hold the others upright, and plant them so the foliage will overlap and intermingle to make a tight-knit cluster.

To add more variety to the treetops, spray the upper branches of the planted trees with matte medium bonding spray (see Chapter 3) and sprinkle on fine foam several shades lighter than the tree color. Just a pinch or two is all it takes. The effect is similar to dry-brushing rock castings.

You might also try planting mixed groups of homemade and commercial trees together. Make sure there are many different types in each group to add variety.

Add lichen for fullness

To make fuller-looking twig trees, cover the twig branch structure with scrap lichen (see “Coloring and Preserving Lichen” on page 40). Lichen is heavy when it’s soaked with glue, so large trees may be top heavy.

Glue pieces of lichen to the twig branches with white glue. Large clumps can be cut in half and glued on both sides of the branches. Add more lichen, but allow the glue to dry on each layer of lichen before adding more. When you are satisfied with the shape and all the glue has dried, mist the lichen with matte medium bonding spray and shake off excess liquid.

Holding the twig by its trunk, turn the tree upside down and sprinkle on green scenic foam. Flip the tree upright, and sprinkle on a lighter shade of green to reinforce the illusion of light and shadow. Finish by sprinkling a few flecks of yellow foam on the tops of the trees to represent sun-drenched leaves.

If a group of trees does not look full enough, try gluing a piece of scrap lichen covered with foam or a Poly Fiber ball on top of the cluster to flesh it out.

Trees from dried flowers

An alternative to gathering materials from your backyard is a visit to the dried flower section of a hobby, craft, or florist shop. Dried flowers are available in dozens of colors. I’ve found a number of varieties useful in my railroad forestation projects, including pepper grass (known as baby bush, candy bush, and beige lace), hard hacket (hard cap and wild oregano), gypsophila (baby’s breath), sweet basil, wild spirea (meadowsweet), and candy tufts.

Dried flowers don’t look like much by themselves, but when clustered into a bouquet, they make nice trees. Bunch a half-dozen stems together and wrap them with tape to make a tree form.

Paint the trunks brownish-gray and spray the tops with medium green or brown. Dip the tops in diluted white glue and then in foam to make a quick tree. For a fuller-looking tree, cover the branches with Poly Fiber, spray with diluted matte medium, and sprinkle with several colors of foam foliage.

Pepper grass comes in many colors and makes convincing small trees with



When you buy a bag of sagebrush or pick your own, you’ll find that not all the pieces will be perfect little trees. Most will require trimming to get a good tree shape.



This small sagebrush tree is on George Sellios’ HO scale Franklin & South Manchester layout. Coarse foam was effectively used for the foliage.

little work. You can make a birch or aspen tree almost as quickly as you can read this paragraph. Choose a medium-green pepper grass and cut it into short branches that have a tuft of leaves at the top. Paint the trunks white, add a black stripe or two, and you have an instant tree. Yellow pepper grass makes good-looking aspens—just paint the trunks light gray.

SuperTrees

Sold by Scenic Express, SuperTrees arrived in the modeling world several years ago and added another dimension of realism to scenery making. They are natural indigenous trees that grow in the Arctic tundra of Scandinavia. These dwarf trees have a wispy, fine branch



Sagebrush makes a great base for any type of scenic tree. Here’s an exceptionally gnarly piece that looks better bare than covered with foliage.

structure that makes them excellent scale stand-ins for trees. Out of the bag SuperTrees are fragile, but with the right treatment they can be made more durable.

Scenic Express provides instructions for soaking SuperTrees in diluted matte medium and hanging them upside down, like clothes on a line, to dry. Dipping and hanging strengthens and straightens the trees and gets them ready for foliage. The instructions suggest putting a snap-type clothespin on the top of the tree (which is on the bottom if you’re hanging them upside down) to add weight and help straighten the miniature trunk.

To add foliage to SuperTrees, spray them with matte medium and sprinkle



A piece of sagebrush like this one, with good bark texture and fine upper branches, is just the ticket for making a foreground tree.



When attaching SuperTree branches to a sage trunk, lay the trunk on its side and use gravity to keep the branch in place until the glue dries.

on foam. I've also tried dipping the trees in a bucket of matte medium, shaking off the excess, and rolling them in a bag of foam. Both methods work, but the first results in a neater, better-looking finished product.

Sagebrush trees

If you're lucky enough to live in a part of the country where sagebrush grows, you have a steady supply of realistic tree material ready for picking. If you live elsewhere, you can purchase sagebrush branches from several scenery suppliers.

Sagebrush makes wonderful foreground trees (see page 75). The bark has texture that you can see from several feet away, and the branch structure looks like a miniature tree.

To build trees from sagebrush, start with several dozen sagebrush armatures. Using diagonal cutters, trim away branches that look out of place or are too long. Snip away any leaves on the branches with scissors.



To make a sagebrush tree easier to mount on the scenery, drill a hole in the base and insert a small nail. The bigger the tree, the longer the nail!



After the SuperTree foliage is glued in place on the sage trunk, give everything a light spray of brown to blend the foliage together.

Cut the bottom of each trunk square with a razor saw. (Save the trunk trimmings—they make great stumps.) Using a no. 52 bit, drill a hole about $\frac{1}{2}$ " deep in the base of each trunk. Dip a $1\frac{1}{2}$ " wire brad in super glue and insert it into the hole, leaving about 1" protruding.

Cut off the head of the brad with diagonal cutters to form a point, and stand the trunks in a Styrofoam block for painting. Larger and heavier trees will need longer brads to keep them upright.

Sagebrush has a loose bark texture, that I like to seal before handling the tree further. Brush a thin coat of full-strength matte medium on the trunk and up into the branches. Allow the matte medium to dry overnight.

You can add color to the trunks by mixing a little raw umber into the matte medium before applying it to the trunks. Experiment with the amount of paint needed to get the color you want.

Once the trunks are prepared, there are several ways to add foliage to them. The most realistic approach is to make the branch structure out of SuperTrees. Using scissors, snip the top 2" from each SuperTree. Trim some of the individual branches from the bottom part of the stalk. Using tweezers, pluck away the tiny leaves that grow in the SuperTree foliage.

Insert the sagebrush trunk horizontally into the end of a Styrofoam block. The trunk should be almost lying on its side. It's a lot easier to glue branches to one side of the trunk in this position, because gravity will help hold the branch in place while the glue dries.

I use either yellow carpenter's glue or a heavy-duty plastic cement called Zap Goo II (sold in tubes at most hardware stores) to attach the SuperTree branches to the trunk. Whichever glue you choose, squirt a small blob of it onto a piece of scrap paper.

Hold a SuperTree branch with tweezers and dip the end of it into the glue. Place it on one of the sagebrush branches. The SuperTree branch may not want to stay in position, so turn the sage trunk until you find a place where the branch will be self-supporting. Add all the branches that will stay in place while the tree is on its side.

Allow the glue to dry, turn the tree over, and place more branches. Keep doing this until the tree looks full. It's hard to make a perfect tree, so almost any symmetrical arrangement is OK.

Stand the tree upright in the block of Styrofoam and add branches to the top. Larger SuperTree pieces can be glued between the sage branches to create a fuller shape. The blob of glue that holds the branch in place will fill the space where the branch meets the trunk.

Color the new branches to match the trunk color. Brush on burnt sienna, or you can spray brown or gray onto the underside of the branches.

Adding leaves

Working over newspaper, spray matte medium bonding solution onto the tree branches. Sprinkle on green or fall-colored scenic foam. I apply coarse foam first, followed by finer texture. Spray the branches with the bonding spray a second time to wet the "leaves." This

second wetting will help the matte medium penetrate the foliage and hold the tree together.

Be careful when you spray the tops of these trees. The branches can hold a lot of water, and the weight may cause small branches to break off. To avoid this, add leaves a little at a time: Spray part of the branches, sprinkle on some foam, and let the tree dry overnight. When the spray dries, it will strengthen the branch structure so more matte medium and foam can be added.

The last step is to re-wet the tops of the foliage and sprinkle on fine yellow-green scenic foam or Noch Flake Flock (light green). This lighter-colored foliage provides nice texture contrast and gives the trees the look of sunlight falling on them. Set the tree aside and let it dry for several days before placing it on your layout.

Foreground trees

Foreground trees require extra detail. In many cases, twig trees can still be used in the foreground, but the trunks need extra detailing.

To add three-dimensional bark and root texture to twigs, first rough up the lower portion of the trunk with coarse sandpaper. Drill a hole in the trunk and glue in a wire brad, as for the sagebrush trees (described above). Stick each tree into a block of Styrofoam covered with a plastic food wrap or waxed paper.

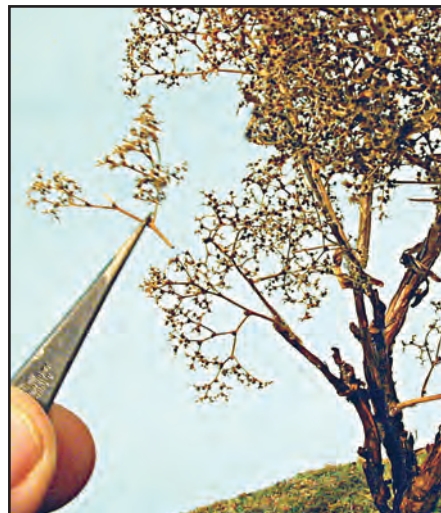
Mix a stiff batch of Durham's Rock Hard Water Putty (lightweight acrylic spackle will also work). The mixture should be a little looser than modeling clay. Mix only enough to make a ball the size of a large marble.

Wrap the putty around the lower portion of the trunk, feathering it into the upper portion so no sharp line is visible. Pull some of the putty down and away from the tree to form roots. Make the roots thick so they won't crack during handling and carving.

Leave the putty alone until it starts to set. At the point that small pieces flake away when scraped with a sharp tool, scribe in bark texture. Use a light touch, and remove excess putty chips with a soft brush. The brush will also smooth out deep bark lines. When the bark texture is complete, allow the putty to dry overnight.



Any type of plant mister or sprayer will work for applying matte medium bonding spray to tree foliage. Here's a sprayer sold by Scenic Express.



After the bulk of the tree is built, glue small branch ends in place to round out the shape.



Noch makes tiny leaves in an assortment of colors. Wet the foliage with bonding spray and shake the leaves on the tree.



Here's the finished sagebrush tree with SuperTree foliage. It stands about 12" tall—perfect for O scale.



The first step in making a cottonwood tree is to cover a sage trunk with Poly Fiber balls. Spray the tree with glue and sprinkle on the leaves.



Nice tree bark can be made simply by wrapping the trunk in crepe paper. Glue the edges to hold the paper in place. Here, it's painted with burnt umber and dry-brushed with white.



Foreground trees have to look good close up. This part of Steve McKeon's layout is built on a shelf, so it's all foreground. The well-made pine clusters look realistic, even though they are close to the front edge.



Noch Leaf Flock has been glued on a small SuperTree to make this realistic tree. Even though the leaves are out of scale on this HO scale layout, the viewer's eye forgives the discrepancy.

Paint the trunk and roots with a bark color of your choice. After the paint dries, apply a light coat of basic black wash, allowing it to run into the cracks and crevices. When the black wash has dried, lightly dry-brush the trunk and roots with a brownish-gray made by adding a little white to the bark color.

Complete the tree by adding foliage material over the branches, using one of the tree-making methods described above. Use fine scenic foam for the leaves, followed by a light sprinkling of yellow. Make sure you add enough foliage material to make the tree look full; a foreground tree should have

plenty of "leaves" on the branches. Foreground trees should also be the tallest on your railroad, so they contribute to the illusion of depth.

Evergreen trees

Evergreen trees are easy to model: Take a strip of $\frac{3}{8}$ "-square balsa wood, round it using sandpaper, taper it, and make bark texture it by running a coarse file up and down the trunk. Stain the trunk bark color before drilling two or three dozen little holes in the trunk for the foliage.

For the branches, use any of several foliage materials, including air fern (the dyed skeletal remains of a saltwater

animal called *Sertularia*), caspia, asparagus fern, and other preserved natural growths from the dried flower section of craft stores.

Spray the branch green and mist it with diluted matte medium before sprinkling on dark blue-green ground foam. Dip the end of the branch in white glue and insert it in the pre-drilled holes in the trunk. Work up the tree, starting with the largest branches at the bottom, and place progressively smaller branches as you go up.

These trees are a lot of work, so I like to use them in the foreground of the layout, where they can be appreciated. Use smaller, mass-produced pine trees in the background.

Kit pine trees

Good foreground pine trees can also be made from kits, which include a metal or wood trunk and a bag of foliage material. Many of these trees are similar in construction to the scratchbuilt evergreen trees described above.

The Scenic Express catalog has more than a dozen styles and sizes of ready-built pines. With a little work, any of these can be used in the foreground. Spray the tips of the branches with matte medium solution and sprinkle on fine dark green and blue-green foam.

You can spruce up (pardon the pun) kit-built pine trees to prevent them from looking drab or uniform by varying the texture and color of the foliage on individual trees. Pine foliage should be a little darker than deciduous trees, tending toward gray, blue-green, and



This pine is built on a tapered dowel with foliage made from green furnace filter material. The filter was separated into thin wafers, which were then cut in circles and impaled on the trunk.

gray-blue. Large pine trees look best when grouped in threes, and don't forget to sprinkle a little fine brown foam under the trees to represent pine needles.

Background trees

Background trees don't need to be as carefully detailed as foreground trees. In fact, they can be any scale as long as they are smaller than those in the foreground. For example, you can use inexpensive trees intended for N scale in the background of an HO layout. The trick is simple: Always place the smaller trees behind the larger ones. You can also mass produce background trees yourself from a variety of materials; we'll discuss some of those techniques in the following sections.

Poly Fiber trees

In areas with large stands of deciduous trees, you see only the trunks of the trees in the foreground. From a distance, as on a hillside, you see only the sides and the tops. Woodland Scenics Poly Fiber "puff-ball" trees make it easy to model such tree-covered backgrounds.

Start by making hundreds of little fiber balls from green Poly Fiber. I wear latex gloves to keep my hands clean and for traction while handling the Poly Fiber. Tear off Poly Fiber pieces about the size of golf balls. Stretch these pieces into a thin spider web and tear them in half again. Pull and stretch the fiber to



An good example of mixing different types of trees, this layout has SuperTrees along the track, and just above them are High Pines Ltd. bottlebrush trees of varying sizes. Joe Galdi layout



This is an example of effective use of a tree cluster comprised of commercially manufactured trees from many different sources. Joe Galdi layout

expand each piece again, and roll these around in your hands to form the ball. Toss each ball into a shallow pan filled with matte medium bonding solution thinned slightly with wet water.

After the pan fills with fiber balls, scoop out a handful and squeeze out excess moisture. Drop the balls into a bag of blended scenic foam, close the top, and shake the bag. Remove the balls, shake off any excess foam, and place them on newspaper to dry. A fan will speed the drying process. One Poly Fiber package yields 50 to 75 balls, depending on how thin you stretch the fiber.

For variety, use a different scenic foam

blend for each new package of Poly Fiber. After the tree balls dry, mix the different tree colors together for variety, and store them in plastic bags until planting time.

Planting these trees goes fast. Start at the bottom of the tree area and work upward. Dip each ball in diluted white glue and set it standing straight up; set the next ball as close to the first as possible. Work in rows, stacking each row of tree balls on the one below until your hillside is covered.

The textured scenic base has enough "tooth" to hold these trees, even on a vertical surface. If a tree ball wants to fall



On big layouts like this one, where it's hard to reach the back, rear sections have to be forested before proceeding with the areas in front. Here, puff-ball trees were added to the hills at the back first.



Puff-ball trees are great for representing heavy foliage in the background. Tom Piccirillo layout

over, hold it in place with a long finishing nail. Remove the nail after the glue sets.

Add small pine trees, clumps of Woodland Scenics Foliage Clusters, and twigs between the balls after the glue has dried. This varies the texture and breaks up any hint of a carpet-like appearance.

Bottlebrush trees

“Bottlebrush” trees are evergreens that start out looking like the kind of brush used to scrub the inside of a bottle. Make them by laying short lengths of jute rope or broom bristles in the middle of a length of wire and folding the wire back on itself to trap the bristles. Twist the wire to lock the bristles in place, twirling them in a circular motion.

After the bottlebrush is formed, trim it to a tree shape, paint it, apply texture, and planted it. These trees allow a modeler to fill a large area with pine trees at little cost.

You can also purchase ready made bottlebrush trees from scenery suppliers, but many commercial trees are the

wrong color or have shiny branches. You can improve them by adding a fine, dark green texture to the branches.

Place the trees in a Styrofoam base so they're standing upright; spray them with diluted matte medium. Sprinkle new scenic foam on each tree so the tops of the branches are evenly coated. If necessary, color the trunks with reddish-brown acrylic paint.

Loofah sponge trees

Loofah sponges are the dried remains of a large cucumber-like vegetable grown in Asia and the southeastern U.S. They're sold in drug, health, and department stores as bath sponges, and they've been used for centuries to scrub away rough skin. Curious about their scenery-making potential, I cut one of these sponges apart and found the interior was perfect for making convincing deadwood and bare branches for small trees or brush.

Loofah sponges differ from most other natural scenery materials because they need no further preservation, will not dry out, and are extremely tough.

As they come from the store, Loofah sponges are usually straw-tan in color. Change the color by dipping them in diluted brown or green wall paint, squeezing out any excess paint, and letting them dry. You can also brush-paint the sponge pieces after they're cut apart.

Impale the center portion of the sponge on a pointed dowel painted tree-trunk color. Stack wafers of the material to form a crude pine tree or bush. Spray with matte medium and sprinkle on forest green scenic foam.

Shred Loofahs with scissors to use as undergrowth or as branch structure for small bushes. Daub the sponge with a cotton swab dipped in white glue and sprinkle on green foam or Noch Flake Flock.

Larger sponge pieces make good-looking driftwood for waterfront layouts. Just tear the sponge apart, paint it gray, and glue it to the rocks. Finish by giving it a wet look with gloss medium.

Loofah sponges also make realistic briar patches. All you have to do is pull and separate the sponge into a thin layer and glue it down.



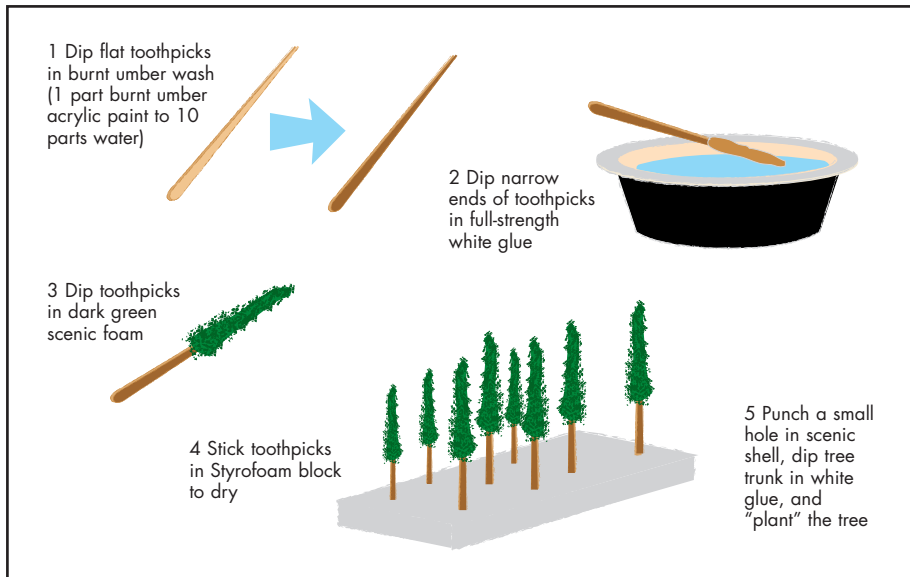
Like other trees, these commercial bottlebrush pine trees look best placed in clusters. Dave Willis layout



Bottlebrush trees get their name from the way they're made. The branches are pieces of sisal rope that have been twisted in a wire trunk. When they're trimmed to shape and painted, they make nice foreground pines. These are commercial bottlebrush trees made by High Pines Ltd.



The background trees in the middle distance here are 2" to 3" high bottlebrush trees. The top of the mountain is covered with 1" high chenille bump trees; even smaller trees are painted on the backdrop. Joe Galdi layout



Toothpick trees may not look like much up close, but they make great background trees for mountain settings.



Believe it or not, these funny looking “bumpy” pipe cleaners can be cut and colored to make good-looking background trees.



All you need to make bump trees are scissors and several lengths of bump chenille.



The author glues a small bump tree to the top of this hill. The blunt tops on the bump trees are created by leaving on a bit of the wire stem when the bump is cut off the pipe-cleaner strip.

Toothpick pine trees

Few things say high mountains more than hundreds of pointed pine trees clustered together. Even few pines sticking up from round-top deciduous forest will give life and definition to your background scenery. Pines provide a vertical element and reinforce the illusion of depth—sometimes where little or no actual depth exists.

The easiest pine trees to build are what I call “toothpick” pines. Here’s how to make them: Buy a box of flat toothpicks and empty the box into about 8 ounces of water to which you’ve added several drops of burnt umber tinting color. After the toothpicks have absorbed the color, put them on a sheet of newspaper to dry.

After the toothpicks are dry, dip each one halfway into a container of diluted white glue and then into forest green scenic foam. Stand each little tree in a Styrofoam block until the glue dries. You can make hundreds of these trees in an evening. Plant them on your layout’s far distant mountaintops.

Chenille bump pine trees

Available from craft stores in many different colors, bumpy chenille (sometimes called “bumps”) looks like a long, colorful pipe cleaner, with sine-wave bulges running the length of the material. For your scenery, use solid green or dark brown bumps because they are the easiest to color. Chenille bump look great interspersed with Poly Fiber trees on a layout.

Cut each strip into six to eight trees 2” to 3” high; you’ll get dozens of trees from a package of bumps. Glue these little trees to poster board with hot glue and spray them with flat dark green spray paint. The color I like best for background trees is the Design Master brand’s Moss Green, but any dark green will work. A solvent-based paint works best because it adheres to the rayon-like fibers of the bumps.

After the paint dries, remove the trees from the poster board and hot-glue them between the Poly Fiber trees in the uppermost parts of the mountains. They will provide a vertical element in an otherwise horizontal scene.



Bump trees are placed on the top of this mountain in front of painted trees. The painted trees add a sense of depth and enhance the illusion that the mountains go on forever.



The author is carving this tree stump from a block of Sculpey clay. When he's satisfied with the shape, he'll pop it in a warm toaster oven until it hardens.



Here's what finished cast tree stumps look like after they're painted and lightly weathered.

Scouring-pad pine trees

You can get away with simple little pine trees made from nylon scouring pads on the tops of mountains that are at least 3 feet from the edge of the layout. I use dark brown pads that are about $\frac{3}{4}$ " thick and porous enough to see through when held up to the light. The thinner green pads from the supermarket will also work.

If you're using the thick pads, start by cutting them in half lengthwise with a thin, serrated knife, scissors, or a single-edged razor blade. When you have a

workable thickness, cut the pads into triangular (tree) shapes connected at the bottom by a thin strip of pad.

Fluff the triangles with your fingers to make them rounder. Dip each pine tree in thinned white glue, let excess glue run off, and sprinkle on fine-textured dark green foam. Shake the tree strip again, and stand each one upright until the glue dries. Glue the strip on the layout in a straight line or in an S pattern to simulate a small stand of pines.



Here's a cast stump painted and installed on the layout. Brown sawdust around the base makes it look like the tree has just been cut down.
Dave Willis layout



This vine was added to the side of the building before the structure was placed on the layout. The base of the vine is a twig white-glued in place, followed by green foam built up over several applications make the foliage.



The top of this Woodland Scenics Field Grass has been dry-brushed with a darker color to add depth by enhancing the texture.



To create these flowers, Woodland Scenics Field Grass was treated with hair spray and topped with red foam.

Tree stumps

Whether or not you think you have artistic talent, you can make beautiful little tree stumps for your logging empire or just for general scenery use. You'll need a lot of stumps—even a small module will soak up several dozen.

The easiest way to get a lot of stumps is to carve several masters, make a mold, and cast as many stumps as you need. The master stumps should not be larger in diameter than the trunk of the largest tree on your layout. I make the masters

from clay-like product called Sculpey, available in craft and hobby stores. It's a white modeling clay material that turns rock-hard when baked.

Cut the Sculpey into 1" squares, then cut these into smaller cubes and place them on a flat, hard surface that will withstand heat. Leave enough space around each cube so you can carve it.

You can make a carving tool by forcing a large sewing needle into the end of a dowel. I use an old dental pick and a hobby knife to carve the stumps.

Roughly shape the clay into a circle, removing the excess and adding it back to form roots.

Run the hobby knife or needle up and down the sides of the stump to form rough, irregular bark. The bark should follow the vertical contours of the stump and extend along the roots. Add a few saw marks to the top of the stump, and model the undercut used to fell the tree. Use the tip of the pick to draw concentric growth rings in the top of the stump and add a ragged edge to the saw cut. When the stump is finished, gently brush the clay with a soft brush to smooth sharp edges. Repeat the process until you've created as many master stumps as you need.

Place the stumps in a 275-degree toaster oven for 5 to 15 minutes, depending upon their size. Be careful not to burn them! Allow the stumps to cool before handling.

Leave the stumps on their flat backing and make a latex rubber mold of them following the directions for making a rock mold in Chapter 4. It's important to make the first coat of rubber very thin to avoid trapping air bubbles. Puncture any bubbles that crop up with a needle.

When the mold is completed, remove it from the master stumps, flip it over, and fill it with plaster or Durham's Rock Hard Water Putty. Durham's Water Putty mixes and sets like plaster, but the color



Spray Woodland Scenics Field Grass with a heavy coat of hair spray. After it dries, the grass can be cut and shaped as a solid unit rather than thousands of individual fly-away strands.



This Field Grass has just been glued at the edge of a pond with white glue. Noch birch leaves serve as the lily pads in the foreground. Alan Rieper layout

is almost that of raw wood, which makes coloring the tops of the stumps quick and easy.

Gently flex the mold to pop out the stumps. Stumps don't require much plaster, so I like to cast them when I'm making rock castings or as part of other scenery chores that require plaster.

I like to paint a large batch of stumps in one sitting. Before painting, sand the bottom of each stump level. Put several lengths of masking tape sticky side up on a square of cardboard, and put the stumps on the tape. This makes it easy to handle the stumps during painting.

The color of the bark on a stump is not the same as a living tree; stumps are grayer, sometimes almost silver. Colors range from light reddish gray, through brown, to dark silver-gray.

Put a pea-sized blob of the following acrylic colors on a piece of scrap plastic: titanium white, mars black, burnt umber, and raw sienna. I have also used a wash of India ink and alcohol tinted with a little cadmium yellow. For tools, you'll need a small cup of wet water, several brushes, and a tissue.

Stumps can be painted when the plaster is still damp; I usually color them right after I've removed them from the mold. Mix equal portions of raw umber and raw sienna, and add enough water to make the paint quite thin. We want just enough water mixed with the paint so the



This heavy grass and weed growth is modeled with Woodland Scenics Poly Fiber stretched into thin sheets and covered with scenic foam, clumps of texture, and colored foam "flowers."

paint flows off the brush and into all the nooks and crannies of the bark texture.

Brush the mixture over the bark of several stumps. If the color looks too dark, add white. Color several more stumps by adding black to the mix. Another good bark color can be made by mixing equal parts of black and white to get a military gray. Add a squirt of raw sienna to the gray to make a warm reddish-gray. Keep varying the colors as you paint additional stumps.

After the bark color dries, paint the raw

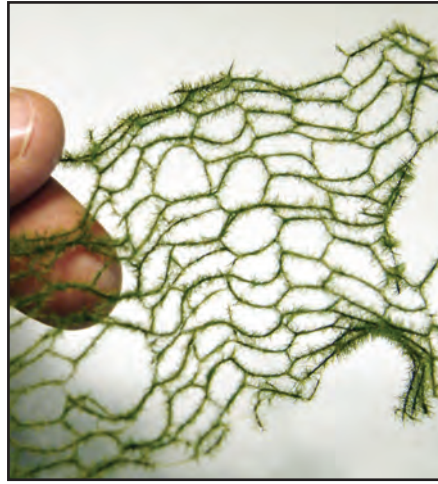
wood with a mix of raw sienna, titanium white, and a little cadmium yellow. Raw wood on real stumps varies from light pinkish-white to silver-gray, depending on how long ago the tree was cut.

I also like to add a "moss" effect on a few stumps. Mix a medium green with water to make a thin wash, and flow it on one side of the stump.

After the stumps have been colored, dry-brush them with white to help the texture stand out when they are buried in the woods on your layout.



The best way to hold lichen, Coarse Clump foliage, and other scenic textures on a steep embankment until the glue dries is to spear them in place with a pin or, on large pieces of lichen, finishing nails.



Silflor Horsetail foliage can be used to make cactus and, when covered with scenic foam, small bushes.



This buckhorn cholla cactus was modeled using Silflor Horsetail foliage. The Silflor was separated into less than 1/2" lengths and then the bottoms were twisted together, dipped in white glue, and "planted" in a hole punched in the scenic base. Dick Rotto layout

To plant the stumps on your scenery, put a drop of white glue on the base of each. Push the stump into place on the scenery and cover any glue that squeezes out with texture material. Fill gaps between the scenery and the stump with a drop or two of white glue and a little grass texture.

Making vines

Vines are a good way to tie man-made structures into the scenery. They give the viewer the impression that the structures

have been there a while, and they are also handy for covering gaps where the scenery doesn't quite fit with the surrounding structures. Vines and the low growth they represent can be used to break up large, flat areas of scenery, making them more interesting.

In Chapter 5, I discussed using Poly Fiber to make hanging vines and low bushes for large, textured areas. Another way to make vines is to use small twigs or pieces of SuperTrees for the branch structure, then cover the top of the twig

with green and brown scenic foam.

Glue the twigs in place with full-strength white glue. After the glue dries, use white glue applied with a fine-tipped brush to paint the area where the vine will go on the structure, starting at the twigs and spreading outward and upward in a tree-shaped pattern. Start at the bottom and work up the side, drawing the branches into fine tips.

Sprinkle on green texture material and press it into the glue with your fingers. After the glue dries, brush away the excess texture with a soft brush. Add more glue and texture to areas that look bare.

Vary the color of the vine leaves by painting them with thinned green paint. The foam will wick the paint from the brush up and into the vine. After the paint dries, dry-brush the highlights yellow and add small areas of brown to simulate dead leaves.

Making weeds

Weeds are a nuisance we try to keep out of our yard, but they are an important detail element that adds realism to a railroad layout. I've already mentioned many of the materials I use for weeds: Silflor, clippings left over from tree-making, pieces of foam-covered lichen, little sections of tree branches, and clumps of texture material. With weeds as with trees, variety is the key to realism. I'm constantly on the lookout for new materials to use as nondescript growth.

One of the best places to find weed materials is at a craft store. Check its inventory of dried flower materials.

Green indoor-outdoor carpeting makes convincing weeds and tall grass. Clip clumps from the carpet backing with side-cutting pliers, dip them in glue, and place them in drilled holes in the scenery.

Weeds look better if you vary their color. Dry-brush them with light green or brown to add highlights and to make the tops of the weeds look dried out.

Woodland Scenics Field Grass makes great-looking weeds. Available in four colors, it is ideal for clusters of weeds and hedgerows. Spread the Field Grass out on newspaper, keeping the fiber strands as parallel as possible to get a thin cross section of Field Grass. Use

your fingertips to push the parallel strands out toward the edges of the paper. It's like stretching pizza dough to fit in a pan.

You want a thin layer of grass because it must be soaked with a heavy application of hair spray, and you want the spray to work through and bond all the fibers together. Spray one side of the grass, and when that's dry, flip it over and spray the other. Allow the whole thing to dry overnight.

Now you have a strip of Field Grass fibers bonded together so you can handle it and cut it without worrying about the individual strands falling apart.

Start by cutting the strip in half lengthwise. To make weeds, cut or tear off a small piece, roll it in your fingers to make it round, dip it in full-strength white glue, and plant it in a hole in the scenic shell. Make a weed cluster into a flowering shrub by dipping the top in diluted white glue and sprinkling on brightly colored foam.

As with trees, weeds should be placed in groups and clusters. Keep them standing straight and perpendicular, and mix in other detail items, like barrels, boxes, and fallen tree limbs. Don't bother planting weeds under trees or behind other objects where they cannot be seen.

Model hedgerows by cutting the Field Grass strip into long horizontal strips. Run the bottom of the strip through a puddle of white glue and stand the hedge upright around a yard, along a fence, or around a garden.

Scouring-pad weeds

I'm always on the hunt for inexpensive, readily available materials that I can use to build scenery. The synthetic materials used to make scouring pads, floor buffers, and furnace filters can be used in a variety of ways to add weed-like textures to model scenes.

These pads come in different degrees of coarseness and texture. Their color is not important. Just pull the pad or filter apart with your fingers (wearing work gloves helps) and trim it to shape. Tease it the rest of the way into a convincing weed shape, paint it with shades of green or brown, let it dry overnight, and plant it on the layout with white glue.



The author needed a lot of cactus plants for his Cactus Valley project railroad, including many in the foreground where convincing detail is important. He sprayed them with bonding spray and sprinkled on green flocking, which attached itself at different angles to look like spiny cactus needles.



These cattails were made by cutting bristles from a broom and dipping the tips in glue and then into brown foam. They were planted in a "puddle" of gloss medium at the water's edge.



Realistic bodies of water, large or small, add color and verisimilitude to your layout. The water on this “Lobster Cove” display was made by pouring EnviroTex over a flat, painted base. After the EnviroTex cured, waves were sculpted with acrylic gel.

Modeling water

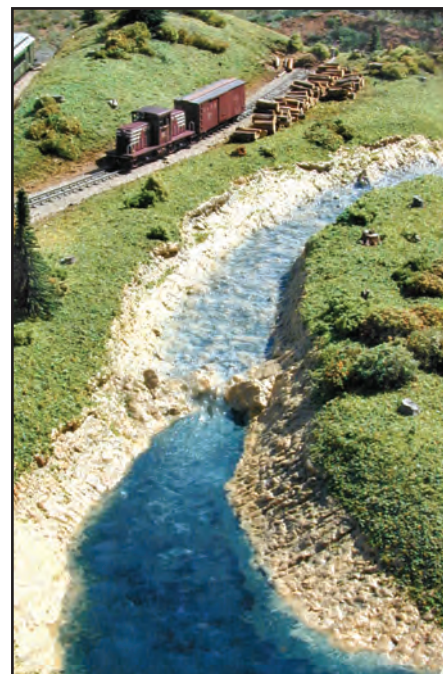
Realistic rivers, ponds, streams, lakes, and other bodies of water provide points of interest that are hard to beat for adding scenic variety to a model railroad layout. For years, modelers thought simulating water was difficult because it's a moving target. Model water has to look as it would in a photograph, frozen in time. But with the many new water-making materials now available, it's easy to model convincing water surfaces from Plexiglas, acrylic gloss medium, acrylic gloss gel, and EnviroTex two-part epoxy.

As with other aspects of scenery building, research is important. Real railroads follow waterways, so color reference photos or field trips can help you visualize the type of water feature you will want to duplicate on your layout.

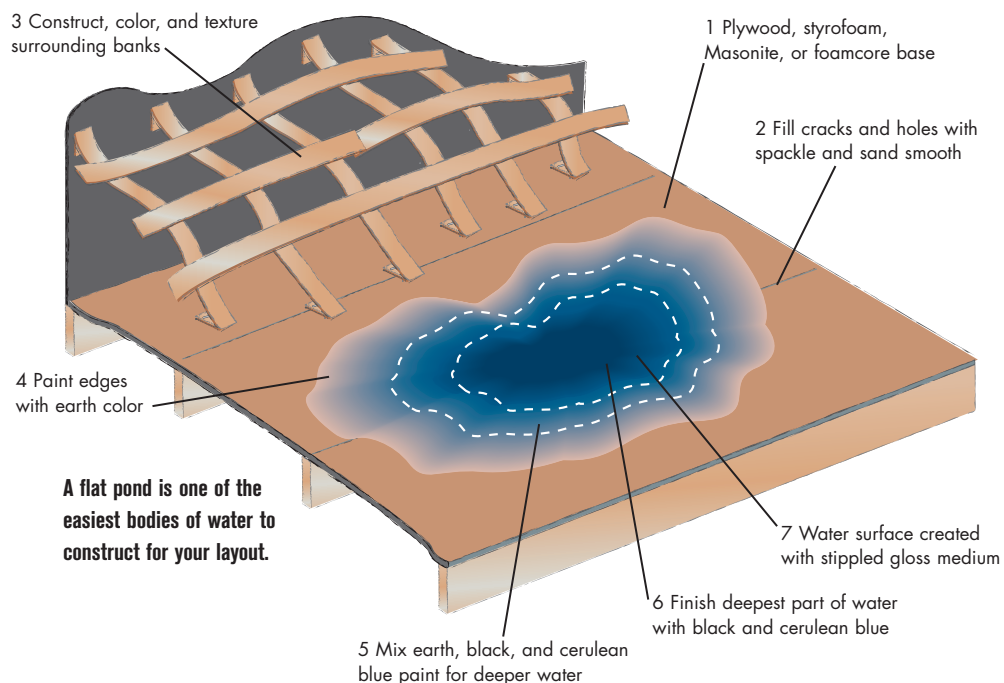
Adding the actual water surface should be done as close to the end of scenery construction as possible. Do all the prep work, including painting and detailing the bottom, but wait to finish the water until after texture has been added, the track is ballasted, and the rest of the layout is in place. This will ensure that the water stays fresh and shiny as long as possible.



The base of this pond is a piece of foamcore painted black, cerulean blue, medium green and titanium white. Woodland Scenics Realistic Water was then poured on to create the realistic glossy surface. Alan Rieper layout



All this creek needs is a layer of gloss medium to replicate the water surface and coat of gloss varnish to seal it. Bob Hayden module



To build water using the methods described in this chapter, you'll need one or more of these products: Woodland Scenics Realistic Water, Woodland Scenics Water Effects, high-gloss acrylic varnish, acrylic gel, and acrylic gloss medium.

Preparing a flat base

Flat, calm water on ponds, lakes, and slow-moving rivers is the easiest to model. Build a water base where the lake or pond will be located, using plywood, foamcore, Styrofoam, or Masonite.

For realistic banks in HO scale, the top of the water base should be 1½" to 2" below the surrounding scenery. The base should be firmly fastened to the tabletop or benchwork, and it must be flat and

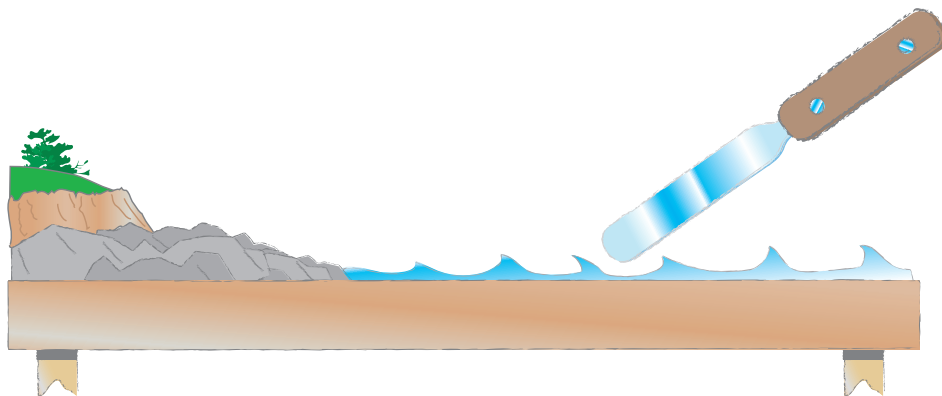
level even if the surrounding terrain is uneven.

Do all the color and texture work on the surrounding banks, beaches, and shallows before building the water. Fill cracks or holes in the base with spackle and allow it to dry overnight. Sand the base smooth to remove splinters, fuzz, and rough spots, then vacuum the surface. Give the base a primer coat of full-strength flat black or scenery black.

Lake and pond bottoms

After the base is prepared, the next step is to color the bottom. You'll need acrylic paint in three colors: black, cerulean blue, and earth. Start by painting the banks and extending the earth color down to the edges of the water. You don't have to be too precise here.

Paint the center of the pond flat black, working it to the edges of the earth color on the banks. Bring the black up and into the earth color with a stippling (stabbing) motion. Then put a small dab of blue on the brush and stipple this, starting in the deepest area and working the color out to the shallows. This step will tint the black and some of the earth colors with a hint of reflected sky.



The surface of the ocean is much choppiier than an inland pond; use the edge of a palette knife or tongue depressor to shape acrylic gloss gel into parallel waves.



Mix cerulean blue and black on the water surface to replicate the color of deep water. These colors will be brought up to the edge of the rocks, and a little earth color will be added to the shallow areas.

Make a smooth transition between the wet earth color and the black by misting the area where the colors overlap with wet water. Gently stipple the colors together with a clean China-bristle brush, then let everything dry overnight.

Evaluate how the water looks the next day. If it needs more blue or earth, add it now. If you don't like how the base looks, keep working until you have the results that you like. Once you're satisfied with the look of the bottom, seal it with a coat of full-strength acrylic matte medium or flat acrylic furniture varnish.

Ocean painting

I love the ocean and have tried for years to capture its beauty in model scenes. I spent many hours in maritime museums and libraries studying paintings and seascapes to learn ocean-painting techniques. Armed with the impressions

of color and movement that great artists created, I set out to duplicate those effects in three dimensions.

What color is ocean water? The answer depends upon where you're modeling. Those of us living along the coast in New England see the ocean as steely silver-gray on overcast days and bright blue on sunny days. In other parts of the world, the water looks much different.

Generally, water looks blue to us because we see the color of the sky reflected in it. The shiny surfaces applied to our model water should do the same.

If we want our water to look blue to eye-level viewers, we'll have to paint the base blue or provide a blue backdrop. I use both methods because many layouts are viewed from high above, as if from an airplane looking down.

The colors you need to simulate deep ocean water are titanium white, cerulean

blue, medium green, and black. As with the pond bottom, paint earth color on the shore and out into shallow areas to represent sand and sandbars. Then, starting in the deep areas, stipple in black using a 2" China-bristle brush.

Use a piece of scrap cardboard as a palette and put dollops green, white, black, and blue on it. While the black on the layout is still wet, pick up a little blue and green and stipple them into the black to soften the color.

Using the same brush, pick up a little more of the blue and black and add some white. Stipple these colors up to the edge of the earth-colored shallows. Add a little green and white to the brush and stipple this into the shallow water.

Make the transition from the deep water to the shallow as gradual as you can. If the paint starts to dry, spray on some wet water to re-wet it so you can continue blending.

Simulate the tops of submerged rocks by mixing earth paint with just enough black to make a color that's a little lighter than the surrounding bottom. Also dot this color along the banks close to shore.

While the bottom paint dries, add details along the banks. These include seaweed (dark brown Silflor), sagebrush driftwood, logs, old tires, tufts of green Silflor grass, and pieces of broken pilings. Glue these in place with full-strength white glue.

Seal your ocean bottom with matte medium to protect it until the final gloss topcoat can be added.

Making streambeds

Streams look best near the front of a layout, where visitors can get a good view them. Streams can be built during any phase of construction—they can even be added after the rest of the scenery is complete.

The first step is to survey the landscape to select a spot where a stream will look like it belongs. It should go in an area that naturally runs downhill, so the stream has a reason to burble along.

For cardboard strip scenery, cut a wide ditch in the scenery surface and line it with pieces of plaster cloth. If the underlying material is polyurethane foam, dig away enough foam to provide room for sloping banks and the stones



If you're modeling tropical waters, add more medium green to the base color. Here, medium green, cerulean blue, and black are mixed to make this water.



Begin by applying earth-colored paint on the shore, and then extend it out into the water area, where it can be blended with the ocean bottom color.



The author blends the sand-colored beach and the darker deep water to make a gradual transition from shallow water to deep on this waterfront module.



The author blended the sand on this beach into the deeper water by misting the area between the two with wet water while the colors were still wet.



The seaweed on this waterfront was made by mixing brown scenic foam with gloss medium. It was then painted along the tide line and around the pilings. After it had dried, more gloss medium was brushed over the seaweed to make it look dripping wet.



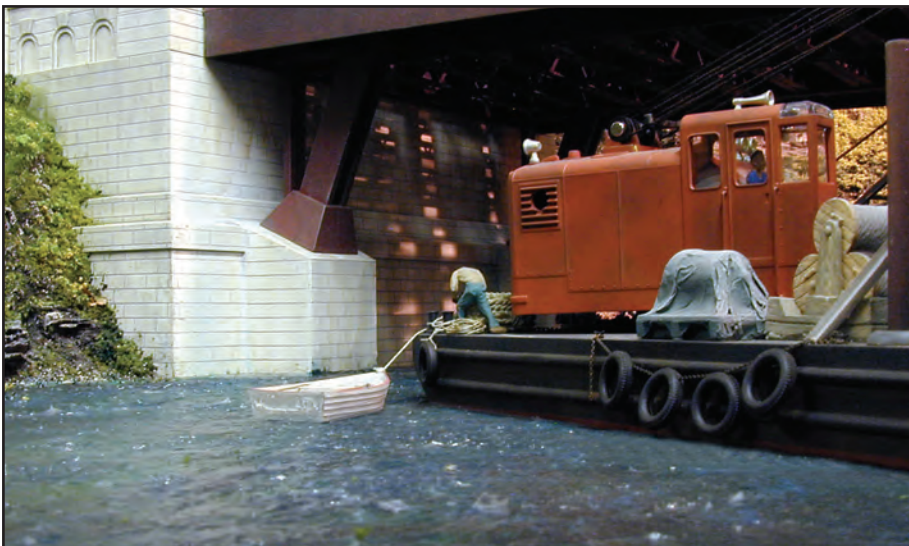
A China-bristle brush applied with a tapping motion is used here to blend colors on the water surface and get a more random color mix.



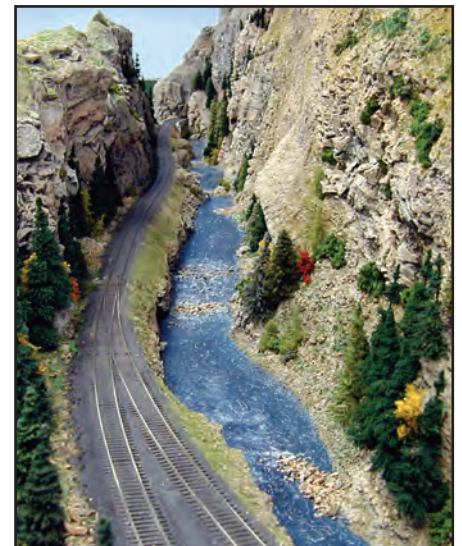
This stream bed was carved into a Styrofoam base, with banks molded from Sculptamold and real stones pushed into the wet Sculptamold.



Sometimes you have to alter the color of water to get the right effect. The water here is painted light blue so it can be seen way down in the canyon. The surface was finished with gloss medium. Joe Galdi layout



This water was resurfaced with acrylic gloss medium. The medium was painted on using a soft brush to get a gently rippled effect. Carl Chancey layout



Here's another view of the canyon in the photo above. The lighter color of the water also makes it look as though it is reflecting the bright mountain sky. Joe Galdi layout

that a stream deposits along its route.

If you need some special scenic contours, mix a small batch of Sculptamold and use it to model them. After 20 minutes or so, paint the new terrain with earth-colored paint.

For a mountain stream of fast-flowing water, you'll need two or three grades of stones. Collect several small sizes, from boulders down to coarse sand. These stones will line the streambed, starting with the sand at the bottom and the boulders on the top.

Larger pebbles sifted from a bag of construction sand will make realistic streambed stones. You may be able to find suitable small rocks at a hobby shop or pet store (aquarium gravel or

parakeet grit)—or even in your yard.

Sprinkle fine construction sand into the streambed, followed by coarser gravel, larger stones, and boulders. Use a large, soft brush to move them around. Finish by sprinkling more fine sand down the middle of the stream, along the banks, and wherever fast water would deposit it.

Mist the stones with wet water until they change color and the sand absorbs the water. Then, using a large eyedropper, soak the sand and stones with matte medium bonding liquid.

Drizzle on the matte medium until it starts to run off. Place paper towels around the edges or at the bottom of the stream to absorb runoff. Remove the

paper towels before they dry so they won't get stuck in place. Allow the streambed to dry overnight.

Check the stones the next day to make sure they're all secure. Glue loose ones in place with full-strength white glue.

When the glue is thoroughly dry, apply a basic black wash. Use a small brush to apply the wash between and around the stones in the stream. The point is not to color the stones, but to darken the space around and under them. After the black wash dries, dry-brush the stones and sand with basic earth color. Blend a little white into the earth, if needed.



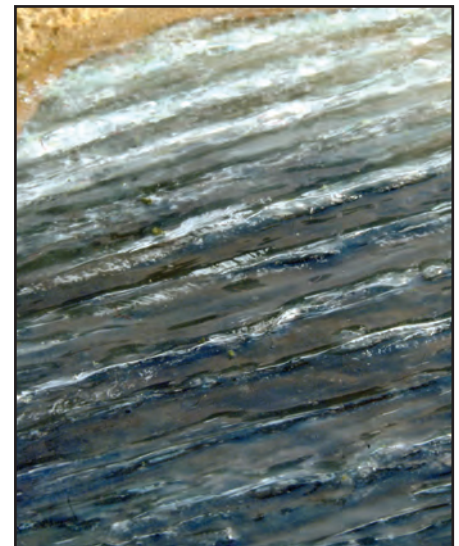
Gloss medium was painted on this water surface and stippled with a soft brush to achieve a rippled pattern. The medium will dry clear. Joe Galdi layout



For fast-moving water, use paint to show the lines of flow and acrylic gel to make the turbulent surface. The shine on this water was made by brushing on high-gloss acrylic furniture varnish.



Waves are easily modeled using acrylic gel. The gel has the consistency of soft butter and can be shaped using a brush or a palette knife. Hal Reynolds module



These nicely spaced ocean waves are acrylic gloss gel pushed into place with a straightedge. Several applications of gel were required before the waves looked right.

Gloss medium water

There are several ways to model the glossy surface of the water. One of the easiest materials to use is acrylic gloss medium (several brands are available at art and craft supply stores, including Mod Podge Gloss-Lustre and Liquitex Gloss Medium). This thick, white goo has the consistency of whipping cream but dries to a clear, hard, shiny surface. Because it has body, it can be worked into low waves and ripples. As with other water-soluble materials used to make scenery, cleanup with gloss medium is fast and easy.

Gloss-medium water can be modeled as fast as you can paint it on. Drying time varies from 30 minutes to several

days, depending on humidity and the thickness of the coat. Speed drying by warming the surface with a hair dryer.

Brush the gloss medium over the painted and detailed pond bottom or between the stones in a fast-flowing stream. Use a soft brush, pushing the medium around on the pond surface to make waves and ripples. Stipple the medium to produce a faster-moving, livelier water surface.

In a streambed, pile the medium against the backs of rocks and draw it out around them to model fast water flow. If you want higher waves or ripples, allow the first layer to dry, then add a second. You can change the look of the surface at any time by sanding

away the dried wave tops and applying a new layer of gloss medium.

Lightly brush white paint behind the rocks to make great-looking foam. Put down the white between applications of gloss medium. The medium will seal in the color and give it a glossy look.

Gloss medium can be tinted with a little blue acrylic paint for clean-looking water or with brown or universal tinting colors for muddy water. Add a few drops of color to ¼ cup of gloss medium, blend them well, and paint the mix onto a corner of the water area. Allow this to dry before evaluating the amount of additional tint to add.



This must be one of the calmest days ever on the Maine coast! Not a ripple in sight. The water was made with EnviroTex. To get ripples, EnviroTex water needs a coat of gloss medium.

Too little color can be corrected later on by adding more layers of tinted medium. As this first coat dries, the blue or brown color will show up only where the medium is thickest, giving just a hint of blue in the currents and ripples.

Acrylic modeling gel

Acrylic modeling paste and gel medium are thicker than gloss medium and will hold whatever shape you work them into until they dry clear. In addition to being compatible with all other acrylic products, these materials dry slowly so they can be worked for hours. I use paste or gel to model ocean waves and other rough water where height is required.

Apply the gel or paste with a wide brush, pulling it into peaks and any other shape you need. Allow at least 24 hours for the paste to dry.

EnviroTex water

Nothing beats EnviroTex for making a high-gloss still-water surface. A two-part (clear and gold) self-leveling epoxy, EnviroTex is available in craft, hobby, hardware, and some woodworking stores. Although more expensive than

gloss medium, it makes durable, mirror-like water.

EnviroTex gives off little or no odor while curing so it can be used indoors. Handled according to the manufacturer's directions, it is easy to use and yields repeatable results. Wear old clothes, rubber gloves, and eye protection when using this product. Several kits and quantities are available; a kit containing two half-pint containers will cover an area about four square feet.

When using EnviroTex, prepare the scenery base as for gloss medium. Also, make sure the surface is level so the epoxy doesn't run out on the floor. Make sure the surface is free of dust or texture particles that might cause the EnviroTex to dimple. If need be, sand the surface smooth and then repaint it.

If the water area extends to the edge of the layout, make a dam along the edge out of masking tape to keep the epoxy from escaping. Most important, seal all cracks or crevices—anywhere the liquid EnviroTex could leak out—with acrylic caulk, 5-minute epoxy, or white glue.

Read the instructions before you start. Measure equal amounts from each

container into paper cups. (I draw a line inside each cup the same distance from the bottom to get equal measurements.)

Mix the two parts together in a third disposable container (I use 16-ounce paper soup bowls). Cut one end of a wooden tongue depressor so it is square, and use it to mix the EnviroTex vigorously for about 2 minutes. This is important: Inadequate mixing will cause soft spots in the completed water.

When the epoxy is thoroughly mixed, paint some of it around the edges of the water area with a disposable brush (craft stores sell cheap art brushes in packs of 10). Then pour the rest of the EnviroTex in the middle of the water area, and work it to the edges with the mixing stick.

You have about 15 minutes to complete the pour before the EnviroTex starts to cure. Don't try to whip up the surface to make waves or ripples; this material is self-leveling.

Remove air bubbles from the water surface by breathing on it or by gently passing the flame of a butane torch near the surface. (Carbon dioxide reduces the surface tension of EnviroTex, allowing the bubbles to escape.)



You don't always need a lot of "water" to create realistic water effects. The creek bed under this bridge is mostly dry, except for a little pool of water visible just above the locomotive.



EnviroTex has been a favorite water-making epoxy since it was introduced. Also in this photo is a small container of blue dye for tinting EnviroTex.



The water flowing under this culvert was made using EnviroTex. The streambed was prepared by gluing small stones down the middle before the EnviroTex was poured in. Dick Rotto layout



EnviroTex has a slight gold color that helps make this backwater look slow-moving and stagnant.



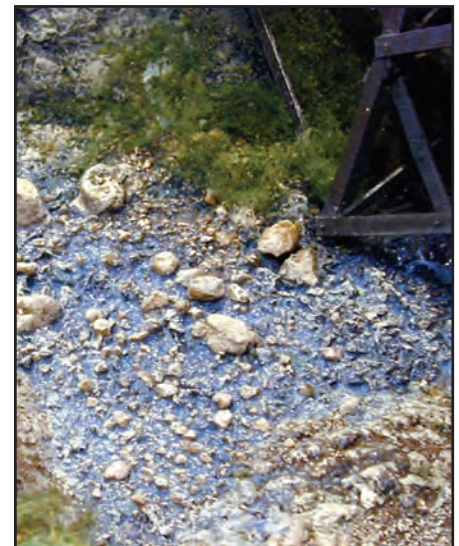
This Woodland Scenics Realistic Water has been tinted with blue acrylic paint. It looks garish now, but it will have only a slight blue tint after it dries.



Another acrylic product that makes shiny water is high-gloss acrylic varnish, sold in paint stores for finishing wood furniture and flooring. Prepare the water base using the water-making techniques described in this chapter and finish with the varnish. Carl Chancey layout



Acrylic gel dries clear, showing the color of the water base and providing surface texture. Foamy waves breaking on the rocks here were made by brushing titanium white acrylic paint onto the wave tops and finishing them with gloss varnish. Hal Reynolds module



You can create the effect of a blue sky reflected in water by tinting Woodland Scenics Realistic Water with a drop of blue acrylic paint before pouring it onto the water base. Dave Willis layout

EnviroTex sets in 5 to 7 hours. After about 12 hours (at 80 degrees), it will set hard and smooth, and it will cure completely in 72 hours. If possible, turn up the heat in your train room: The warmer the room, the faster the EnviroTex will cure. Keep dirt and dust off the surface until it cures. When it has cured, remove the masking tape along the front edge of the layout. The water surface will be smooth and hard and both water- and alcohol-resistant.

EnviroTex can be left as-is, or if you want, you can add waves, wakes, and ripples with gloss medium.

To model small streams and rivulets, mix up some EnviroTex and pour it

from the top of the stream, allowing it to slowly flow down, seeking its own level.

Small waterfalls can be modeled with the fuzz from a cotton swab. Put a little EnviroTex on the swab, place it against a rock, and unroll it so the cotton fibers span from the top of the drop-off to the water below. The fibers act as a wick for the EnviroTex, and the cotton fuzz adds a visual effect that resembles frothy water.

Woodland Scenics Realistic Water

Woodland Scenics offers a product for simulating the water called Realistic Water. It's a clear liquid you pour on the water surface. It dries flat, clear, and

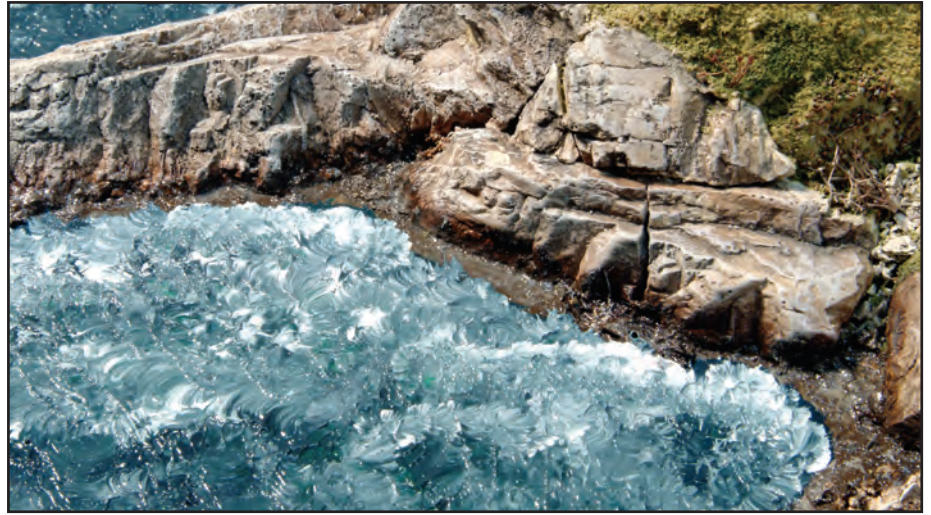
flexible in about 24 hours if you keep the application less than $\frac{1}{8}$ " thick. Apply multiple layers of Realistic Water, one on top of another, to build thickness. Allow each layer to dry completely before pouring the next.

I've had success tinting Realistic Water with a drop or two of cerulean blue acrylic paint. Add a drop to the bottle and shake or stir. It's easy to add too much tint, so start with one drop and work up, evaluating the color intensity by pouring a drop or two on a piece of white cardboard.

The Realistic Water surface is fairly soft after it dries, so I coat it with acrylic



Titanium white stippled over these falls and into the pond create the effect of rushing, turbulent water.



Plenty of titanium white acrylic paint was mixed with gloss medium and stippled onto still-wet blue and black base colors to show wave action in this ocean scene. Hal Reynolds module



These waves were “wrapped” around the pilings by vigorously dabbing on titanium white acrylic paint and gloss medium to get a white froth.

gloss varnish to seal it and provide a hard, shiny surface.

Plexiglas water

You can build flat, calm water with a sheet of Plexiglas just as you would build the base for other water features with plywood or Masonite. Paint the underside of the Plexiglas to look like deep water and then apply gloss-medium water to texture the top.

Mix and apply the acrylic colors to the Plexiglas the same way you would apply them to a regular base (as described in “Lake and Pond Bottoms” earlier in this chapter), but remember that you’ll be working in reverse. Start by stippling on earth in the shallow

areas, followed by black, cerulean blue, and a little medium green.

Blend the colors as you go, adding a drop or two of water to keep the paint wet enough to spread. Turn over the Plexiglas to evaluate the surface. When you’re satisfied, allow the paint to dry several days before handling, then texture the top surface with acrylic gloss medium.

You can also use Plexiglas to make see-through water and create the illusion of depth. Build up the surface with several coats of gloss medium to get it thick enough to create a “looking-through-water” illusion. As more coats are added, you can model waves, boat wakes, and ripples around pilings.



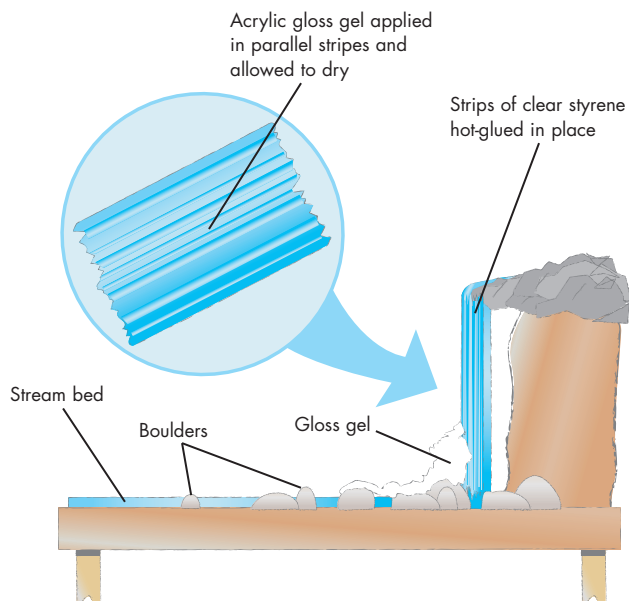
The water flowing from this pipe was made by squeezing a ribbon of Woodland Scenics Water Effects from the pipe down into the stream.

Accentuate the waves by dry-brushing their tops with white acrylic, then seal the surface with another coat of gloss medium.

Lake Film

One of the simplest ways to build water is to use textured plastic. One product I’ve tried is called Lake Film, made by Noch. This is a vacuum-formed sheet of tinted transparent plastic with realistic ripple texture on both sides. The sheet I used was 19³/₄” by 29³/₄” — big enough for most small-scale ponds, lakes, and waterfronts.

Lake Film is designed to be placed directly on a flat, painted surface. It comes



You can build a realistic waterfall in an hour with strips of clear styrene and acrylic gloss gel or Woodland Scenics Realistic water.



On this waterfall, Woodland Scenics Water Effects was applied in vertical stripes over a clear plastic base. Titanium white paint and acrylic gloss medium were brushed on for surface texture and to simulate fast-flowing water. Alan Rieper layout

rolled up, so the first step is to flatten it. You can do this several ways. Roll it in the opposite direction and store it that way for a while, or roll it out flat and put heavy books or a sheet of plywood on top until it flattens. You can also warm the back with a heat gun set on low until the plastic relaxes, then place a few weights on it to hold it flat as it cools.

To make a small pond with Lake Film,

start by building the banks. I like to use Styrofoam as the scenic base for water areas. I cut away enough Styrofoam to get an irregular sloping bank that I cover with Sculptamold.

Use the same bottom-painting technique as described at the beginning of this chapter in "Lake and Pond Bottoms." Paint the flat Styrofoam pond bottom with black, earth, medium green,

and a little cerulean blue. Before the paint dries, stipple on diluted earth to color the shallow areas.

Make a cardboard template of the pond bottom, and transfer this to the Lake Film. Cut the shape out of the film and set it into place, checking to be sure it fits properly.

There's only one invisible way to glue Lake Film to the bottom of the pond without traces of the glue showing. After trying (and failing) with white glue and super glue, I tried coating the back of the Lake Film with 5-minute epoxy, which doesn't need air to cure. It worked; here's how:

Apply the epoxy to the underside of the film and spread it with the side of a craft stick. Lay the Lake Film onto the painted pond bottom and weight it until the epoxy hardens. The bond is not only strong, but the epoxy gives the underside of the water a nice "wet" look.

To finish, cover the Lake Film edges with Silflor grass, dirt and stones.

PUDDLES AND DRIPS

One way to make small areas of water—puddles, standing water, or water running from pipes, for example—is with 5-minute epoxy. Mix the clear epoxy according to the directions, and coax or dribble it into place with a toothpick.

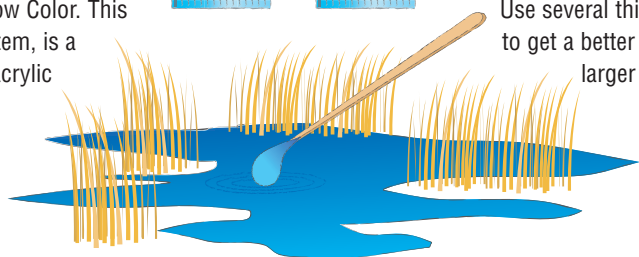
Another good water product is called Gallery Glass Window Color. This craft-store item, is a high-gloss acrylic varnish that dries crystal

clear. (A drop of it also can be "stretched" with a toothpick to make window

glazing for your structures.)

To make a puddle, just put a drop or two of Gallery Glass Window Color where you want the puddle, let it spread out, and let it dry. It looks great in a ditch alongside a track, in a rain barrel, as a puddle on top of a flat roof, or atop a water tank.

Use several thin layers to get a better effect on larger puddles.





The little waterfall in the middle of this stream was made with Woodland Scenics Water Effects. Bob Hayden module



Because of the difficulty in reaching their location, the author built these waterfalls off the layout, then coated the top of the falls with Water Effects and stuck them in place. He taped a brush to a stick to reach the tops of the falls and blend the Water Effects into the cliff. Dave Willis layout

the surrounding terrain. Higher is better, because it looks more dramatic.

Build a rock face with one outcropping perpendicular to the others, providing a shelf for the water to run over. Stack the rocks so they look as though water has worn them away. At the base of the falls, place a handful of boulders and spread them around with a large brush to look as though swiftly moving water has pushed them into position. Hold the boulders in place with matte medium spray.

Make the base for the falling water from strips of clear sheet styrene (see illustration on page 96). Cut the sheet styrene into strips of varying width as long as the height of the falls. Randomly score each strip parallel with the edges. This step allows the strips to be bent to conform to the contours of the rock without breaking. The scored lines also help establish the look of rapidly running water.

Streak the backs of the strips with a thin application of cerulean blue acrylic paint. Go easy: A little color is better than a lot. You just want to tint the backs of the strips.

Glue each strip to the front edge of the overhanging lip with white glue or 5-minute epoxy. Hold them in place until the glue sets. The strips must hang straight down; nothing looks as phony as water defying gravity by falling at a 30-degree angle!

If the waterfall is very high, the plastic strips may sag or buckle in the middle. To give the clear plastic strength, coat the falls with 5-minute epoxy. Brush the epoxy over the strips, and allow the excess to run into the rocks.

After the first application, brush on another from top to bottom until the strips are thick enough to be self-supporting without sagging. Smooth out epoxy that runs into the rocks at the base of the falls to eliminate puddles.

After 30 minutes, the epoxy will have cured enough for you to finish the falls in one of several ways. The easiest is to apply gloss medium or gloss gel onto the front of the plastic strips with a stiff brush. Rake the wet acrylic from top to bottom with the brush or an old comb to produce parallel grooves.

After that, add gloss-medium water to the upper and lower streambeds, pushing it up to and over the top edge of the falls to blend smoothly. When this dries, streak the falls with titanium white and seal the color with more gloss medium.

Instead of epoxy and gloss medium, you can also use EnviroTex for the water. Brush it onto the plastic. It will seek the lowest level, so it will slowly run down the face of the falls. You'll have to hang around and brush the EnviroTex up from the base of the falls back toward the top. After a while, it will get stiff and stay put on the vertical surface.

Another way to create water falls is with Woodland Scenics Water Effects. This product is a stiff, acrylic gel sold in plastic squeeze bottles at most hobby shops. To use it for a waterfall, build the rocks and add the clear plastic strips as described above.

Next, squeeze parallel strips of Water Effects onto a Teflon cookie sheet. Make enough strips to more than cover the length and the width of the falls. Let the strips dry, but be patient: The product can take up to a week to become clear. When the strips are fully dry, carefully lift them off the Teflon sheet and hold them against the plastic.

Trim the Water Effects water with scissors to fit over the clear plastic falls. Apply a dab of Water Effects along the top edge, sides, and bottom of the clear styrene and push each strip into place. Finish the top and bottom of the falls with more Water Effects or with Woodland Scenics Realistic Water.

Don't forget to add mist and spray at the bottom of the falls. Tease white poly fiber pillow stuffing into a fine spider web thickness and push the bottom edge of the fiber into the still-wet acrylic or EnviroTex at the base of the falls. Gently pull most of the fiber away, leaving a wispy mist.

Visitors impressed by your layout's realistic waterfall will want to know how you made it. Whether you share the secret is up to you!



The background is as important as the scenery on your railroad. The foreground scenery on Dick Rotto's layout merges with the background to create the illusion is that it goes on forever.

Backdrops and background scenery

The purpose of the backdrop behind your model railroad is to reinforce the illusion of realism. You can have the best painted and detailed locomotive, but if it's running on bare benchwork against a dark concrete basement wall, all your fine work will be for naught.

Even a simple backdrop will eliminate the surrounding clutter and make viewers focus on your trains. Adding a hazy blue-white sky and gently rolling hills provides a natural, realistic extension of the foreground scenery. It suggests that vast distances await beyond the horizon. It doesn't have to be elaborate. Nothing is more distracting than a backdrop with a poorly rendered representation of the countryside that draws attention to itself rather than enhance and support the foreground scenery.

My preference is for simple backdrops: a background of simple colors blended to look like blue sky and distant mountains, all shrouded in a soft atmospheric haze. Less is more in this situation. You don't need artistic talent to paint this type of backdrop, and you'll love what it does for your layout.

The traditional place for the backdrop is behind your layout. It can be mounted on a wall or freestanding down the middle of the layout. It can even be hung on a frame and placed where convenient. The background on some layouts is a combination of all three.

Curved background materials

Backdrops can be built from a variety of materials. Because you usually need to curve the backdrop around the corners of a room, something flexible is needed.

Years ago, linoleum runner was popular among model railroaders. It was sold in 36"-wide rolls and used around the edges of a carpet to hide old-fashioned wide-board, softwood floors. It usually had a hardwood design printed on the side that faced up. Modelers flipped it over and painted their backdrops on the back side.

Linoleum runner is hard, if not impossible, to find today. If you want to use linoleum for your background, large carpet outlets and most home improvement stores sell linoleum remnants. They'll usually slice the remnants into the width you need.

Because linoleum is not made to be hung on a wall, it tends to sag after a while. You'll need a lot of bracing and support. This means building a grid of strapping or other lightweight wood to provide a nailing surface every 2' or so for the length of the backdrop.

Another potential problem with linoleum is that the seams where pieces join must be taped and spackled. Try to do this after the linoleum has been up for a while and has acclimated to the conditions of the room.

I have used both 1/4" Luan plywood and 1/4" Luan Wigglewood for backdrops. Wigglewood is made with a soft center so it can be bent, curved, and rolled. It is used to build custom arches, ultralight airplane wings, camper interiors, and other items where the wood needs to flex without cracking. Wigglewood is sold in



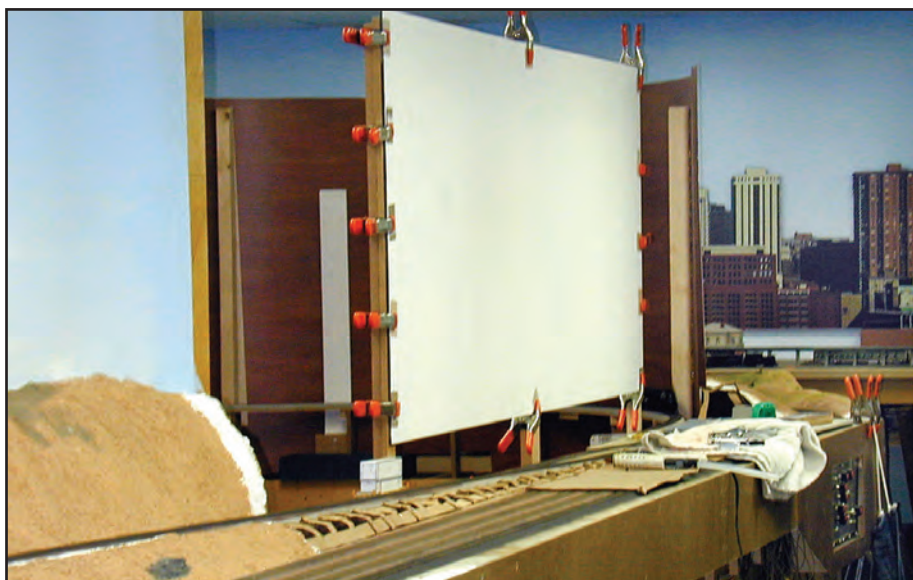
Fiberboard (also called Masonite) is a popular backdrop material. It will take a bout a 24" curve in the corner. Seams have to be taped, spackled, and sanded smooth.



The background on Steve McKeon's N scale layout is freestanding in many areas. The curved fiberboard here is supported by the backdrop facing the other side of the layout.



This fiberboard backdrop was mounted on a frame made from 1" strapping. The seams will be taped and spackled. Don Holloway layout



The background down the center of this layout is made from counter-top laminate. Laminate makes a good background material because it is stiff, stands on edge without sagging, and needs little support. Here it's being glued to support posts. Joe Galdi layout



Here's an around-the-room backdrop built from fiberboard. It was painted using rollers and blended in the middle with a brush and a spray can of flat white. Don Holloway layout



Simple enough: Paint backdrops by brushing blue on the top half and white on the bottom half. Blend the colors together where they meet in the middle.



After the base blue and white are down and blended together, mist on flat white spray paint in long, horizontal strokes to further blend the top and bottom colors and create a faint layer of clouds.

either 4' x 8' or 8' x 4' sheets, depending upon which way you need it to bend.

I use regular Luan plywood for straight backdrop sections and Wigglewood for corners and coves. A 4' x 8' sheet of Wigglewood is hard to handle alone, so bring help when you visit the lumberyard. Luan needs several coats of primer with a good sanding between each coat before the backdrop can be painted on it.

Fiberboard (also called Masonite) has worked great for me as profile boards and backdrops for dozens of model railroad projects. I've used both tempered and untempered fiberboard mounted smooth side out. I prefer the untempered material because it's not as hard as the tempered. It is also easier to drill and bend.

BACKDROP COLORS

Here are formulas for some of the basic backdrop colors discussed in this chapter.

Background blue sky

Each of these sky colors will provide a good starting point. Listed in no particular order, they all should be flat indoor wall paint.

- Benjamin Moore 2B-790 Bayberry Blue*
- Dutch Boy 13F-5 Bay City Blue
- Dutch Boy 14F-5 Roller Coaster Blue
- Sears Easy Living AA321 Royal Blue Medium Light
- Sears Easy Living CC333 Royal Blue Medium Bright

Most-distant mountains

- 1 part black
- 1 part light green
- 3 parts white

White is the most important color in this formula. If the distant mountains seem too dark, add more white to the mixture. They should be only slightly darker than the sky behind them.

Middle-distance mountains

- 1 part black
- 3 parts light green
- 3 parts white

Closest mountains

- 1 part black
- 3 parts light green
- 1 part white

All three colors can be mixed from the “most-distant color” just by adding more green to it. Make sure you mix enough of the most-distant color to complete the background. Always test new color combinations on scrap poster board before applying them to your backdrop.

*Benjamin Moore offers 2-ounce sample jars of its paints; consider sampling several sky blues before settling on one.



The simple sprayed-on blue-and-white background adds depth and realism to almost any scene without drawing attention to itself. It's easy and fast—and you don't need to be an artistic genius to paint it.



These rain clouds on Dick Rotto's layout were painted by Jim Vogel. The trick was to darken the foreground scenery in the shadow of the clouds. Jim did this by using muted colors and, with the author's help, mixed a little blue into the scenic foam used to make the three-dimensional scenery under the shadow.

I've taped and spackled joints between the fiberboard panels with moderate success. The joints will crack over time if you have wide swings of temperature and humidity. Taping the seams with fiberglass tape yields better results.

To fit fiberboard around curves, wet the back of the board and bend it; 24"-radius curves are about as tight as you should try to go. Once fiberboard dries, it stays put and holds the curve. It takes paint well, but needs several coats of primer to keep the paint from being absorbed into the surface.

I've used Kömatex on several display railroads where parts of the backdrop had to be freestanding but also had to curve. Kömatex is a lightweight, matte-surfaced PVC board with a closed-cell foam center. Used mainly for making outdoor signs, Kömatex is available in 4' × 8' sheets from plastics dealers. It comes in several thicknesses; the most useful thickness for model railroad backdrops is 3 millimeters (about $\frac{1}{8}$ "). Kömatex comes in white and several other colors. It's inexpensive and easy to cut and curve, and it accepts all types of paint without surface blistering or

puckering. It will bend around corners and is impervious to ultraviolet light and most solvents.

Kömatex is ideal for backdrops that are mounted on the surface of a layout. It's light yet stiff enough to hold up its own weight, and it will stand on edge with little support.

Flat backgrounds

If you are building a small home layout or portable module, you need only a stiff, flat background that's tough and will take paint well. The materials listed above may be used for flat backdrops, but lightweight materials are better for portable backgrounds.

Sheet Styrofoam will take a lot of abuse, which makes it a good choice for layouts that are moved around. Styrofoam sheet is light enough that it can be attached to the back of a module with Velcro strips. I use 1" sheet Styrofoam for module backdrops. Cut the foam to the length and height you need, and give both sides two or three heavy coats of flat white primer.

Foamcore is a lightweight, rigid board available at art supply and craft stores. It

consists of two sheets of heavy paper with styrene foam sandwiched in the center. Foamcore comes in thicknesses ranging from $\frac{1}{2}$ " to 1" in 30" × 40" and 40" × 60" sheets (sizes up to 4' × 8' are available on special order).

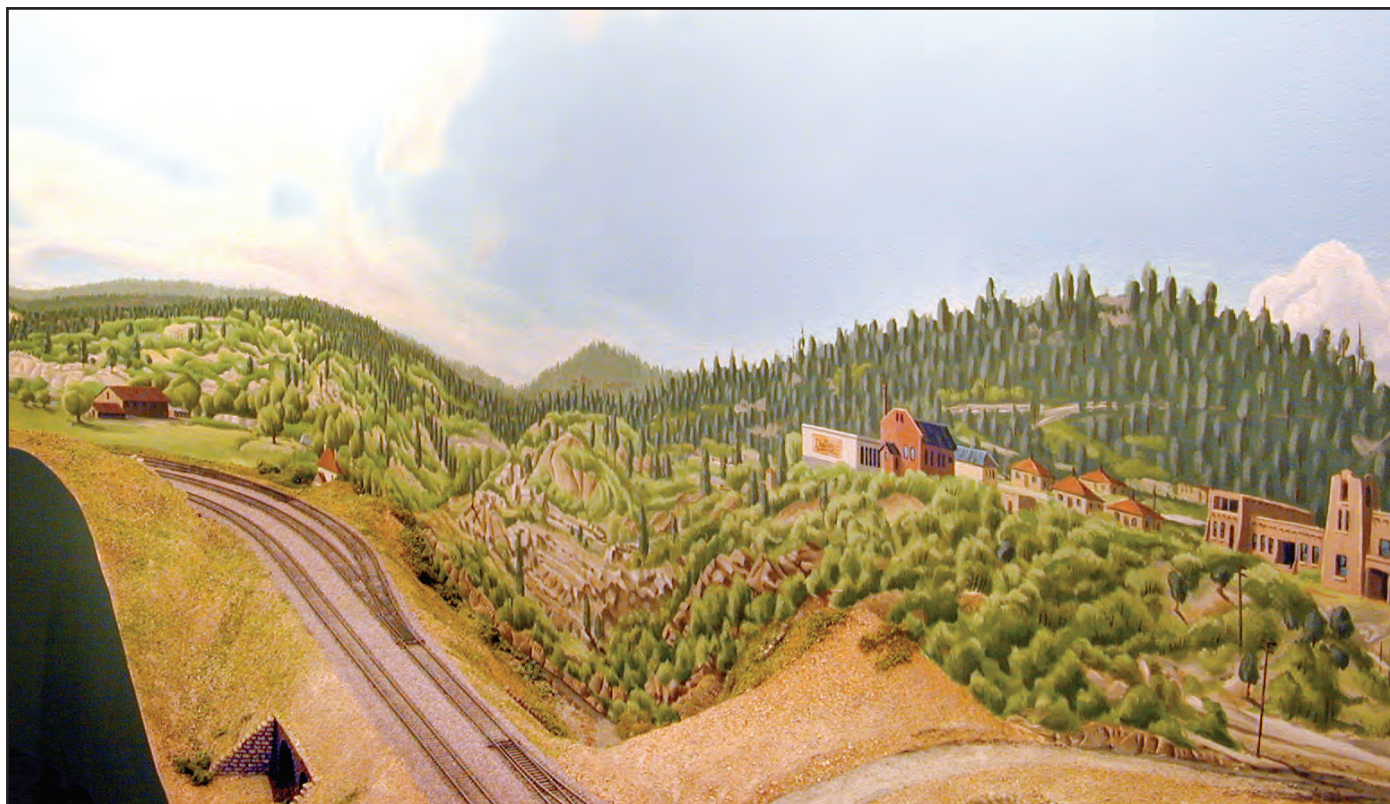
Similar to foamcore, Gatorboard consists of sheets of hard, resin-impregnated paper with a polystyrene foam center. Available from plastics dealers, it's available $\frac{3}{16}$ " to $\frac{1}{2}$ " thick in sheets as large as 4' × 8'. Gatorboard is used for mounting photos and building store displays.

Laminate is the stuff glued over home countertops and used to protect the walls in restaurant kitchens (Formica is one brand). Because laminate does not expand or contract, it's a good choice for backdrops in damp locations. The seams can be taped and spackled. Home improvement stores usually have a large selection.

Painting the backdrop

You don't need a lot of artistic ability to turn a piece of backdrop material into a great-looking background. By following a few easy steps and practicing on scrap material, you can paint like a pro.

The first step is to select a sky color. I borrowed my first sky blue from an



Jim Vogel's clever use of clouds on the curve of this backdrop helps conceal from the viewer the sharp U-shaped curve of the tracks. Dick Rotto layout.

article in *Model Railroader* magazine. The color was Sears CC333 Royal Blue Medium Bright flat latex wall paint. This is a nice starter color because it's neither too dark nor too light.

To check a sky color, take the paint chip outdoors at noon on a clear, bright day and hold it up to the sky. The color on the chip should be very close. Other blues are listed in the sidebar on page 101.

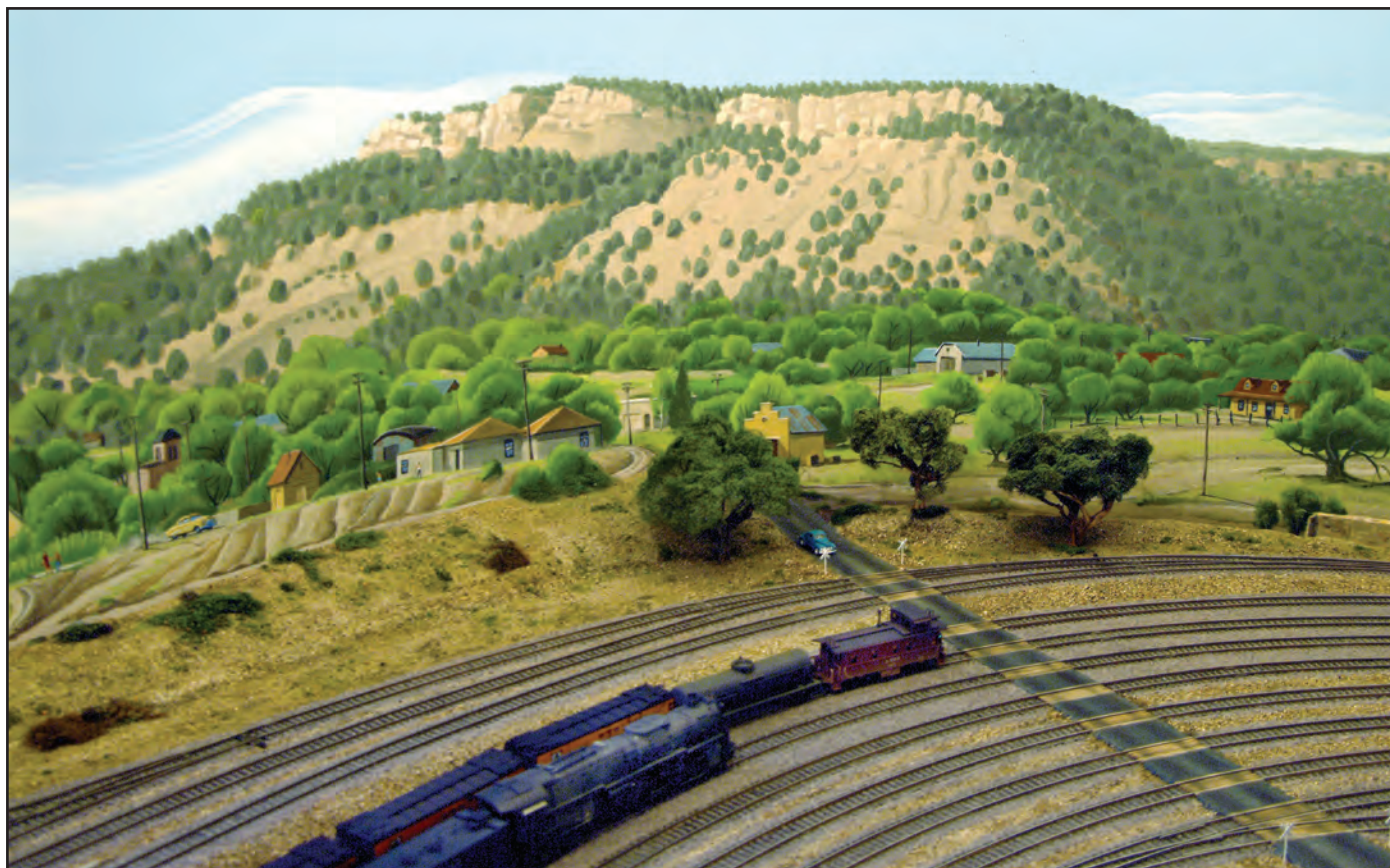
Your sky color can also be custom-mixed. Bring a sample or paint chip to a paint store and ask the clerk to mix several quarts (as many as you think you'll need, plus an extra quart) of the color in a flat interior latex.

Also buy a couple of quarts of flat white, a couple of plastic roller trays, paint rollers, and a wide brush. If you feel adventuresome and want to paint a few clouds and mountains, pick up a spray can of flat white. Simple cardboard stencils can be used for those features.

Before starting to paint, think about how the real sky looks. On a bright, cloudless day, the sky directly overhead is deep blue, while the horizon is much lighter. I paint backgrounds with deep blue at the top, graduating almost to white at the bottom. This works for most areas of the country, except perhaps heavily polluted city scenes, where the



The thunderhead makes a stunning backdrop for this train heading toward Raton Pass in Dick Rotto's layout.



Here's a great example of using a bold background scene to hide the corner of a layout. The road approaches the background and twists away to disappear into the trees where the background meets the foreground.
Dick Rotto layout



All the structures on this section of Dick Rotto's layout were painted on the backdrop because foreground space was limited.

color at the horizon would be more gray, yellow, or brown.

Begin by priming your backdrop with several coats of full-strength flat white paint. Sand between coats, if necessary, and then wipe the background with a damp cloth to remove dust before applying the next coat of paint.

Pour blue paint into one roller tray and white into another; fill a shallow bowl about half full with water. The water is where you'll put your brush if the phone rings or nature calls. We'll also use it to blend the colors.

I use two paint rollers and a wide brush, so I can alternate quickly between applying the blue and white. In the middle overlap area, I use the brush to blend the colors.

If you must paint your backdrop in more than one session, slip the paint rollers into plastic bags and twist the open end of the bag around the handles. The bags will keep the rollers fresh for several weeks.

Start by rolling full-strength sky blue on the top third of the backdrop. Then apply the white on the bottom third, working from the bottom up. Dip the brush in the blue, then in the white,



Jim Vogel painted this village in an area of Steve McKeon's layout where the background is close to the front edge. Trees and shrubs on the foreground hill will mask some of it while maintaining the illusion of depth.

and paint a stripe of blue/white across the middle of the backdrop between the two colors.

Blend this stripe up into the blue using long, horizontal strokes. Then work from the middle down, gradually blending the blue into the white at the bottom.

For a smooth transition between blue and white, you may have to use a little water or more paint to smooth out lines and fix mistakes. Subtle lines or streaks where the colors meet are okay. To judge how the transition looks, step back as far as you can and squint.

Let the sky paint dry and evaluate your work the next day. Don't be afraid to repaint an area—or the entire backdrop—if you have to. The sky should look the way you want before you tackle clouds and mountains.

Painting clouds

We've already added some clouds and atmospheric haze to the backdrop just by blending white into the blue. We can take this one step further and create the illusion of light, feathery clouds by misting the background using flat white spray paint.



Here's an extreme close-up of Dick Rotto's layout showing HO scale figures Jim Vogel painted on the backdrop. Compare them with the HO vehicle and figure to the left.



Unfinished three-dimensional scenery in the foreground rises as it approaches, but doesn't quite touch, the painted background in Dick Rotto's layout.



George Sellios effectively integrated printed cloud backdrops into his layout.



The blue on this background was brush-painted up to the scenery, and then the little trees were added. The clouds were hand-painted using a soft, round brush. Joe Galdi layout

There will be some overspray, so cover the layout with an old sheet or plastic drop cloth. Wear a respirator that will remove paint particles, volatile solvents, and other harmful compounds from the air.

Hold the spray can away from the backdrop so the paint “puffs” on. Spray lightly, in long horizontal strokes. All you want to do is add a streak of light haze up into the blue. It’s a good idea to practice cloud painting on an old piece of fiberboard or other smooth surface to get the hang of it before you paint the backdrop.

After the haze dries, you may want to spray on a few clouds. An easy way to do this is with stencils. New London Industries offers several different cloud and hill stencils, plus an instructional video on using them.

To make your own stencils, draw a cloud-top outline along one edge of a sheet of cardboard or poster board and cut it out with scissors. You can be as outrageous as you want, but keep the shapes smooth and rounded. Turn the cardboard on its side and make another cloud top. Continue until you have four different cloud stencils.

Make a second set of stencils with different shapes. Now you’ll have eight different stencils that can be used on either side, giving you 16 combinations. Along with your stencils, you’ll need latex



Cut cloud stencils from poster board and hold them about an inch from the backdrop when you spray the paint so you don’t get a hard line at the top of the cloud.



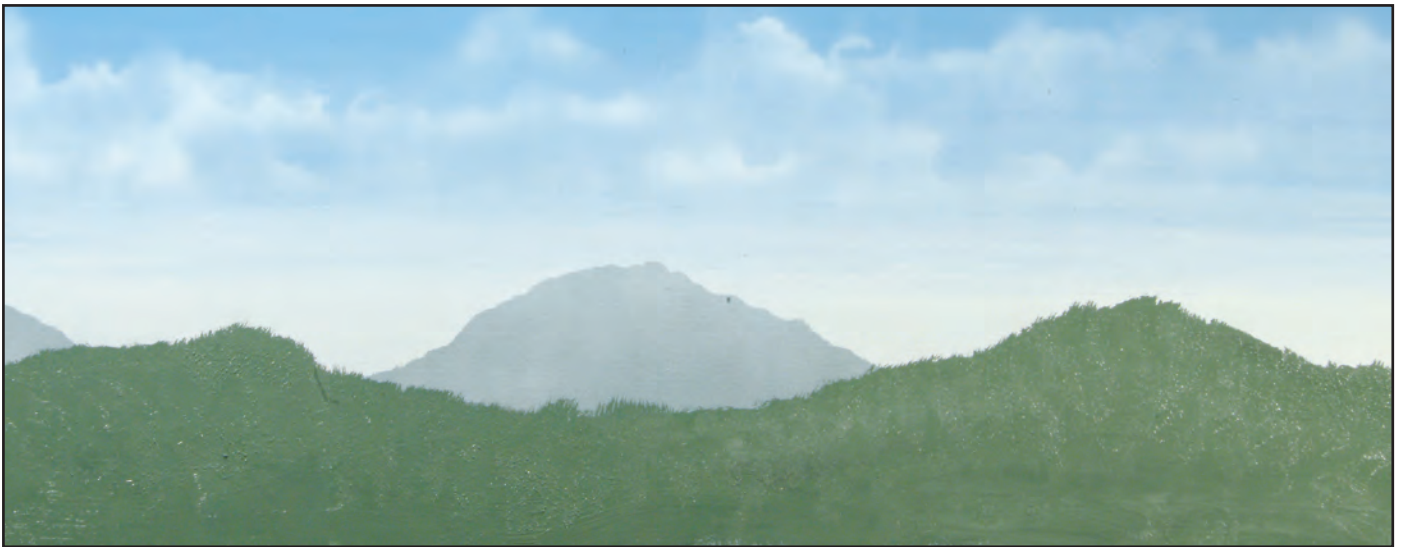
One of the easiest tricks to create the illusion of distance is to run a road into the backdrop. The road should curve so it runs out of sight behind the trees and not straight into the backdrop. Dick Rotto layout



George Sellios painted smoke and clouds on a printed backdrop to help hide seams and give the background of his Franklin & South Manchester more depth.



When painting mountains on the backdrop, start with the most distant color—light gray mixed with a little green. After it dries, mist flat white on it to create a layer of separation between this mountain and the one that will be painted in front of it.



The second mountain range is painted in front of the first with more green in the color to suggest that it's closer to the viewer.



This backdrop is complete. There are three layers of hills, each one greener than the one behind as they come toward the foreground.

gloves, several cans of flat white and light gray spray paints, and your respirator.

Decide where the highest clouds will be. Clouds at eye level look great if your railroad is high, but if your layout is only 30" from the floor, you'll have to paint them lower. In HO scale, I paint them about 12" above the layout's horizon line. High clouds made with stencils look like you are viewing them from above, riding in an airplane.

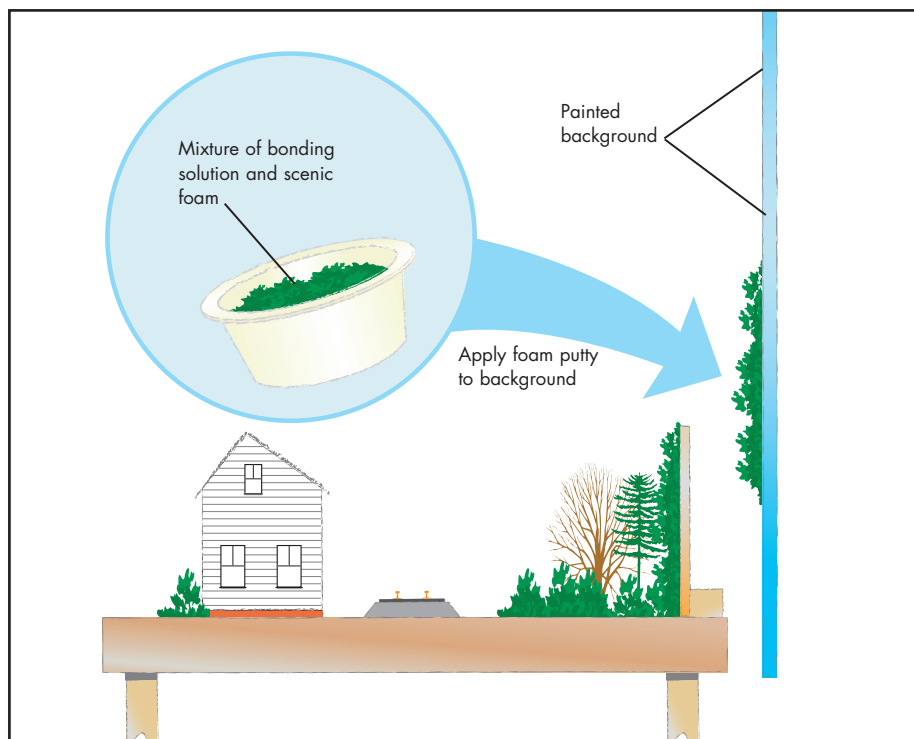
Hold the stencil about 1½" from the backdrop and spray the flat white paint along the cloud top. Be sure to hold the can 12" to 14" from the backdrop and spray lightly!

These first clouds are meant to appear the farthest away; making them light and transparent enhances the sense of distance. Continue adding the distant clouds, using a different stencil for each one, until you get a sky you like.

Next, spray on the clouds that are closer to the front. These should be whiter than the ones behind them, so spray on more paint. Spray a little light gray at the base of each cloud to provide separation and contrast from the next bank of clouds.

Stagger the forward clouds between the peaks of those behind them. It's hard to make a mistake, but if you do, just take the white spray paint and mist over it so it isn't as noticeable.

Keep adding layers. Don't make clouds uniform; they'll look better if placed at random. Remember, you don't have to use all the stencils, the most interesting ones can be used over and over.



Three-dimensional hills sculpted from "foam putty" and applied to the backdrop can help blend the backdrop and the foreground scenery. Make foam putty by mixing bonding solution and scenic foam.

Try to paint all your clouds in one session—then go away. Wait until the next day to evaluate how they look. If some cloud outlines are too hard, soften them a bit with a quick, horizontal spray of flat white.

Mountain stencils

Stencils take the guesswork out of painting mountains, too. To use the stencils, hold them so the mountains extend no more than halfway up the backdrop.

Stipple paint along the stencil edge with a 1½" China-bristle brush, painting in the top edge of the mountain. Then remove the stencil and fill in the area. Feather the left and right edges so you can match a second stencil to the first.

Work your way around the backdrop, changing the stencils as you go. Some of mountains will overlap the clouds; this is okay because it adds to the illusion of distance. Allow the paint to dry.

Using a spray can, gently mist a light dusting of flat white over the most distant mountains. This adds another cloud layer and helps to push the mountains farther away. By now you'll have the hang of painting the mountains, so go ahead and add two closer mountain ranges, using progressively greener colors for each.

Mountains: distance and color

The colors of the mountains are important in conveying the illusion of distance. Paint the most distant mountains first, then work your way toward the front.

Distant mountains should be dark enough to stand out from the blue of the sky but light enough to look miles away. Use a hazy gray-green. After each layer is painted, lightly overspray it with white to



This close-up shows the simple brush strokes required to paint trees on the distant backdrop.



This backdrop was made by cutting structures from printed backdrops, like those sold by Scenic Express and Walthers and gluing them in different arrangements to a painted blue backdrop.

reduce the vibrancy of the color and provide separation for the next layer.

The formulas for mountain colors are listed in the sidebar on page 101. Paint the most distant mountains with a soft bristle brush. They don't have to extend all the way to the bottom of the backdrop because the next layer of hills will cover the bottom edge.

Add a little paint at the ridge line to simulate treetops. Use the tip of the brush in a stippling motion to get a ragged effect. Allow the paint to dry, and overspray with flat white to dull the color.

Mountains in the middle distance should be greener. I like to paint these in between and at various angles to the most distant hills. Again the procedure is the same: Paint on the hills, allow them to dry, and mist with white. Don't use as much white on these hills because we want them to appear closer to the viewer.

The closest mountains should be almost all green: Start with the most distant color and add more green to it. If the color isn't quite bright enough, add a little yellow.

At this distance, individual tree shapes are discernable on the top of the mountain. I use a 1½" China-bristle brush held perpendicular to the backdrop to paint triangle-shaped trees on the tops of the hills. Paint light and shadow on these trees by placing a swatch of yellow-green paint next to the closest green and picking both up on the brush without mixing. The trees will be half yellow-green and half full-strength green.

Three-dimensional hills

I've painted shallow, three-dimensional hills on several layouts to blend the backdrop and foreground scenery. Make a batch of foam putty and apply it with your fingers, pushing it against the

backdrop so that it looks like the tops of tree-covered hills extending down to the scenic shell. After the putty dries, dry-brush the tops of the trees to lighten them.

Printed paper backgrounds

Dozens of good-looking paper backgrounds are available from Scenic Express, Walthers, and other suppliers. These backgrounds depict clouds, cityscapes, rural settings, large factories, hills, and high mountains.

Paper backdrops can be glued to a prepared wallboard or fiberboard base with diluted white glue or wallpaper paste. You can also cut out parts of the scenes and glue them over a prepared blue backdrop. These look best if the buildings, trees, and hills are located so that the shadows are always cast in the same direction.



Rubber stamps purchased in a craft store can be used to add simple tree shapes to your background.



Stickers like these can be found in craft stores and are easily peeled from their backing and stuck directly on the background.



Experimenting with tree-shaped stamps for a backdrop, the author made these green and brown test stampings. They'd look convincing on a properly prepared backdrop over painted trees and hills.



Dave Willis found photo mural wallpaper to use as a background for his O scale layout. The wallpaper extends around the room the layout is in.

Photorealistic backgrounds

Photo murals are another great source of realistic backgrounds. These can be made from your own photos or from reference photos of the area you're modeling.

With the recent developments in digital photography, realistic backdrops can be “built” using multiple photos layered and sandwiched together to make a new and interesting scene.

Rubber-stamp background trees

Here's one of those “why didn't I think of that?” ideas. A friend of mine was in a craft store and saw a selection of rubber stamps depicting various types of trees. These were just crude enough to look good if used in clusters on the backdrop.

I made a stamp pad from paper towels and soaked it with green acrylic paint. After loading the stamp on the pad, I pushed it against the backdrop, and voila—instant trees. With this technique, experimentation is the key to achieving pleasing colors and tree textures.



Joe Galdi used this commercial mountain mural instead of scenery along a narrow aisle on his layout.



Most of your scenery energy should be concentrated on the foreground of your model. That's where people look first. If the foreground is properly detailed, the eye of the viewer will assume that the rest of the layout has the same high degree of detail.

Foreground scenery

My goal has always been to produce scenery with realistic colors, textures, and foliage. I call this “scenery for the broad effect,” and it’s meant to look great when you stand back and view the layout as a whole.

This chapter is about the other side of the coin: highly detailed scenery. We’ll explore the things you can do in the foreground of your layout to further the illusion that your scenery is super-detailed throughout—even though it may not be.

Foreground scenery is everything within 18” of the front edge of the layout. This is where you should spend 80 percent of your scenery building time and effort to add details, more realistic textures, and colors with impact. It’s a bit like a theater set: The level of detail in the foreground establishes the tone for the rest of the layout: If the foreground is highly detailed, the mind’s eye of the viewer assumes the same degree of detail in the background.

Scene composition

Treating foreground scenery as a group of separate scenes will expand the perceived size of the layout. Each scene should be separated from other parts of the railroad by natural or manmade boundaries: hills, rows of trees, roads, fences, tracks, and so forth.

The boundaries serve as bookends to keep viewers focused on the scene and to prevent their attention from wandering. You want them to fully absorb the impact and details of each scene before they move on to the next. So how do we achieve this?

First, you have to decide what will be the theme of the scene. For example, it might be an industrial siding with a well-built structure, clusters of details, and realistic weathering, all surrounded by detailed foliage. This element sets the boundaries of your scene and helps you decide how to compose it and what to include in it.

You can make a scene more believable through well-considered composition—the way the structures and scenic elements are arranged. One simple trick is to make the scenery rise slightly as it extends back from the front of the layout. Viewers won't notice the slight slope, but the rise will break up the flat tabletop look.

Sloping terrain expands the space in the scene, because at eye level a viewer can see more of what's in it. Careful placement of structures on the slope will make the scene more believable. Set the structures in place and then move them around to find the best locations.

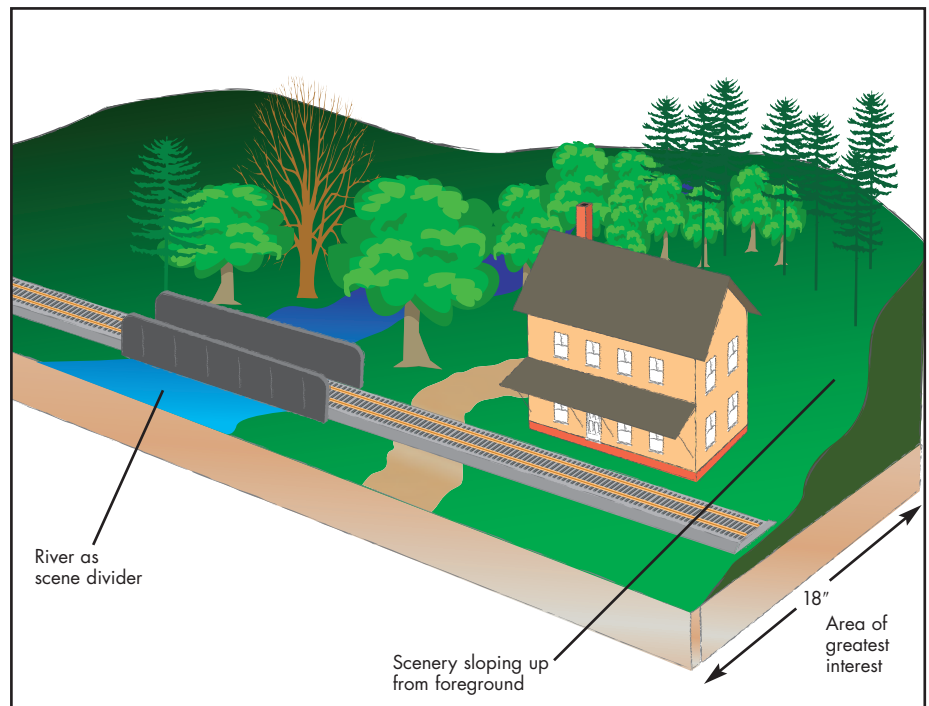
Begin by trying all the conventional locations for structures: parallel to the track and at right angles to the edge of the layout. Boring? Then try something unconventional; shift them to spots where a building would “never” be placed. For example, make the backs of buildings face the front of the layout or the track. Try elevating a building on small blocks of wood to simulate a high foundation.

You are looking for an exciting arrangement that also makes sense. After several tries, the scene will “click.” The buildings will look right, and your foreground will come alive.

Don't anchor the structures down just yet. Leave them in place for several days



The foreground is the part of your layout where you should go all-out with a great variety of different scenic textures, colors, and details. Carl Chancey layout



You can make a scene more believable by thinking about how structures and scenic elements will be arranged. Remember that the area of greatest interest for the viewer is going to be the front 18" of the layout.

and come back. If the scene still looks right and the arrangement seems pleasing, try moving the structures apart. If the composition is strong, adding extra space between the individual elements won't destroy the effect; if the arrangement is weak, the extra space will

make the weakness more obvious.

Now check out the spaces between and around the buildings. Can you tell why the buildings are there and what they're supposed to be doing? Do the buildings need a lot of supporting detail to tell your visitor what's happening?

- Awnings
- Conduit and electrical meters
- Cornfields
- Lightning rods
- Outdoor thermometer
- Rose trellis
- Shutters
- Slate roof
- Weather vane with animal figure on top
- White picket fence
- Window boxes with flowers
- Window screens
- Woodpiles

- Copper flashing around on chimneys
- Cornice returns (New England structures built before 1940)
- Fire hydrants
- Flagpoles
- Heating-oil tank
- Outside covered stairway
- Pulp piles
- Signs
- Telephone poles with transformers
- Tin roof

- Abandoned boats in the mud
- Blacksmithing/welding
- Boat-launching ramp
- Fish-drying racks
- Fish tubs
- Fisherman's shacks
- Gas pumps on the dock
- Lifeboat
- Life preservers
- Lighthouse
- Net reels
- Pigeons
- Piles of lobster pots
- Seagulls
- Track scale for weighing fish



Spots of vivid color make an otherwise drab scene more interesting. Here, Woodland Scenics flowers were sprinkled over stretched Poly Fiber.

If you need those props, try to position large detail items where they'd normally be found. Now, check the overall scene and make sure it still looks right. The buildings should still fit, and the details add to the effect. If all the elements work together, visitors will "get it," and no explanation or captioning will be required.

Foreground scenes with buildings are "active" areas. Well-planned, active areas will make viewers stop and spend time looking at the scene.

If you plan multiple active areas for the foreground of your layout, the challenge will be making them different from each other. One important way to combat sameness is to make sure you don't have anything parallel to the edge

of the layout or aligned with other active areas. Mainline tracks and passing sidings have to be parallel or pretty close to it, but buildings and other features along the track shouldn't line up with the edge of the layout, the track, or each other.

Spaces between active scenes, the scene dividers or "bookends," are transition areas that should provide buffer zones between active areas. Transition areas should be passive—without eye-catching detail. A transition area can be a clump of trees, a hill, a plowed field, a hedgerow, rock piles, or any realistic continuation of the scene.

The way you compose a scene will direct what your visitors see. Just as a painter arranges a canvas into shapes and areas of color to direct the eye, we can use leading lines and colors in active foreground areas to guide visitors through the scene.

Leading lines are natural paths that the eye uses to scan a scene. On a model railroad, the track most often does this, but we can supplement it with roads, telephone poles, waterways, and fences.

Roads or waterways extending from the front edge of the layout also create strong leading lines. If they stay inside the active area, so will viewers' attention. The eye will almost automatically follow a fence or road that leads from a large

building to another building. Similarly, when a road, stream, or brook connects one area to another, viewers will follow it, moving quickly from scene to scene.

Gentle S curves in a scene lead viewers along the curve and break up space in a pleasing manner. They also have the advantage of making a scene seem larger than it is. For the best effect, S curves should not be parallel to the track or the edge of the railroad, though in a flat scene, the track itself may be the S curve that breaks up the area.

Fences in the foreground make excellent leading lines to direct viewers from the edge of the layout to the center of a scene. Use them to point out your favorite scratchbuilt building or to separate one active area from another one.

Fences radiating from a central point separate an area into slices that make the total area look larger than it is. Long fences built in perspective (large in the foreground, smaller toward the background) produce the effect of great distance in a small area. Where space is limited, use short sections of fence to suggest a complete fence or enclosure. A board fence can be used on a narrow shelf railroad to hide the line where the rear edge of the shelf meets the backdrop.

Color as a leading element

Another way to control how a viewer's eye travels through a scene is with a color triangle—the judicious application of bright color. If you place the same bright color in three places in a scene, the viewer will be led from the closest, to the next, and then to the farthest. A simple example is three figures, each with a red shirt. Any brightly colored objects will work: oil drums, advertising signs, even scraps of new lumber.

Try this trick: Determine three areas in a scene where you want a visitor's eye to go. This progression could involve moving from a foreground loading dock to a small junk pile, on to an outhouse at the back of the scene.

Make three small bushes from sprigs of Scenic Express Super Trees or other low bushes, spray them with matte medium, and sprinkle on bright red or orange scenic foam. When the bushes are dry, place one of them at or near each of the three spots you've chosen.



Sometimes simpler is better. This quiet scene in a corner of Carl Chancey's O gauge layout provides visual interest and enhances the layout's realism, but it doesn't compete with the trains as the center of interest.



A lighted Christmas tree adds interest to this scene. The tree is built on a 1/4" phone plug so it can be removed in the off-season and replaced with a regular pine tree. Alan Rieper layout

Now, ask some friends or family members to look at the scene. Stand back and watch where people look. They'll start with the bright foreground bush, then move through the scene from left to right and front to back.

Items with similar shapes can work the same trick. Repeated shapes combined with bright colors will cause the viewer's eye to jump from one to another like magic.



Sometimes all you need to do to build an effective scene is to duplicate a prototype. Here's the state line marker on Dick Rotto's layout. The rocks were colored to match the prototype.



The road in this scene is the leading line that guides the eyes of viewers into the signal tower scene. Carl Chancey layout



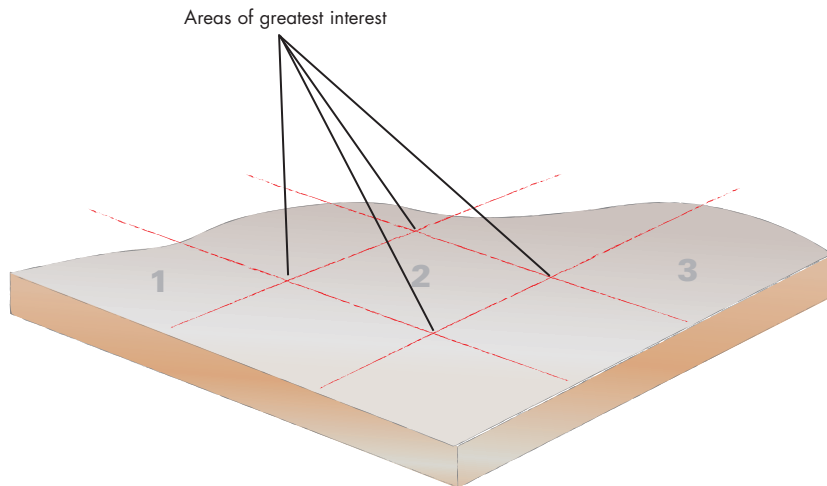
The author created this boat-building shop to add visual interest to the foreground of a layout. He placed the back of a small factory building toward the water and added several small boats and a dock made with wood scraps left over from other projects.

THE RULE OF THIRDS

If there's no obvious center of interest in your active area, you can always fall back on the rule of thirds. The rule of thirds keeps you from placing a structure or another center of interest dead in the center of a scene, which would make it static and dull.

Mentally divide the scene into thirds, working from north to south and east to west. This will break the scene into nine squares. The four points where the dividing lines cross are the natural centers of interest. Select one point for the largest element in the scene and choose another for a smaller structure or cluster of detail. The smaller center of interest will balance the larger one.

Use a leading line, such as a road or fence, to lead the viewer from the main center of interest to the secondary one.



For an active area that doesn't have an obvious center, divide the scene into thirds, north to south and east to west. Locate the main element of your scene on one of the four points where the lines cross.



The author built this junkyard from many different items. The multitude of detail items creates an area of interest in the foreground (note the puddle in the road). Carl Chancey layout

Get the right balance

It's easy to add too much detail to a scene. If we painted a picture of an active area on a model railroad layout, an art critic might say the picture was too busy. As each foreground scene nears completion, evaluate to determine how much content is enough.

We don't want our carefully crafted scene to look like a jumbled mess of bits and pieces. Strike a balance between austere scenes that are short on detail and interest, and scenes that are so busy viewers feel overwhelmed and don't know where to look. Details grouped in clusters will make the scene less busy than if the same amount of detail were spread evenly over the area.

The correct balance is a busy scene, but one that won't confuse viewers. I want them to see all the detail while they move slowly along the leading lines to the center of interest.

You don't have to wait until all of your scenery is finished before building an active foreground area. Completing



This area at the front of Joe Galdi's HO layout is being prepared to have a coal tippie installed. Forced perspective was used on the road as it winds and disappears in the woods. The farmhouse is N scale to enhance the near/far illusion.



Sculptamold is easy to shape or carve into almost any type of scenic formation. It has been sculpted here to look like desert soil eroded by wind and rain.



All the foreground scenery should be painted, even the dirt! Here, the author dry-brushes the tops of the stones by the side of the track with a light earth color.



The author installed a heavy-duty rock formation between two foreground sections of this layout to keep operators and visitors from bumping into and damaging the trees above. Joe Galdi layout

even a small active area will allow you to try all of these techniques on a small scale. It will also give you the thrill of having one part of the layout done. This can be just the inspiration you need to finish the rest of the project.

Close-up scenery techniques

When working on the foreground, you have to think and work on a slightly different scale than you did while building background scenery. Everything in the foreground should be built for the best possible effect. Each scene is important, and all the elements have to be individual models in their own right.

For starters, add extra texture to the soil; nothing makes a scene more boring than flat, uniform soil. Turn a rock mold inside out and press the textured side into damp Sculptamold to create a rough, angular texture on an otherwise bare surface.

Another way to make a rough surface is to gently jab a large, stiff-bristled paintbrush into damp Sculptamold. This will yield a pebble-like texture. For the look of hard-packed earth, rub Sculptamold with a wet sponge to level and smooth it.

Foreground colors

Vary soil, grass, and foliage colors to enhance the impression that the foreground is complex and, therefore, interesting. This will help keep a viewer's eye in the scene.

Everything in the foreground should be painted. I use thin acrylic raw sienna and raw umber washes, as well as our basic black wash applied over the basic earth color.

Test each wash on scrap or on an out-of-the-way corner of the scenery to check its color. Always evaluate color after it has dried; if necessary, you can hasten drying with a hair dryer or heat gun. Like rocks (see Chapter 4), bare earth looks best when lightly dry-brushed with light earth color after the washes dry.

A good starting wash is $\frac{1}{8}$ "-long blob of raw umber or raw sienna tube acrylic mixed with 2 ounces (about $\frac{1}{4}$ cup) of earth color or wet water. For better control when mixing colors, always add the dark to the light color. You'll see immediately if the wash is too dark.



If you need an access hatch in the foreground, one way to build it is to use a polyurethane rock section. Here it is in place. Joe Galdi layout

Be sure to mix thoroughly because tube colors tend to clump at the bottom of the container. Always mix a little extra wash so you can do touchups later or repeat the results in other scenes. Label everything so you can match colors later on. Apply the black wash directly from the bottle or thin it with water or alcohol.

Foliage texture and detail

After coloring bare ground, add texture materials. These can be sprinkled into the wet paint or applied after the paint has dried, using the methods described in Chapter 5.

Work in an area about a foot square so you can apply many different textures. For the first layer, use the color mixture you've used for the rest of the scenery so the overall colors will match. Add sifted soil, gravel, other colors and textures of scenic foam, clusters of painted details, stone walls, pieces of wood, branches, and logs.



Here's the same area with the rock piece removed. Strips of Velcro hold the piece in place but make it easily removable. The red plastic strips assure that a derailed train won't fall to the floor. Joe Galdi layout

As with other foreground details, foliage has to be constructed with extra care. For example, while the weeds on the rest of the layout can be simple tufts of coarse foam or bits of foam-covered lichen, foreground weeds should be clumps of Silflor, tiny twigs, or Poly Fiber covered with fine ground foam.

Even surface rocks (like those left from the Ice Age) become an interesting exercise in detailing. Make large rocks and boulders from Sculptamold mixed to a clay-like consistency. Shape blobs of this material into boulder shapes with your fingers and then add surface detail by pressing an inverted rock mold

against them. Carve cracks in them with a hobby knife.

Paint these rocks, using the same techniques described in Chapter 4. Since they'll be viewed close up, vary the color of the rocks with a little basic black wash. After it dries, flow a weak wash of green over the "north" face, allowing it to run into the cracks and crevices. The green will give the illusion of moss growing on the rocks.

Finish the rocks by dry-brushing top surfaces to bring out the texture. You can also lightly coat the rocks with a fine earth or rock powder to give them a dusty look. Glue small pieces of scenic

foam to the top and sides to represent larger clumps of moss and lichen.

Structures as scenery

Like props on a stage set, buildings are a vital part of your countryside. Without buildings, your layout would be empty and dull.

After the trains, structures are the elements of your layout that your visitors will notice most. Extra time you spend blending structures with their surroundings will reward you tenfold. They'll no longer be just models but integral parts of the scene. That's why I always try to establish the size and shape of structures at the same time I plan the scenery. The idea is to plant foreground structures in the scenery so they look as though they belong there.

Blending structures realistically into your scenery isn't difficult. I prefer not to anchor structures to the layout; if one needs repairs, it's easier to take it to the workbench than to try to repair it in place. I mount each structure on its own piece of 1/4"-thick foamcore board after it has been painted and weathered.

On some models, the foamcore will be the same size as the base of the structure; on others, you'll want extra room for related elements. Measure and cut the foamcore slab and paint it with earth paint. Place the structure on the foamcore and trace its outline, marking where you want surrounding elements such as walks, grass plots, sidewalks, shrubs, or parking lots.

Place the base on the layout, level it with cardboard shims, and hot-glue it in place. Feather Sculptamold up to the edge of the base or use clumps of foliage, hedgerows, or fences to hide the joint.

After the Sculptamold sets, paint walks and sidewalks concrete color. Brush white glue where the grass and shrubs will be, and sprinkle on green scenic foam for grass, brown foam near the house for dead leaves. Add strips of Silflor for the shrubbery.

Insert small pins into two corners of the structure to hold it firmly in place on the foamcore base. Push the building onto the pins and finish detailing around it. Add extra items like, for example, barrels on a loading dock, piles of lumber, an automobile in the driveway, people, and junk in the backyard.



Contractor's sand and vermiculite were mixed with the earth paint to add extra texture on the front side of this mountain. The stones were glued in place, and everything was dry-brushed with white.

LIVE SCENERY AREAS

On several train displays I've built, I included foreground scenes called "live scenery areas." These serve as platforms for changing structures, scenery, or even the theme of a layout without having to rip apart and rebuild scenery.

Live scenery areas usually consist of large flat expanses of dirt or black top surrounded by trees but offering little in the way of low foliage. Some scenery is

included, but the area is mostly bare.

Place trees and foliage, painted details, and structures in live areas just as if you were finishing the scene, but don't glue the elements down. When you get tired of the configuration, rearrange the elements or add new ones. Just remember to remove the details before you vacuum the live areas during your regular layout cleaning routine.



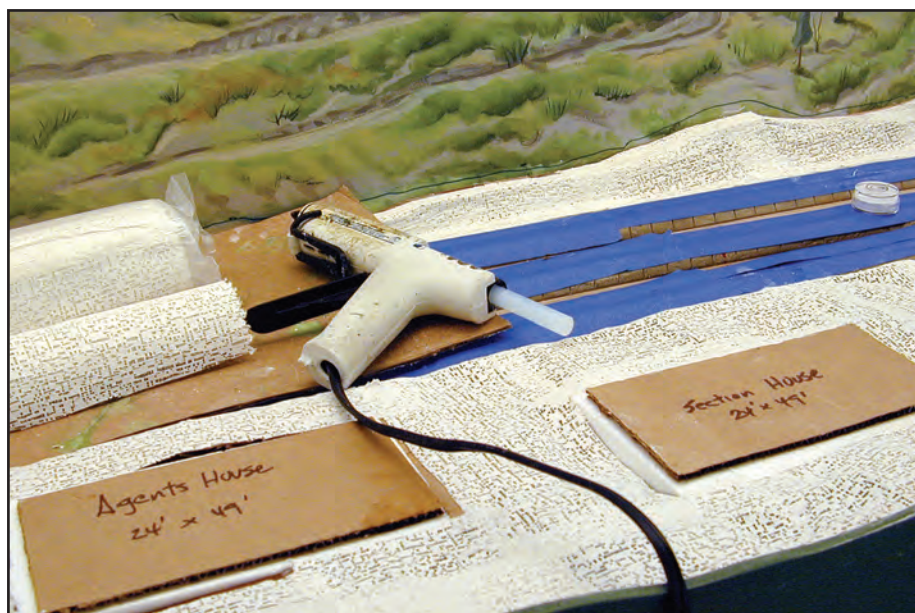
Woodland Scenics Field Grass in several colors was combined with Silflor and Poly Fiber to create this thicket. Carl Chancey layout

Weathering structures

It doesn't matter whether you use scratchbuilt, kit, or preassembled structures, as long as whatever you use is carefully built and realistically colored. I prefer to weather structures before placing them on their foamcore bases, but this step can be done anytime.

For your first weathering effort, try using artist's pastel chalk. Chalk is the easiest medium to master because you can simply wash it away and try again if you don't like the results. I use a Grumbacher Soft Pastels Landscape Assortment. This set contains 30 different chalk sticks, ranging from white to an assortment of earth colors ending at dark brown. Several shades of blue and green pastels are also available.

If you can't find this Grumbacher assortment in an art store, a good



The bases for these foreground structures were leveled and hot-glued in place. Creating a separate base for each structure on your layout assures that it will be firmly anchored to the layout and that the structure will be level. Dick Rotto layout



Far from the front edge of the layout, this structure was meticulously detailed to become a point of interest amid diverging tracks. Carl Chancey layout



Art Fahie sprayed thick gray paint over the road base of this street scene. The paint cracked as it dried, creating the cracked asphalt effect. Art finished the road by airbrushing on a light earth color.

alternative is a set of the chalks sold for kindergarten students. These are 1"-square blocks; I found an assortment in a craft store and selected black, white, brown, and several pastel earth shades. For fun, I also bought two shades of leaf green, plus bright yellow, orange, and violet-red.

For weathering purposes, the chalks must be ground into a fine powder. Rub a chalk stick on coarse sandpaper or a coarse file over a sheet of paper to catch the powder. Roll the paper into a funnel, and dump the powder into a container. I use plastic bags, each labeled to clearly identify the color of the chalk inside.

Apply chalk powder with a soft brush or, on small structures, a cotton swab. I have several brushes that I use just for weathering, including a No. 11 round-tip sable for dusting small areas. For larger jobs, I use an old shaving brush, though a soft makeup brush would also work. I store these brushes with the

chalks to keep them separate from my painting brushes.

Make a chalk weathering mix that's about the same color as the earth on your layout. This mix will allow you to bring dirt and grime from scenery up onto the sides of your structures.

Use a sheet of white paper as a palette to mix chalk colors. Starting with small piles of burnt umber and white, pick up some of each with the tip of your brush and mix them together until you have a light earth color.

Brush chalk powder on the structure to simulate dirt kicked up onto the walls by rain. Use the brush like a shovel to pick up some of the chalk and lightly brush it from the bottom edge up around the base of the structure. Brush this band of dust all around the base.

Smooth the weathered areas of the structure into the non-weathered areas by brushing upward with the shaving brush. You can also try blending the chalk with your finger, but that method is harder to control. You will also be likely to leave fingerprints on the model that way.

Once you have the hang of mixing and applying the chalk, venture onto the walls and roof of the structure. As you weather these areas, think about nature and how water and wind move dirt. The wind blows the dirt onto the upper parts of the structure, and the rain moves it down the sides to the foundation.

Keep your brush strokes vertical to reflect the way gravity moves dirt. Add black or rust powder around chimneys. To set the powder and remove excess chalk, rub it lightly, top to bottom, with a stiff-bristled brush.

After you're comfortable weathering with pastel chalks, try experimenting with pure black chalk. Load the black powder on a brush, and dab it lightly up and under eaves, roof overhangs, windowsills, and any other place where you want to create shadows. This technique works well on foreground rocks, coal piles, and other places you want to look dirty and grubby.

Painting cast details

Thousands of cast resin detail parts are now available in almost every scale. They come both pre-painted and unpainted. Painting and weathering these details



Many detail elements combine to make this scene look realistic. The structure was given a peeling paint treatment, the sign was made on the computer and printed out, the broken windows were made by poking holes in acetate, and details from several kits were carefully painted and weathered.



A whole new type of texture and color can be created by dry-brushing the tops of weeds and grass. Here Silflor is getting a light dry-brushing of Raw Sienna.

yourself can improve their built-in realism and bring your foreground scenes to life.

Prepare unpainted details to receive paint by cleaning them with denatured alcohol to remove dirt and grease. Make a painting base by attaching lengths of blue painter's tape to a piece of cardboard, sticky side up.

Stick the details to the tape and

prime them with light gray or white automotive primer in a spray can. After priming, set the cardboard square aside for several days to let the primer cure thoroughly.

Once dry, the parts can be painted using your favorite hobby paint. Use a magnifier and a small brush to make sure the paint goes only where you want it to. Once the paint dries, flow on the



Pastel chalks are great for adding weathering accents to foreground scenery. The ruts in this plain dirt road were added by applying a light dusting of brown, terra cotta, and black chalk. The chalk was ground into powder on a piece of fine sandpaper.



The author used fine white chalk to create the effect of many years' worth of bird droppings accumulated on the roof of this waterfront structure. Structures can be weathered in place with pastel chalks.



The rust effects on the bell of this harbor channel buoy were added with toffee-colored craft paint. The next step is to weather the buoy with chalk. Paint details like these on the workbench, or paint them in place on the layout, if they are accessible.

basic black wash to enhance shadows. Finish by dry-brushing surface highlights with white.

Details around farms, industries, and rail lines call for extra weathering. Rust spots, oil streaks, peeling paint, and chemical stains add authenticity to a scene. Apply these details with a fine-tipped brush. Leave the parts on the cardboard square for about a week before proceeding, so the paint will dry hard.

Dry-brushing techniques

In Chapter 4, I described how to dry-brush rock surfaces to bring out the maximum detail. I use a finer approach for intricate details in the foreground. Like all weathering effects, this is most realistic when it is almost unnoticeable.

I have dedicated several brushes that I use exclusively to dry-brush details. These range from quite small to 1/2" wide. Round and flat brushes work equally well. I trim the bristles with scissors, straight across, to make a flat end.

The mechanics of dry-brushing details are similar to the process for dry-brushing rocks. Dip the brush into the paint so the tips of the bristles are just barely moistened with paint. Stroke the brush back and forth on a paper towel to remove all but the last traces of color. To test for the right amount of paint, stroke the brush over the palm of your hand. Only the slightest wisp of color should be left on your skin.

Hold the brush perpendicular to the part and, working from the top, gently stroke the brush downward using short, patting motions. Paint should be left only on the top edges of raised detail. No brush marks or streaks should appear. Brush marks indicate a brush that contains too much paint; remove the paint before continuing. Dip a cotton swab in clean water and scrub away the excess paint.

My favorite paints for dry-brushing are titanium white, ivory white, and antique white craft acrylics. Dry-brush large objects with a version of the base color lightened with a little white. When this dries, repeat the process by adding more white to the base color, then finish with almost pure white. Go easy with this technique: It's easy to apply too much paint. You don't want dry-brushed details to look frosted.



Dry-brushing subtly brings out the details on tracks, rocks, and structures. This wall casting was primed with scenery black paint before being dry-brushed with antique white to make the individual stones stand out. Acrylic craft store paints work fine for this application.



Dry-brushing made these stones look loose even though they're glued firmly in place.



Here in the canyon, the aspens are starting to turn to bright yellow and the oaks have turned red.
Joe Galdi layout

Modeling the changing seasons

Most model railroad scenery depicts a summer setting. I guess this is because everyone loves warm weather, cool breezes, and fair skies. To depict this season convincingly, you need only green trees, yellow-green grass, blue water, and a sky-blue backdrop.

But the other three seasons are almost as easy to model, and they bring color, and variety to your scenery and make it more interesting. Autumn, with its bright colors, may be the most beautiful season to model. Winter snow on the higher elevations of your layout will add areas of brightness for surprisingly little extra work. Everything you need to model these seasons is readily available.

On a recent museum project, I had the opportunity to build all four seasons in linear progression around a 90'-long display. When visitors enter the room, they are greeted by the bright green grass, yellow-green leaves, purple buds, and yellow flowering shrubs of spring.

As visitors move around the display, spring evolves into summer, with darker grass and solid green leaves, and then to late summer with dying grass, yellowing aspens, and reddish-brown oak leaves.

Next comes autumn, with straw yellow grass and the leaves ranging in color from yellow to deep red—sometimes all on the same tree. The last 35' of the display are devoted to winter with the browns of dead leaves and bare trees, and snow on everything.

Modeling autumn

Back in Chapter 3, we mixed shades and textures of greens, yellow-greens, and browns to make a basic green blend for summer scenery. For autumn foliage, mix shades and textures of red, yellow, orange, brown, and a pinch of green. The green serves as a counterpoint to the brilliant hues, making them all seem brighter. Bright fall textures are available in hobby and craft shops as well as scenery catalogs.

Start with a blend that's strong on yellow and brown. Mix by eye, taking

Below: Effectively modeling other seasons is easier than it sounds. The trees on this end of this nearly completed museum display were covered with several autumn texture blends. Pine trees were added to break up the sameness of the fall trees.



Spring has sprung here in northern Vermont where bright spring colors intermix with bare winter trees to simulate the way not all vegetation turns green at the same time when spring arrives in the north.



Late summer is transforming itself into an early autumn on top of the mountain in a model recreation of Rutland, Vermont. This display contains about 28,000 puff-ball trees.





Modeling autumn is easy now that Scenic Express and Woodland Scenics offer assortments of brightly colored scenic foam. Here's the Scenic Express Autumn Tones six-pack.



The author uses several fall texture blends, ranging from yellow-green to reddish-brown. This middle-tone blend mixes red, yellow, and brown scenic foam with light brown sawdust.

a handful of this color, a little of that color, and so on, until you get a mixture that says "fall" to you. Put it all in a plastic grocery sack. This is your basic fall color mixture.

Now, make a second blend by taking a large handful of the first mix and adding orange, a lot of red, and a little brown. The color should still be close to the basic mixture but distinctly redder. You may want to make a third fall mixture by adding more orange and brown to a handful of the second mixture.

Use the texture-over-texture and tree-making techniques described in Chapters 5 and 6, but substitute autumn blends for green. Don't forget to add bare trees made from sagebrush twigs, dried weeds, or cast armatures, with lots of brown and yellow leaves scattered on the ground around them.

Fall grass and weeds

Anything but dull, nature shows us a wide variety of dead and dying grass colors. These range from bright straw-yellow through yellow-brown to dead, grayish-yellow. The most pronounced color is a straw-gold found in meadows, at higher elevations, and often along railroad lines.

Dead grass is easily modeled with Silflor, Woodland Scenics Foliage Fiber, or Heki Wild Grass Fiber. It can also be made from fake fur (see Chapter 3).

Below: Here's what visitors see as they round the corner from fall to winter in the author's museum layout. The ski slopes are scaled-down versions of the Pico and Killington ski areas in Vermont.



Apply brown and light green foam liberally to represent fallen leaves and moss on rocks. In this spring scene, the rocks were sprayed with hair spray and the colored foam was sprinkled on.





This side of the museum display contains 40' of winter. The mountains were built with sprayed foam sealed with drywall spackle and covered with acrylic snow. Most of the background trees are made from white pillow stuffing.

Modeling winter

Modeling a winter scene presents several challenges. The first is simulating snow. How do we create a white surface that looks like sparkling snow but is also easy to apply and clean, will stay put, and won't yellow?

I've tried most of the granulated materials available: plaster (both wet and dry), flour, cornstarch, talcum powder, salt, sugar, and baking soda. They all have drawbacks. Some are too coarse, others can't be glued on vertical surfaces, and a few are dangerous to breathe. None of these are suitable for permanent scenes, except maybe plaster, which is messy and difficult to apply.

After much experimentation, I came up with a simulated snow that can be painted on and is permanent. It stays white and flexible, and it can be cleaned with a vacuum cleaner or damp cloth. I call it "snow goop," and I'll explain how to make it in the next section.

Winter scenes require careful planning in advance. You can't build snow on an already-scenicked layout because the existing colors—especially the greens—will show through the snow.

Start with a white surface. This means removing all texture and painting the scenic shell with full-strength white latex paint. For new scenery, build to the Sculptamold stage, paint the rocks, and leave the rest white. If you want only a thin snow cover, add earth color and a little fine dirt texture for bare patches.

ACRYLIC ICE AND SNOW FORMULAS

Acrylic snow ("snow goop")

- 1 part acrylic gloss medium
- 1 part titanium white paint
- 1 part acrylic modeling gel
- $\frac{1}{20}$ part cerulean blue paint (enough to make the snow "whiter")

Add a small amount of water to make a loose mixture the consistency of mayonnaise. Mix and store in an airtight jar or tub.

Crystalline ice

- 3 parts fine craft-store sparkles
- 3 parts acrylic gloss medium
- 1 part titanium white
- $\frac{1}{20}$ part cerulean blue

Add a little water if the mixture is too stiff.

Pond ice

- 1 part titanium white
- 1 part acrylic gloss medium
- $\frac{1}{20}$ part cerulean blue

Apply on top of a base made from a sheet of Plexiglas.

Winter puddles

Use any of the following:

- Acrylic gloss medium
- Clear gloss acrylic varnish
- 5-minute epoxy
- Super glue (cyanoacrylate adhesive)

Background snow (on backdrop)

- 20 parts titanium white
- 1 part black
- $\frac{1}{20}$ part cerulean blue

Foreground snow

- 40 parts titanium white
- 1 part black
- $\frac{1}{20}$ part cerulean blue

Snow-covered deciduous trees

- 12 parts titanium white
- 2 parts burnt sienna
- 1 part black

Snow-covered pine trees

- 6 parts background snow color
- 1 part medium green
- 1 part Burnt Umber



Brush the acrylic snow mixture over the prepared scenic base. The snow will take about a day to set and dry. The rocks here were first misted with gloss white and then dry-brushed with a little snow.

Acrylic snow goop

My special snow goop is made from equal parts of acrylic gloss medium, titanium white acrylic tube color, and acrylic modeling gel. Add a drop or two of cerulean blue to the mixture to brighten the white. Stir everything thoroughly, and store it in an airtight container. The mixture should be the consistency of mayonnaise; depending on the brand (or brands) of acrylics used, you may have to add a little water.

Snow goop can be painted on or troweled over any scenery base. It produces a hard, glossy, white surface that is flexible and easy to clean. To create the effect of sun glinting off newly fallen snow, sprinkle plastic sparkles (available at craft and sewing

Below: The ski lodge in the foreground is a plastic kit modified to fit the space. The snow on the roof was made by troweling on acrylic snow goop like icing on a cake.



supply stores) onto the goop before it dries. Get the smallest sparkles you can find—the smaller, the better.

Easily troweled on, the snow goop is just the ticket for modeling snow drifts, snow against fences, and snow piled on roofs or sticking to the sides of buildings. Use a palette knife to shape the material into snowbanks, plowed snow, or freshly shoveled snow.

Make sure the snow is carefully applied around the tracks. Brush the mixture over the ties and then clean the rail tops and flangeways immediately.

After the goop is in place and shaped, smooth it by spraying the surface with wet water and manipulating it with a foam brush, palette knife, or wooden craft stick. You can also smooth the surface with the air stream from an airbrush hose. Move the hose in a circular pattern; the force of the air will also remove bubbles trapped near the surface of the goop.

The surface of the wet goop will soon develop a skin and set overnight, then dry completely in about three days with minimal shrinkage. Don't touch it while it dries; you'll ruin the smooth surface.

Snow on structures

The acrylic snow formula can also be used to model snow on buildings. First, dilute the goop with a few drops of water, then paint the mix on all of the structure's raised surfaces with a small brush. Make large snow piles with Sculptamold, then paint on the snow.

Trowel the snow on roofs like frosting on a cake; shape it so that some of the snow hangs over the edge. Remember that real snow melts quickly in warm areas around chimneys and stovepipes. Brush titanium white straight from the tube on windowsills, door ledges, and other surfaces where blowing snow accumulates.

Winter trees

Another winter modeling challenge is building convincing leafless trees. Suitable material from your backyard is hard to find because the branch structures of most small plants are not fine enough to make convincing bare trees. I've had the best results with SuperTrees, dried weeds, sumac tips, and sagebrush twigs.



For distant background trees, stretch white pillow stuffing thin and spray-paint it with black and brown automotive primer. After the paint dries, remove small balls of the stuffing and glue them to the snow base.

HOW TO MAKE ICICLES

Icicles hanging from structure eaves, gutters, signs, spouts, rocks, and tree branches are an effective yet seldom-modeled addition to a winter scene.

Clear nylon toothbrush bristles make excellent icicles. Cut them to random lengths, pick up individual bristles with tweezers, and dip the tips in gloss medium. Using the gloss medium as glue, place each icicle against the underside of a building overhang. Work the blob of medium with a small brush, making sure each icicle hangs straight down.

After the icicles dry, brush on more gloss medium to achieve the characteristic long, tapered shape. If you want, flow a little gloss medium into gutters, around chimneys and down the side of the building to represent ice formed when snow thaws from heat emitted by the building or the sun then refreezes at night.

To mass-produce icicles, spread acrylic gloss gel or Woodland Scenics Water Effects on a Teflon-coated surface or a

plastic sandwich bag taped to a flat surface. Dribble the gel back and forth to form long thin ribbons.

After the gel dries, carefully peel it off and cut wedge-shaped icicles with a sharp hobby knife. Glue the icicles to the model with gloss gel or Woodland Scenics Water Effects, and coat with gloss medium just like the toothbrush bristle icicles.

On layouts depicting the steam era, you can create dramatic ice effects on the sides of wooden railroad water tanks. Water seeps between the tank staves on winter nights and freezes when it hits the cold air. Repeated seepage and freezing results in a large buildup of ice.

Model this detail by brushing ice mixture down the side of the tank. Minerals in the water can tint the ice in a rainbow of spectacular colors, which you can model by adding small amounts of tube acrylic colors to the ice mixture. Build up the ice layer by layer, until you have the desired colors and thickness.



In this finished scene, pillow stuffing is mixed with SuperTrees and small green pines. Everything was given a dusting of gloss white spray paint to make it look frosty.

To add snow to winter trees, stand them upright in a block of Styrofoam and brush the basic snow mixture onto the tops of the larger branches. After it dries, spray the entire tree sparingly with gloss white paint, from the top down. A little white will go a long way, so don't create a solid white tree.

Gloss white spray paint can also be used for snow on pine trees. Spray from the top down and add some sparkles while the paint is still wet—but not too much. You don't want to make those crusty-looking Christmas fir trees you see in gift stores!

Winter background trees

If you've ever studied a ridge line or mountaintop in the winter, you've seen the bare tops of hundreds of trees. I once tried to model these with SuperTrees and twigs, but the branches were too coarse to look real. I needed something finer.

The material I finally came up with is white polyester pillow stuffing from a fabric store. Stretch the stuffing to make a large flat sheet and spray it lightly with

black, brown, and gray paint. Do this outdoors and wear a respirator.

After the paint dries, cut off strips and glue them to the ridge line with white glue. When they're firmly attached, pull at the top of the fiber to lengthen and separate it. By stretching it, you can get a thin, wispy top that looks like distant winter trees.

Winter backdrops

Painting a winter backdrop is another challenge because you have to create vast expanses of white snow dotted with bare deciduous and snow-covered pines.

Mix the background snow base color from 20 parts titanium white, 1 part black, and $\frac{1}{10}$ part cerulean blue. More blue can be added in the shadows or if you're modeling higher mountains.

Add more white to the snow color for closer snow-covered hills. Paint the hills using the technique described in "Mountains: dimension and color" in Chapter 8. After the hill colors dry, add deciduous trees.

Start by masking the top edges of the

mountains and ridge with blue painter's tape. For the tree color use the background snow color with a little burnt sienna added. Pick up a little paint on the tip of a dry 1" brush (the more ragged the better) and wipe most of it away on a paper towel.

Using the top edge of the tape as a guide, gently stab the brush into the background. The trees should have a see-through quality. Paint the trees along the tape, then go back over the ones already painted to make a thicker forest.

To highlight the treetops, mix a little more white into the bare-tree color and lightly dab it on. Mist the completed backdrop with flat white to soften and blend the colors. Allow the paint to dry.

For pine trees, mask only the areas where the trees will be behind the hills. (For pines in front of the hills, no masking is needed.) Start with the background snow color and add green and burnt umber to make the color for the most distant pine color. As you mix, check the color frequently on a scrap of white cardboard.



Even though this snow-covered mountain peak is only about 3' from the foreground, it looks far away.
Joe Galdi layout

Dab in rough tree shapes, with the bottoms of the trees just touching the top edge of the tape, then remove the tape and repeat the process. Add more green to the color as you move closer to the foreground.

Winter lighting

To show them to their best advantage, winter scenes must be illuminated differently from the rest of the layout. Use a flat, white light source that doesn't cause shadows. A two-tube fluorescent fixture covered with a frosted plastic diffuser is a good start.

Add a small blue floodlight (sold in hardware stores for decorative illumination) 6' to 8' from the scene to cast blue light into the shadows. Move the blue floodlight until there's just a hint of blue in the shadows. You may have to fashion simple light baffles from sheet aluminum so the blue light falls only on the snow scene.

HOW TO MAKE ICE

To make crystalline ice, mix the following:

- 3 parts fine craft-store sparkles
- 3 parts gloss medium
- 1 part Titanium White
- $\frac{1}{20}$ part cerulean blue (only a tiny bit—the ice shouldn't look blue)

Add a little water if the mixture is too stiff. Brush this mixture along the edges of waterways and around boulders and banks—anywhere that ice forms by rising and falling water or by continuous freezing and thawing.

For a smooth ice surface on a pond or lake, try mixing one part titanium white, one part gloss medium, and $\frac{1}{20}$ part cerulean blue (just enough blue to boost the white color and add a slight blueish tint). Brush this mixture onto any smooth surface; a sheet of Plexiglas makes a great ice base. Use a very soft brush to avoid brush marks.

For wind-blown ice, where the surface has thawed and frozen several times, apply the ice mix using a stiff brush and a stippling motion.

For ice oozing from cracks in rock faces, flow Woodland Scenics Water Effects downward to suggest a waterfall. After the Water Effects dries clear (it may take several days), coat the surface with the pond ice mixture. You may want to add extra blue or green to the ice to show the mineral content of the ice.

After the ice effects have dried, coat the surface with high-gloss acrylic varnish to protect the ice and keep it shiny.

Make puddles in the scenery and on rooftops with acrylic gloss medium, acrylic gloss varnish, 5-minute epoxy, or even small squirts of super glue—any liquid that dries glossy without a ridge around the edge. Brush crystalline ice mixture around the edge of the puddle to show the effects of freezing and thawing.



Realistic track is easy to duplicate even with flex track. Here George Sellios has ballasted and weathered the track on his Franklin & South Manchester layout so that it blends into the scenery.

Ballasting track

After you've completed the realistic scenery on your model railroad, it's time ballast and detail the track. Although not technically part of the scenery, the ballast around track needs to be laid with the same care and detail you've put into the rest of the railroad. If you want a realistic-looking layout, you need properly weathered ballasted track, so we're going to discuss it here. You'll know you've done it right when the track blends in and becomes a natural part of the scene.

Regardless of the gauge of your track, you must have your trains running perfectly before you even think about ballasting. The real test for perfect track is to run five or more cars backwards around the layout at a fast clip. If all the cars stay on the track, time after time, then it's time to ballast. If not, mark each spot where the cars derail or wobble and fix the problems. The problem is not always the track, so be sure to check the gauge of all your wheel sets. You'll be surprised how many are out of gauge right from the box.

Weathering rail and ties

All visible track on your layout should be painted and weathered. I used to mask the switch points with blue painters tape and spray the track with Floquil Rail Brown enamel. It's a good starting color that's about the right shade for rusty rail. Nowadays, I use Apple Barrel brand or other craft-store acrylics thinned with a little matte medium and water.

There's no exact formula for the rail color. Squirt about $\frac{1}{4}$ cup of burnt umber paint into a paper cup, add about 2 tablespoons of matte medium, and about 2 tablespoons of wet water. Mix the ingredients together and brush the paint onto the ties and rails, keeping it away from switch points and linkages. Do about a 2' section at a time. Wipe the rail top clean immediately with a soft cloth. You may have to go back and clean the top of the rail more with a Bright Boy or other commercial rail cleaner after the paint dries.

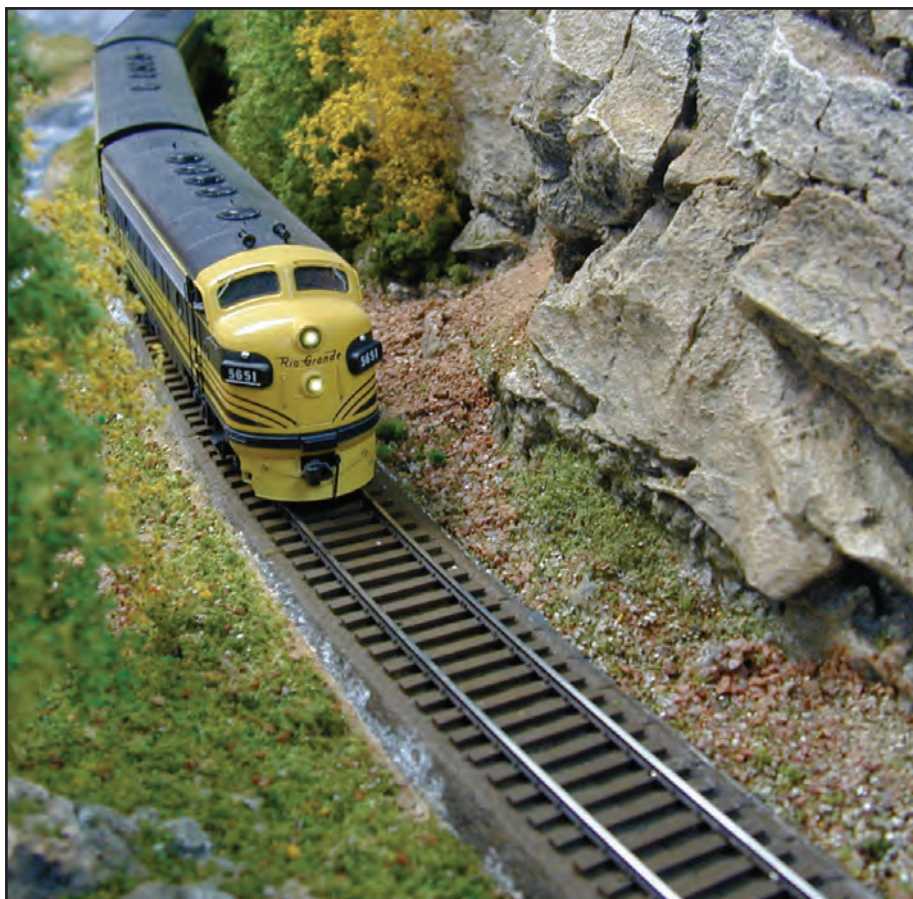
For extra protection to make sure the paint does not foul the switches, put a drop of plastic-compatible oil on the points and linkages. The oil keeps the water-based paint away. If you do get paint in any of these areas, flow clean water into the paint and wick it away with a paper towel.

After the paint dries, dry-brush the ties with white made by mixing titanium white with a little Burnt Umber. The proportions are not critical, as long as the dry-brush color is much lighter than the base color. After dry-brushing, you may want to randomly paint individual ties with gray (5 parts titanium white to 1 part black) to look like old, weather-beaten wood.

Ballasting track

Always ballast track after the scenery is complete. You want the ballast to overlap the dirt and grass along the right-of-way and look like it was laid after Mother Nature and the road-grading crew created the surrounding terrain.

For the best results, use only real stone ballast—I can't stress this enough! If you're in doubt about the product you purchased, drop a pinch of it in a cup of water. If any of the "stones" float, the ballast is made from an organic



Ballasting the track is all that's left to do on this layout. Ballasting is best done last, after all the scenery is in place, so you can make sure the ballast flows realistically over the roadbed and onto the surrounding scenery, just like on full-sized railroads. Joe Galdi layout



The author dispenses ballast from a paper cup. He's laying ballast made from aquarium stones, available at any pet-supply store, on this O gauge layout.



Use a piece of foam packing cut to the width of the rails to spread ballast. The foam will clear excess ballast off the tops of the ties.



Use a wider piece of foam to finish pushing the ballast off the ties. Several light passes may be needed to clear all of the small stones.



After the ballast is spread, soak it with wet water and apply the matte medium bonding spray. Use enough spray to soak the ballast so that a little excess runs out into the surrounding scenery.



Weather ballast by brushing on a dark wash. Apply a coat, allow it to dry, and evaluate the color. If it's not dark enough, apply more wash and repeat the cycle until you get the color you want.

material, such as crushed nutshells, not rock, and it won't "sit" correctly.

Real stone ballast is heavier and won't float. When you use it between the ties, it will stay where you put it. Also, when you flow matte medium bonding solution into the ballast, it will settle in around the stones to give you neat results requiring little clean-up.

A good rule of thumb is to always choose stone one size smaller than you think you need. If your layout is HO, choose N scale ballast. On large-scale layouts, I've even had good results with aquarium gravel and parakeet cage grit.

The ballast bonding solution is 1 part white glue diluted with 3 parts water. Add a few drops of dishwashing detergent as a wetting agent to make the mixture flow better. Matte medium can also be used as a ballast cement, but it's not as strong. You may need two liberal applications to get a good bond.

Pour a thin layer of ballast over the track. I put the ballast in a paper cup and squeeze one side of the rim to make a V-shaped lip. Pour a thin line of ballast down the center of the track and outside each rail, and spread it with a piece of foam rubber. I use the material that brass and plastic locomotives come packed in. Cut a strip of foam so it's just tall enough for you to grasp and wide enough to fit between the rails.

Insert the foam strip between the rails and run it down the track. It'll smooth the ballast between the rails and ties and push excess ballast ahead of it. After you smooth a 2' section, turn the foam strip sideways and smooth the tops of the ties outside the rails. Add more ballast to thin spots. Remove excess ballast with a spoon or push it ahead to the next areas that needs ballasting.

Do not spread any ballast around the moving parts of turnouts; the stones will act like a wick and draw the bonding solution into the linkage.

Now, using a small brush, push stones off the ties and fix areas that need more smoothing. Remember that the stones should be between the rails, not up on the ties or in the flangeways of the rails. Use the tip of a hobby knife to remove stones from flangeways and switch points.

Take your time with this; once the bonding solution is applied, the stones

will stay put, so get them where they need to be. When a track section is ballasted to your liking, mist the track and ballast with wet water. Keep adding water until it starts to run out from under the ballast.

Now use an eyedropper to apply the bonding solution. Flood the ballast with solution so it runs out onto the surrounding scenery. Wick away excess solution with paper towels.

After a section is completed, don't touch anything. Continue on the next section of track. If you see a spot that needs fixing, do it after the glue dries. Let the ballast dry overnight.

You may find that the edge of the ballast, the part that slopes off into the scenery, needs more coverage. Brush on full-strength white glue and sprinkle ballast into it with your fingers. After letting everything dry, vacuum the track to remove loose ballast grains.

Weathering ballast

After the ballast dries, it may look a little too bright, especially if you are modeling a branch-line railroad. To tone it down, mix 1 part acrylic earth paint with 5 parts water and flow this thin wash between the rails. It will spread out into the ballast and, when dry, will give the ballast a dusty appearance. (Use this same wash on grass texture to simulate dead grass.) Wipe the railheads with a damp cloth to remove any traces of paint.

On the outside of the rails, apply a rust wash of 1 part acrylic raw sienna with 8 parts water to the ties and ballast.

To simulate grease and oil stains, flood the area between the rails with a black wash of 1 part flat black acrylic paint mixed with 10 parts water. The wash will spread out under the rail to the edge of the ballast. The more wash you apply, the darker and the ballast will become.

When all the paint has dried, dry-brush the ties and ballast with titanium white to accent them. This dry brushing will give the track a detailed look even if it's not.

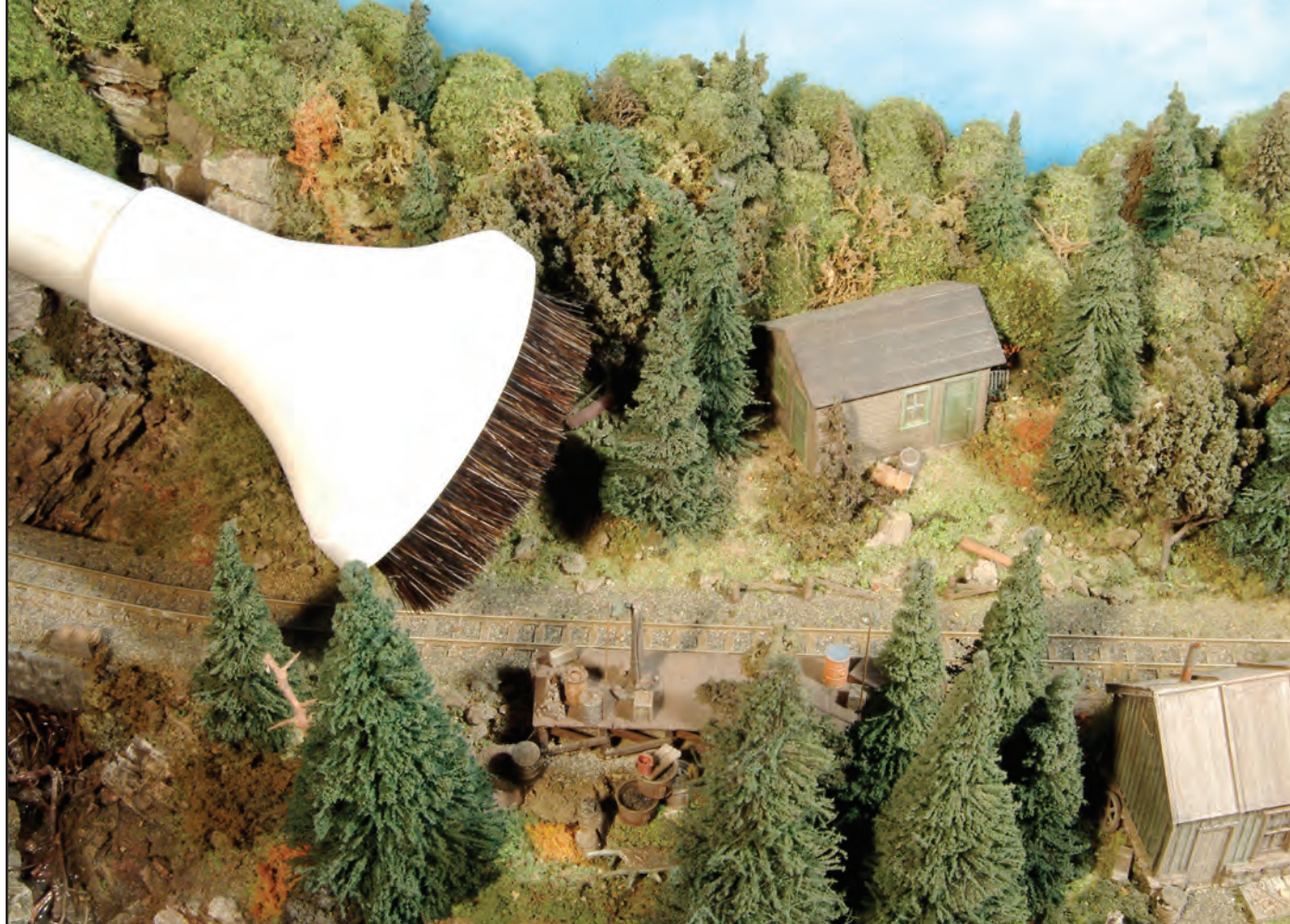
Now, all that's left to do is to add a few track details, and your layout will be complete. Stand back and enjoy what you've created!



Some ballast on this siding was deliberately left on the ties to show neglect. Fine green scenic foam was sprinkled on the ballast to look like weeds.



Even hi-rail track looks better when it has been properly ballasted. Ballast on model track serves the same function as on a prototype—it holds the ties and rail in place. Carl Chancey layout



When your scenery looks flat and dusty, it's time to vacuum the railroad. Make sure all the little details are glued in place so you won't have to rummage through the vacuum cleaner's dust bag to find them.

Rejuvenating old scenery

The most difficult task any modeler faces is keeping his or her models clean. Whether you build ship models or elaborate railroad scenery, accumulations of dirt and dust will cause your work to look old before its time. Colors fade on scenery, and the grass and trees become monochromatic. The change is so gradual that you don't notice it until it's almost too late.

Much of this fading is due to dirt, lint, dust, and cobwebs that settle on horizontal surfaces. Sunlight and fluorescent light cause the colors to fade, too. This chapter describes some ways you can prevent this damage, and it also covers some techniques for sprucing up tired scenery and keeping your layout looking young.

Keeping out dust and dirt

Dust is a model railroad's worst enemy, as anyone who has spent hours cleaning grungy track will attest. The simplest way to keep dust, dirt, and scenery-fading light off your railroad is to build an enclosure. Model builders do this to protect their miniature aircraft, ships, and automobiles, and model railroaders can do the same. A layout cover can be sheet plastic, black cloth, or any other material that will keep out dirt and light.

An enclosure may not be practical, particularly if you use your layout often. Or maybe the scenery has already faded to the point that it can't be revived, in which case you may want to consider removing the buildings and replacing the scenery altogether.

In most cases, however, you can save your scenery by removing the dust and dirt. Before discussing ways to remove dust, we should mention ways to prevent some of it from reaching the scenery in the first place.

I've worked on several model railroads in rooms that had separate heating and air conditioning systems. Temperature and humidity were regulated, and the air circulating through the rooms was filtered. Fortunately for those of us with smaller pocket books, there are less expensive measures.

Room preparation is the place to begin, unless your layout is already in place. I started building my first model railroad without giving any thought to preparing the room, and I've paid for that lack of forethought many times over. As with many modelers, my layout just kind of happened, then grew and grew. By the time I noticed how dirty it was getting, it was too late to take some protective measures. So if you're between layouts or haven't started building, now is the time to think about preparing the room and minimizing dust and dirt.

The first step is to seal the floor if it's cement. This will hold down the cement dust and make the floor easy to clean. If your floor is brand-new floor, apply epoxy cellar floor paint (several brands are available). It rolls on like regular paint, and when it sets, it provides a tough but easy-to-clean surface. For older cement floors, use "garage floor" epoxy paint that's made for older or stained surfaces.



A funny thing happens to scenic foam after many years on a layout: It fades and turns brown, and patches wear off! What's needed is a new, fresh layer of foam to hide the old stuff.

Several coats of thick floor paint will seal hardwood or laminate floors, as will indoor/outdoor carpeting. But remember that carpeting has to be vacuumed regularly because it traps dirt and dust.

If your layout is going in a new basement, seal the walls with fresh paint. I insulated my cellar walls to make the railroad room warmer and cleaner. I installed sheetrock over the insulation and attached my backdrop to it.

Next comes the ceiling—it's even more important than the floor. It should be insulated and then finished with wallboard, ceiling tiles, or another dust-proof ceiling material. I learned this the hard way by watching a continuous snowfall of dirt filtering down from between the beams onto my layout as my children played in the room above.

George Sellios installed a second, lower ceiling over his Franklin & South Manchester layout. It's suspended from the room ceiling and contains white acoustical tile and the layout lighting grid. George attached sheet-plastic side curtains to the outer edges of the second ceiling. Between work and operating sessions, the side curtains are rolled down to keep dust off the layout.

I used a similar approach on several portable layouts while they were in storage: I added removable 1" x 2" corner posts and draped sheet plastic over them so the sides of the sheet

extend below the layout frame. I used rolled Velcro to attach the sheet plastic to the underside of the frame. This makes a seal that's good enough to keep the layout clean for months or even years.

Cleaning routine

If the above preventive measures seem impractical, then you should establish a layout cleaning ritual that is part of your regular layout maintenance routine. I completely clean my layout twice a year using an industrial-strength shop vacuum with a soft brush attachment on the nozzle.

The first step is to go around the layout and glue down all the details that have come loose since the last cleaning. Then remove locomotives, rolling stock and unattached structures and take them to another room—or outdoors. Clean them with a compressed air, using a soft brush to loosen the dust. If the rolling stock is very dirty, you may have to wash the roofs with a soft, damp brush and dry with a soft cloth.

Next, vacuum the track and scenery, keeping the nozzle away from treetops and other places where it might lift foliage. Don't let the nozzle touch water surfaces because it will scratch them. Hold the nozzle 2" to 3" above the scenery, and use a large, soft brush to loosen dust and sweep it toward the nozzle. The brush may loosen scenic texture, figures, and loose details,



These rocks were spruced up by cleaning them and touching up the paint. After re-coloring them, the author lightly dry-brushes them with titanium white.

so tape a piece of nylon stocking over the nozzle to keep loose items from being sucked down the hose.

Repairs and touchups

After vacuuming, check for spots where texture has come off or the underlying scenery base has been exposed. Touch up these areas with a dab of latex paint and a pinch of new texture.

Faded scenery can be re-colored by adding fresh scenic foam. Wet the scenery, sprinkle on the foam, re-wet the area, and bond the foam in place with matte medium applied with an eyedropper or spray bottle. Once you start applying new foam, you'll probably want to continue around the layout if possible, so all the large expanses of texture will have an equal brightness.

Roads and bare dirt areas can be repainted by taking small quantities of the earth and black colors described in Chapter 3 and thinning them with a little more water. There's no exact formula, just take a cup of earth-colored paint and thin it with wet water until it can be flowed over roads and bare ground. You want the paint to flow and find its own way down the road and into the texture on the edges. Allow it to dry

and evaluate the coloring. If it needs more color, paint it again.

Dusty rocks can be revived by spraying them with wet water and brushing the dirt away with a stiff-bristled brush. Wet the rocks again and pat dry with paper towels to remove dirt and water. While you're cleaning the rocks, you may also want to restore and re-color the vines and low bushes clinging to ledges and outcroppings. Just dab on a little of the paint saved from coloring the ground cover—a little paint will go a long way. Be ready to mop up excess paint with a paper towel.

Grassy areas that, for one reason or another, can't be "re-sodded" can be painted with green acrylic paint dissolved in isopropyl alcohol or wet water. I use Apple Barrel brand (or other craft store) acrylic paints for my coloring agents. They are inexpensive and come in a wide variety of colors. For grass re-coloring, I've used Christmas Green, Deep River Green, Kelly Green, and Spring Green. These paints are also excellent for structure painting, so they won't go to waste if you don't use them all on your scenery.

Start with the proportions of about 4 tablespoons of paint to 16 ounces of

wet water—more or less depending on the brand. Start by adding drops of paint to the water until you get the color density you want. Test the brightness of the color on an out-of-the-way section of scenery—some area you can cover with bushes if the color is too bright. Judge the color after it has dried. When you get a mixture you like, flow it on the grassy areas, letting capillary action draw the color into hard-to-reach areas. Scenery that has been colored this way will resist fading for a long time. Store any leftover color in small jars for future touchups or for coloring weeds and small bushes.

Re-color tree foliage by wetting it and sprinkling on more scenic foam. Extremely faded trees may have to be repainted. Start by cutting a V-shaped slot in a square of cardboard. The size of the square will depend on the scale you are modeling in.

Slide the slot around the trunk of the tree and pull it up so the new color will strike only the foliage. If you own an airbrush, use it to spray the foliage with the same green colors you used on the grass. If you don't have an airbrush (or you'd rather avoid the hassle of setting it up and cleaning it), just purchase several cans of flat green spray paint and use them. Either way, don't color the trees too dark and protect the other parts of your layout from overspray.

Cleaning waterways

Nothing looks worse on a model railroad than water that has lost its sparkle and shine. Water areas are a good indicator of how much dirt has settled on the rest of your railroad.

To clean water, begin by dusting it with a soft, damp cloth to remove loose surface dirt. To restore the water's shine and sparkle, wash the surface with a solution of dish detergent and warm water applied with a wide, soft brush. The brush also makes it easy to wash between rocks and around tight areas where a cloth can't reach. Use cotton swabs to clean around objects like rocks, pilings, and other details.

When the detergent solution loosens the crud, brush the surface with a dry brush and finish by wiping with a clean, soft cloth to dry the surface. You'll be surprised how much dirt you find on the cloth. You may have to repeat this



A quick and easy way to make old, scratched, and dirty water look like new is to clean it and resurface it with gloss medium. Bob Hayden module

process several times before all the grime is removed. After the water surface dries, vacuum it again to pick up loose texture material or lint.

If the washing didn't quite restore the water to its original beauty, you may have to resurface it. Gloss medium is an excellent choice for revitalizing "tired" water surfaces. Apply a new layer of gloss medium over the clean waterway. Duplicate waves, ripples, and other details from the original surface or add them where they didn't exist before.

After the gloss medium dries, apply a coat of gloss varnish to seal the medium and make it less sticky. Don't panic if the water turns milky white; it will dry clear.

Layout lighting

Like many modelers, I use fluorescent lights over my layout and workbench. They are easy to install, produce little heat, and are inexpensive to operate. But they produce ultraviolet light that fades scenery, just like ultraviolet light from the sun.

The amount of fading is proportional to the length of exposure and light intensity. If you have sunlight streaming in a window or a lot of light over your layout, the scenery will fade more quickly. One remedy is to cover the

lights with ultraviolet shields. These are either tubes of clear plastic that slide over the fluorescent tubes or 2' x 4' sheets that can be taped over the fixtures. Both are effective.

You can illuminate your layout with incandescent lights, but they're more costly to operate and produce a lot of heat, which also isn't good for scenery. If you use incandescent lights, mount them well above your layout.

Some modelers like to use fluorescent lights for general illumination and incandescents as spotlights to highlight particular scenes or structures. Whatever arrangement you decide to use, a little preventive effort will protect your layout from light damage.

Reviving dead lichen

In earlier editions of this book, I devoted several paragraphs to restoring faded and dried-out lichen. Nowadays, my advice is usually this: Forget it. If the lichen is old and dirty, remove it and replace it with Woodland Scenics Poly Fiber trees. Unlike lichen, Poly Fiber is not an organic product, so it can be re-colored many times by spraying with the matte medium bonding spray and sprinkling on a fresh coat of scenic foam.

If your layout has lichen in hard-to-reach places—or only small patches of it have gone bad—you may want to re-color it. Here's a formula I've used; use it as a starting point for creating your own revitalization solution.

Mix together 1½ cup of glycerine, 1½ cup 70-percent isopropyl alcohol, and 1 tablespoon of green acrylic paint (Apple Barrel brand craft store paints works well). The amount of paint you'll need will vary, depending on the color and the manufacturer, as well as the color of the lichen on your layout. Experiment on some scrap lichen before using it on your layout.

Put the mixture in a spray bottle and spray the lichen. After 24 hours, squeeze a piece of lichen; if it's not soft, apply more of the mixture. It may take several applications for the new color to saturate the foliage.

Last resort

In the end, if these techniques fail or seem like too much work, you may find it easier to replace old, tired scenery. Remove trees one by one and save them, remove the buildings to a safe place, and pack the rolling stock out of harm's way. Tear out the old scenery areas, turn to the front of this book and start reading!

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Index

A

Access hatches, 29
Acrylic gloss medium, 91
Acrylic modeling gel, 92
Acrylic paints, 33
 Basic colors, 36
Adhesives, 32
Autumn scenes, modeling, 127

B

Backdrops and backgrounds
 Clouds, 105
 Colors, 101
 Materials, 99
 Mountain stencils, 109
 Mountains: distance and color, 109
 Painting, 102
 Photorealistic backgrounds, 111
 Printed paper backgrounds, 110
 Three-dimensional hills, 110
Background trees, 77
 Bottlebrush, 78
 Chenille bump pine trees, 80
 Loofah sponge trees, 79
 Poly Fiber trees, 77
 Scouring-pad pine trees, 81
 Toothpick pine trees, 80
Ballasting track, 135
 Rails and ties, weathering, 135
 Weathering ballast, 137
Bead board scenery, 27
Bottlebrush trees, 78

C

Cardboard strip method, 14
 Making cardboard strips, 15
Colors
 Basic, 33
 Generic scenery colors, 34

D

Dirt roads, 67

E

Earth texture, 35
EnviroTex water, 92

F

Fake fur grass, 37
Flocking, 38
Foreground scenery
 Active and transition areas, 114
 Close-up scenery techniques, 118
 Color as a leading element, 115
 Colors, 118
 Composition, 113
 Dry-brushing techniques, 125
 Foliage texture and detail, 119
 Leading lines, 114
 Live scenery areas, 120
 Structures as scenery, 120
 Rule of Thirds, 116
 Weathering, 121

Foreground trees, 75
 Evergreen trees, 76
 Pine trees from kits, 76
 Sagebrush trees, 74
 SuperTrees, 73

G

Grass
 Autumn, 127
 Blends, 37
 Fake fur, 37
 Flocking, 38
 Textures, 36
Gypsolite, 26

I

Ice
 Acrylic formula, 129
 How to make, 133
Icicles, 131

L

Lakes, *see* Water
Leaves, 74
Lichen
 Preserving and coloring, 40
 Reviving, 141
 Used in tree-making, 73
Lighting, 141

M

Maintaining scenery, 138
 Cleaning routine, 139
 Cleaning waterways, 140
 Dust and dirt, keeping out, 139
 Layout lighting, 141
 Repairs and touchups, 140
 Reviving dead lichen, 141
Marble quarry, modeling, 57
Matte medium bonding solution, 32
Measuring scenery materials, 9
Molds, making for casting, 44
Monuments and hoodoos, 58
Mountains, Styrofoam, 24

P

Planning scenery, 7
 Mock-ups, two-dimensional, 8
 Models, 10
Plaster cloth, 21
Plaster, 16
 Pre-coloring, 19
Poly Fiber foliage mats, 62
Poly Fiber trees, 77
Polyurethane foam, 28
Polyurethane foam scenery, 27
Ponds, *see* Water

R

Retaining walls, 56
 Foam, 57
Roads
 Dirt, texture, 67
 Paved, texture, 68

Roads (cont'd)

 Tar, texture, 68
Rock castings
 Attaching to layout, 46
 Casting in place, 47
 Coloring, 50
 Molds, using, 42
 Molds, making, 44
 On the workbench, 43
 Rock powders, accenting with, 55
Rock powders, 55
Rocks
 Carving in plaster, 42
 Casting in plaster, 42
 Painting polyurethane rocks, 53
 Polyurethane foam, 51
 Shadows and highlights, 51

S

Sawdust, coloring, 39
Scenic bases, other types, 30
Scenic foam, 36
 Making your own, 38
Scenic foam putty, 66
Scenic form construction
 See also Foreground scenery
 Cardboard strip method, 14
 Cardboard web, 15
 Gypsolite, 26
 Mistakes, fixing, 18
 Mountains, Styrofoam, 24
 Plaster cloth, 21
 Plaster over wire screen, 14
 Plaster-soaked paper towels, 19
 Scenic bases, other types, 30
 Scenic shell, 18
 Sculptamold, 22
 Sculptamold over Styrofoam, 26
 Styrofoam insulation board, 23
 Tunnel portals, 17
Scenic shell, construction, 18
Sculptamold, 22
 Adding color and texture, 23
 Over Styrofoam, 26
Sealing foam scenery, 30
Shadows and highlights, rocks, 51
Silflor, 65
Snow
 Acrylic snow "goop," 129, 130
 On structures, 131
Styrofoam, 24
Styrofoam insulation board, 23
SuperTrees, 73

T

Textures
 Bare ground, 67
 Dirt roads, 67
 Earth texture, 35
 Bonding to layout, 39
 Grass, 36
 Grass and texture blends, 37
 Layers, 60
 Lichen, 63

Textures (cont'd)

 Paved roads, 68
 Poly Fiber foliage mats, 62
 Scenic foam putty, 66
 Silflor, 65
 Tar roads, 68
 Undergrowth, 62
Tools and materials list, 12
Trees
 Background trees, 77, 111
 Bottlebrush trees, 78
 Chenille bump pine trees, 80
 Commercial trees, 70
 Evergreen, 76
 Foreground trees, 75
 From dried flowers, 73
 Leaves, 74
 Lichen for fullness, 73
 Loofah sponge trees, 79
 Pine trees from kits, 76
 Poly Fiber trees, 77
 Rubber-stamp trees, 111
 Sagebrush trees, 74
 Scouring-pad pine trees, 81
 Stumps, 82
 SuperTrees, 73
 Toothpick pine trees, 80
 Winter trees, 131
Tunnel portals, 17

U

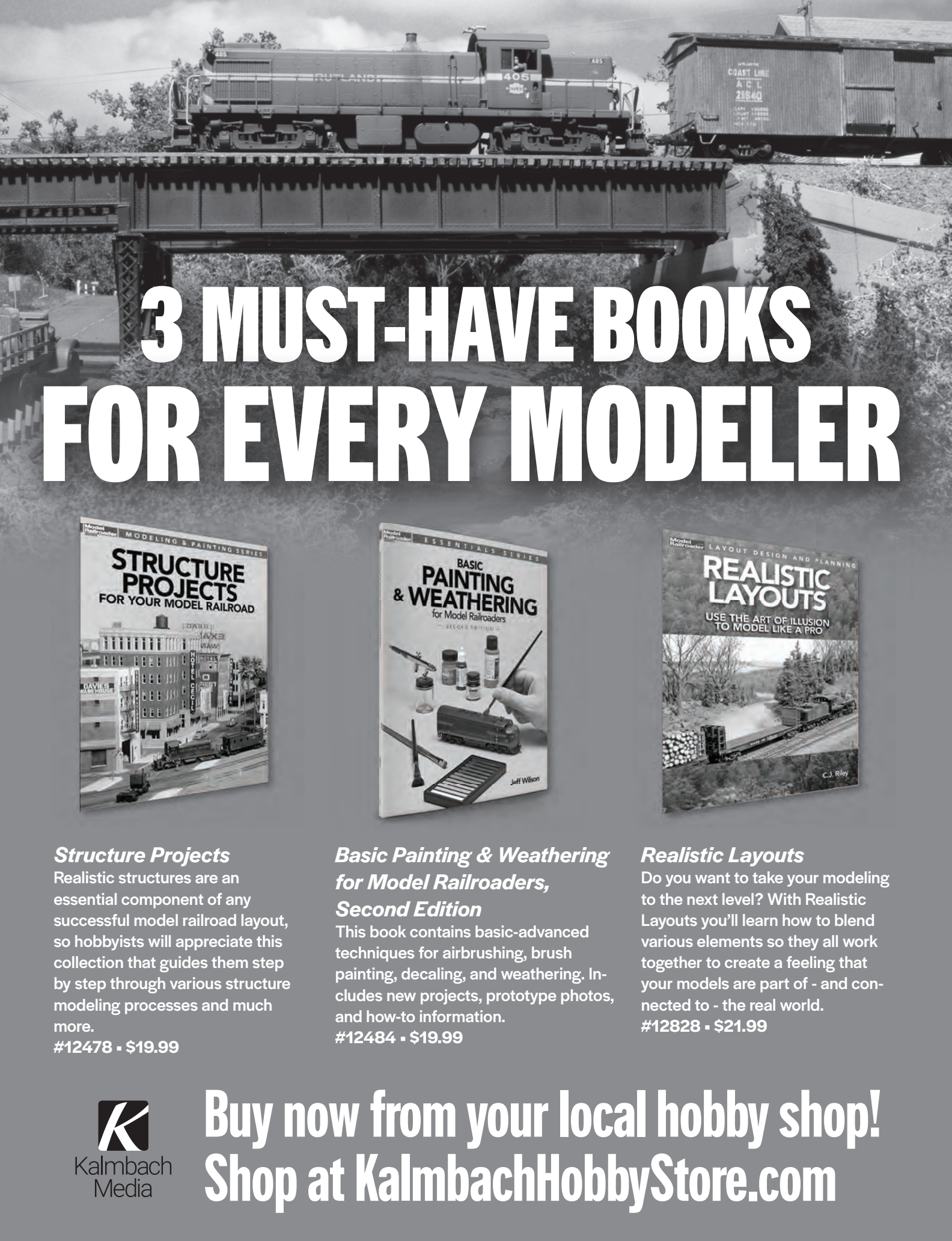
Undergrowth, 62
Universal tinting colors, 50

V

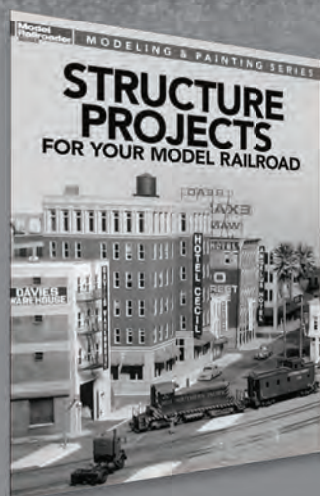
Vines, 84

W

Water, 86
 Acrylic gloss medium, 91
 Acrylic modeling gel, 92
 Cleaning on layout, 140
 EnviroTex water, 92
 Flat base, preparing, 87
 Lake and pond bottoms, 87
 Lake Film, 95
 Ocean painting, 88
 Plexiglas water, 95
 Puddles and drips, 96
 Realistic Water, 94
Waterfalls, 96
Weathering
 Ballast, 137
 Rail and ties, 135
Weeds, 84
 Autumn weeds, 128
 Scouring-pad weeds, 85
Wet water, 34
Winter scenes, modeling, 129
 Backdrops, 132
 Background trees, 132
 Lighting, 133
 Trees, 131



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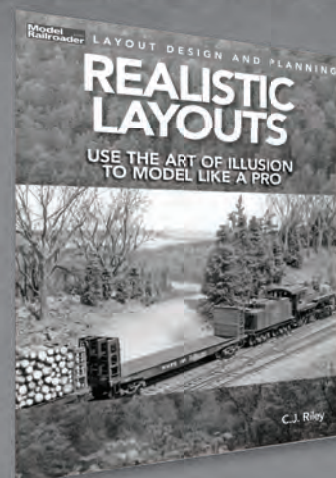
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- Build foreground scenery that will stand up to close scrutiny
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