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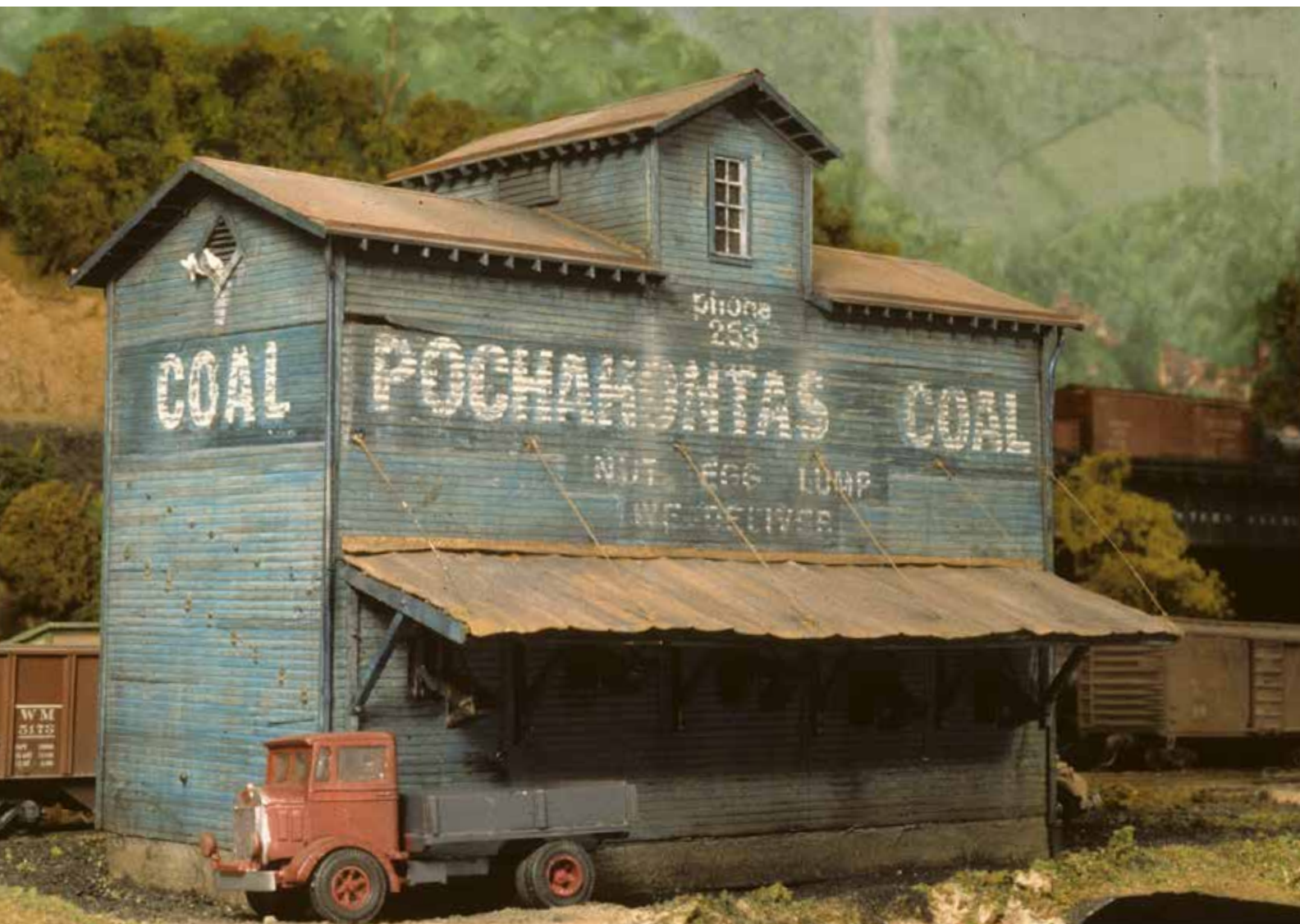
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down a hillside toward a stream.

It is often said by engineers that the three most important design considerations for a roadbed are drainage, drainage, and drainage. Good modeling will recognize this with proper ditches and regular culverts. I have a Western Maryland right-of-way diagram from a grade in the



26 This very tall concrete and stone arch is on the Black Fork grade of the Western Maryland east of Elkins, West Virginia. My wife, at 5'-4", is dwarfed by the arch. We found debris apparently left by storm water high on the wing walls, illustrating the importance of culverts to protection of the roadbed. *CJ Riley*

Alleghenies that indicates a culvert every 150 feet or so. There were many sizes and materials indicated but it was a clear indication of the importance of culverts.

Even in normally dry country, when it rains or snow melts, the water must go somewhere. Thus as modelers, we should pay close attention and include many culverts along our rail lines and roads. Culverts can be as simple as a steel pipe (soda straw or other tube), a pipe with a concrete headwall, a concrete box, a larger corrugated metal pipe, a stone arch (with side wing walls), a short wood trestle, or a simple bridge composed of a series of steel I-beams under the width of the rails. And a road that crosses the tracks will definitely have an appropriate culvert to carry the railroad's ditch water.

Bridges also carry roads and highways across railroads and streams, 27, and those bridges should be just as carefully modeled as the ones carrying railways. The structural components of a road bridge will be lighter than a railroad bridge of equivalent span, but the various details still apply. Elevated road crossings may be the last holdout of timber framed bridges, 28, therefore providing an opportunity for modelers with the trestle-building urge. Other types of wooden and simple steel beam bridges can be found supporting roads, and I have seen old flatcars recycled

LEARNING POINTS →

1. Select the proper type of bridge for the situation.
2. Provide proper piers and abutments along with appropriate bridge pedestals.
3. Only support bridges at the proper bearing points.
4. Skew the structure for angled crossings.
5. Culverts are also bridges and are much more common.
6. When laying track over a bridge (unless it's a ballasted deck), don't use ordinary sectional or flextrak on the girders. Use track designed for bridges, which has thicker ties placed closer together.
7. If kitbashing a bridge, remember that if the span is made longer the load limit will be reduced.

into bridges, especially on private drives.

Don't panic when faced with needing a bridge—keep the basic dos and don'ts in mind, and if in doubt, check prototype photos and refer to more-detailed books for further information. With some care, your bridges and culverts can be a highlight of your model railroad.



27 Railroads also go under bridges, frequently those of roads. This is a very old cast iron pin-connected truss bridge near Sand Patch Pa. *CJ Riley*



28 Road overpasses built from wood can still be found in rural areas on secondary roads. This would be another way to satisfy the trestle-building bug. *CJ Riley*



CHAPTER SIX

Modeling structures

While our trains should be the focus of attention, and scenery provides the setting for them, there would be little work for our modeled railroaders without structures to be served.

Be it the local depot, **1**, large industries, or places for inhabitants to live and shop and visitors to stay, structures are important to creating a sense of place and reason for being.

The B&O often built substantial brick depots in small towns along its original line to the Ohio River. One of the B&O's handsome mountain depots is at Oakland, Md. It was designed in the Queen Anne style by E. Francis Baldwin, architect for many of the railroad's more elegant depots.

CJ Riley



CHAPTER EIGHT

The importance of color

On a sunny day in June 1964, this brand-new Santa Fe 86-foot auto parts car appears bright red and the neighboring Wabash car is a deep, dark blue. On a cloudy day, however, the red will appear muted and not as bright, and the dark blue will appear almost black. As the cars age, the color shades will change as paint oxidizes and grime and dirt coat the car.

John S. Ingles; J. David Ingles collection

I've touched on the subject of color in previous chapters, but there's more to this complex subject worth further exploration. Color can stir up many arguments (such as what exactly the "proper" match is for such-and-such railroad's paint schemes), **1**, and failing to accurately capture colors—whether on equipment or in nature—can kill the realism of a scene or an entire layout.

Perceptions

We must first understand that individuals perceive colors differently (without even getting into color blindness). Color appearance changes considerably in different types of light—this effect is measurable as color temperature. For example, outdoor light has more blue than most indoor lighting, but outdoor light varies by time of day (light near sunrise and sunset has more reds). Clouds and atmospheric conditions also affect color perception.

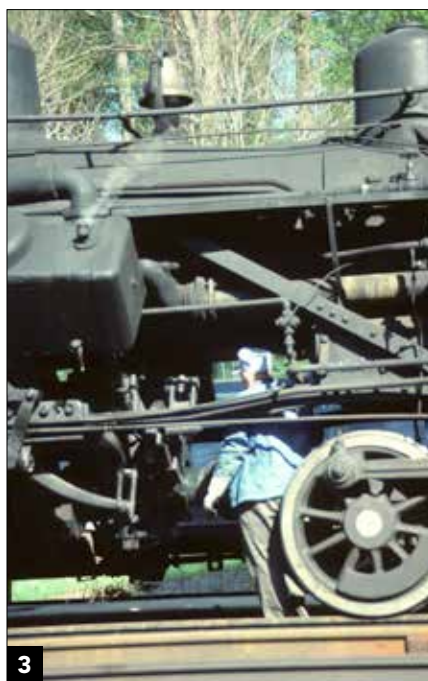
Indoor (artificial) light varies considerably: incandescent bulbs make colors appear warmer and redder; most fluorescent lights will make colors seem cooler or greener (but tubes vary widely); LED and halogen bulbs provide a still different light and therefore affect the appearance of color. Also keep in mind that color reproduction in photographic prints, on the printed page, and on computer monitors may also vary considerably from the original image.

It isn't the color that changes. The actual color is determined by the pigments and other ingredients of paint (and other materials). The light determines how our eyes (and brains) perceive the color. So if it was important to precisely match a prototype color by finding a paint chip or mixture that is indistinguishable when holding it against the color to be matched, that would be just the beginning. The change in appearance from the original light to the light used to illuminate the model will need to be considered.

As an example: If you painted an HO boxcar with the same dark blue paint as used on the Wabash boxcar in 1, and held it outside in the same bright sunlight, you'd be very happy with the color. However, when you brought that car inside and placed it on your layout under relatively dim (compared to direct sunlight) incandescent bulbs, you would be disappointed to see that it looks black. Then, when you brought it to your workbench and held it directly under a bright light bulb, you would be disappointed again as the blue might



Western Maryland No. 6 pulls a freight on the Cass Scenic Railroad in West Virginia. While the freshly painted locomotive looks terrific, the detail is completely lost in the glossy, pitch-black paint. *CJ Riley*



Even on this well-maintained museum piece (Cass Scenic Heisler no. 6), the paint is several years old and has weathered to dark gray. The detail is much easier to see, but there is still a slight gloss. A model painted like this would look right even indoors in artificial light. *CJ Riley*

take on a slightly purple tone (from the red shift caused by the bulb).

Another fundamental tenet is that black and other dark colors hide detail, 2. Freshly painted steam locomotives were gloss black, but—because black



There are several shades visible on these model Union Pacific steamers being fueled and watered. None are black, yet they all look correct as our eyes accept them as black. Painting like this represents the passage of time since each locomotive has been out of the shops a different amount of time.

Mike Brock

and other dark colors absorb light—it's almost impossible at times to see shadows and intricate features on their surfaces. This obviously also applies to black and dark blue diesels and freight cars as well. It's not until these items start to weather and fade, 3, that details begin to emerge. The lesson to take in modeling is to paint our models in lighter shades, 4, to account for these factors.

If that weren't complicated enough, standard freight car, locomotive, and structure colors will vary even on



CHAPTER TEN

Setting the mood

Atmosphere of one kind is this hazy shot of the diesel shops on Allen McClelland's HO scale Virginian & Ohio. But atmosphere can have many other important meanings as well.

W. Allen McClelland

While creating a mood on the model railroad should be our main focus, **1**, much can be done with the railroad room or basement and environs to add aura, mystique, and a sense of place and era. Creating a meaningful environment can supplement all of our other efforts in producing an understanding of the time and place we are presenting. While basement railroad rooms are common, other rooms are frequently used and these comments apply to any chosen location.



2

J.J. Johnson had an artist paint the walls between his layout and workshop/guest room in this fanciful log cabin theme. The raccoon visible outside the room can be seen peering through the window on the inside, while his friend is on the ceiling, peering through the damaged roof. CJ Riley

Begin with the approach to your room. I have seen a train room off a home's main living space that was painted (by a professional) with a mural of an exterior depot wall. A nearby wall around the work room/ spare bedroom was painted as a log cabin, complete with raccoon peering in the window, 2. On the opposite face of that wall was the same scene from the interior perspective.

It is certainly not necessary to go that far, as charming as that might sound, but much can be done to ease the transition from living space to a

working railroad set in your chosen era. The walls of the basement stairs would ideally be finished and can be decorated with appropriate railroad memorabilia. In my former home, I built a wall at the bottom of the stairs with a pocket door to keep pets away from the trains. The wall was finished to look like the left-hand portion of an older double sheathed wooden boxcar side, complete with my model railroad's reporting marks, chalk marks and some historical graffiti, 3. I found an old grab iron buried in the cinders while waiting for a steam excursion to exit Sand



3

I built this three-quarter-size boxcar wall at the entrance to my train room using tongue-and-groove "porch flooring" for the wall, hardboard for metal reinforcing straps, and carriage bolt heads as rivets. The wood was pre-weathered using modeling techniques and the lettering applied using stencils and paint. CJ Riley

Patch tunnel on the Baltimore & Ohio and mounted it appropriately.

Once in the layout room, work and operating sessions are enhanced if the room is finished and well lighted. Room finishing and decor doesn't need to be fancy or expensive, but the more "railroad" the better. My own preference is to separate the railroad from the aisles with a finished fascia and lighting valance. With minimal lighting in the aisles, the railroad is framed and enhanced like the stage in a theater. It also helps to have an assigned sitting/congregating area