



Above: The number "Veronique" is a flashback showing Lily's first Broadway triumph. Note that the Arc de Triomphe bears a pattern similar to the interior of the train's drawing rooms.

Working with Coleman, Comden and Green imagined their musical of Twentieth Century as a modern opera buffa, with a score more reminiscent of Rossini than of Gershwin, Berlin, or Porter, a decision that suits the characters, most of them Broadway denizens who can turn the tiniest problem into a soul-shattering crisis. The action of On the Twentieth Century begins in Chicago, where theatre producer Oscar Jaffe's latest epic, an historical potboiler titled Joan of Arc's Problem, is dying by inches. The show's closing, the latest in a string of flops, leaves Oscar on the edge of bankruptcy. Beating a retreat with his two henchman, Owen and Oliver, he books a drawing room on the legendary fast train, the Twentieth Century Limited, bound for New York. As always, Oscar has a plan: The adjacent drawing room is occupied by Lily Garland, Hollywood star and Oscar's greatest discovery, whom he plans to lure back to the stage.

It's a tall order: Lily was a drab piano accompanist named Mildred Plotka when Oscar got his hands on her, giving her the glamour treatment and turning her into Broadway's brightest star. But, as Lily learned, no Manhattan penthouse was big enough to contain both of their outsized egos, and, driven mad by Oscar's controlling ways, she fled to Hollywood. Calling their breakup acrimonious is putting it mildly; the very mention of Oscar's name is enough to send Lily into a conniption fit. (She is currently accompanied by her fiancé, the fatheaded Hollywood hunk Bruce Granit.) But nothing stops Oscar: Improvising on the spot, he offers her the lead in a new drama about Mary Magdalene-the script of which doesn't exist, but never mind. He even finds a backer on the train in the form of Mrs. Letitia Primrose, the elderly heiress to a patent medicine fortune. In reality, Letitia is a religious maniac, on the lam from a Midwest asylum, who has been covering every available surface on the train with stickers saying, "Repent!" Over the course of the 16-hour train trip, Oscar and Lily argue, seethe, reminisce, romance, plot, and generally have at each other-egged on by Owen, Oliver, and Bruce, while Mrs. Primrose dangles a \$200,000 check in front of them all.



In the number "Babette," Lily fantasizes taking Broadway by storm in a Somerset Maugham vehicle. Bold light cues signal her "conversion" to the role of Mary Magdalene.

On the Twentieth Century makes many unusual demands on a creative team. It unfolds in multiple locations—most of them very swank—and it must move like a locomotive at full speed. Furthermore, Harold Prince's original production, with scenery by Robin Wagner and lighting by Ken Billington, is considered something of a classic. Fortunately, the current production, under the direction of Scott Ellis, has everything one would wish.

Deco on wheels

Much of the action takes places in the confines of Oscar and Lily's drawing rooms, as well as the observation car next door, but the title number takes place in Chicago's Union Station and the finale is set in Grand Central Station. There is a flashback sequence, showing Lily's triumphant Broadway debut, and a fantasy sequence, in which she stars in an English drawing room drama. A second-act chase scene takes place over the train, including a show-stopping moment on the front of the engine. That's a lot of scenery to pack into the American

Airlines Theatre.

"It was thrilling and terrifying," says David Rockwell, the production's set designer. "The American Airlines is very small, and there is almost no room at stages left and right." He adds that he began designing the show with the idea that it would play the Stephen Sondheim Theatre, which is also operated by Roundabout, but the long-run success of *Beautiful: The Carole King Musical*, made that an impossibility.

In any case, Rockwell says he immersed himself in the world of *On the Twentieth Century*, which is to say the heyday of art deco-influenced industrial design. "One thing I noticed right away is that the poster art from that period is so much about dynamic movement, presented in forced perspective." This is realized in the show curtain, in which the play's title is embedded in a forced-perspective view of a train and what looks like powerful beams of light. The designer adds, "The piece that required the most tweaking was the show drop. It consists of two metallic fabrics, with a different laser-cut graphic in each quadrant, and lights



Top: The full train interior, showing two drawing rooms and the adjoining observation car. Above: Rockwell's sketches for the same.

built in. We adjusted the lightboxes and the reflective metal trim to give it more pop. At the same time, we didn't want to put glare in the audience's eyes."

But first, last, and, always, there was the train. "There were key things to be realized in its design," Rockwell says. "It had to be finely detailed, luxurious, and defined by speed and extravagance. The Twentieth Century Limited offered travelers a kind of opulence that wasn't available before."

This led to the second key influence, the work of Henry Dreyfuss, a famous industrial designer of the '30s and '40s whose projects included the locomotive for the 20th

Century Limited. (Among other things, he also invented the princess phone.) "His design for the 20th Century was in 1938," Rockwell says, "and the play is set in 1933, so the design is an amalgam of ideas from slightly different periods. [The 20th Century Limited ran between 1902 and 1967.] But from this research, we learned that so many art deco materials were realized using mixed metals. It wasn't all chrome—there was a lot of gold, brass, bronze, and silver." The design's insistence on the importance of deco details extends to the proscenium, which frames the action in the same deco pattern seen in the show's deck. "The show portal is important because in that theatre it

can be difficult to connect with an audience for some reason," he says. "The portal is a lightbox, which creates a deco emphasis around the stage."

It goes without saying that the train is a dominant set piece, and designing it was complicated by the fact that it is necessary to show both its exterior and interior. The opening number, "Stranded Again," featuring Owen, Oliver, and the cast of *Joan of Arc's Problem*, is played in front of the show curtain, which rises to reveal Union Station. The train's exterior is full of smooth curves and includes its iconic circular-ended rear observation car, shapes designed to advertise that it is built for speed.

Getting a set piece this large into the theatre was a primary challenge. "We had to do some spatial problemsolving," says Rockwell. "When we see the train for the first time, it is in the context of the station as a diagonal, and when we go on into the train, it turns around, á vista. It took a lot of work to figure out; because of the width of the theatre's proscenium, the depth of the stage, we have to pull the back of the train off as it completes its turn. Mechanically, it features a complicated chassis, upon which the train cars can move left and right. In addition to moving up and downstage, the chassis also contains a circular gearing mechanism, referred to as a 'turtle,' which allows the entire train to rotate during the opening sequence." (The production's scenery was built, painted, automated, and electrified by Milford, Connecticut-based ShowMotion.) For certain sequences, including the song "Together," sung by her adoring fans when Lily boards the train, a set of four roll-on train exterior units, with windows, come on. They hold chorus members who peer through the "windows."

Rockwell notes that designing the two drawing rooms and observation car involved a certain amount of guesswork: "There aren't many photos of what train interiors looked like, although there are some beautiful paintings." In the show, the drawing rooms are largely done in white, with brass details. The walls feature a kind of repeating shell pattern, the windows on the doors are marked by a kind of curved "W" motif that reappears throughout the set design, and the furniture offers a third pattern. "We created three different wallpapers, three in each car," he adds. "We coordinated the upholstery fabrics with [the show's costume designer] William Ivey Long. In the opening number, everyone's luggage is individually colored to play off their costumes."

Rockwell also emphasizes his use of rounded surfaces. The doorways and ceiling are curved and the bathroom unit in each drawing room is cylindrical in shape. Even the lighting sconces are globular. "That sort of sensuous shaping is very much a part of the train's design," he says. The observation car is realized in warmer, rust-colored tones. When all three cars are on stage, the train is 30' long; it weighs 13,000lb.

As mentioned, the train moves left and right; at different times, the stage is occupied by both drawing rooms only, or Oscar's drawing room and the observation car. It also moves upstage to accommodate flashbacks and fantasy sequences. "The space is so confined that, when it moves upstage, the lounge chairs in the observation car retract back onto the platform," Rockwell says.

The first major non-train sequence is the number "Veronique," in which Lily achieves stardom playing the young lady "who precipitates the entire Franco-Prussian War by refusing to smile at Otto von Bismarck." The scene begins in an empty Broadway theatre, represented by a piano and a couple of rigging pipes, on which are hung some vintage lighting instruments. Lily, in her Mildred Plotka getup, begins sight-reading a song for Oscar, and the number gradually shifts into full production mode. There is a startling á vista costume change for her, and in comes a drop showing the Arc de Triomphe, lined in white lights and surrounded by red, white, and blue bunting. "We had the idea for the Arc de Triomphe right away," the designer says, adding that he brought it into stylistic harmony with the rest of the show by covering it with the same patterns seen in the train. "The material is mica, not scrim, so when it is backlit, it makes a beautifully natural translucent material that gives it a kind of richness."

The other, even more farcical, non-train moment is the Act II number, "Babette." Lily, furious at Oscar's deceptions, has signed to star as the brittle heroine of a Somerset Maugham drawing room drama, which she proceeds to imagine. The number climaxes in a dance involving the entire chorus, so Rockwell's spacious design is dominated by an upstage wall of mullioned windows beyond which is seen a photo-realistic image of London street scenes. "It's an image we took and manipulated," he says, "a photo rendered as a dot matrix image, which makes it softer." Such details as elaborate floor-length candelabra add to the impression of decadent wealth.

The joke of "Babette" is that even as Lily fantasizes herself on stage with a cigarette holder and champagne bottle, casting off one lover after another, her mind keeps returning to the Mary Magdalene play, causing her to fall to her knees and become surrounded by actors in Biblical garb. "We had to think about how quickly she changes between plays," Rockwell says. "As we developed the geometry of the room, we realized that the mullions on the upstage wall could become crosses." Thus, with the aid of lighting designer Donald Holder, this effect is used to mark Lilv's brief, on-stage conversions.

Surely the biggest challenge of all was the second-act sequence, "She's a Nut." Oliver learns the news that Mrs. Primrose is an asylum escapee, and from there the news spreads through the train like wildfire, leading to a frantic search for Mrs. Primrose that climaxes with her on the front of the locomotive, planting yet another sticker that



Holder notes that much of the lighting is tied to the warmth of the practical units built into the set.

says, "Repent."

"Scott Ellis is so fantastic to work with," says Rockwell. "We designed 'She's a Nut' ten different ways and he was open to all of them." Here's what happens: "When the number starts, the train rolls upstage and we bring on the roll-on carts downstage; through one of the windows, we see Mrs. Primrose eating a bag of nuts. The carts roll off stage and we see Oscar doing his part of the song. Next, we see Mrs. Primrose pulled across the stage sitting on a big toy train—which is probably my favorite scenic touch. Then a framed drop comes in with two vertically-tracked painted panels, one showing the front of the train and one of the caboose." When the first panel rises, we see a 11' three-dimensional replica of the front of the train moving towards us. The train is framed in a drop with flipper boards at right and left, which are typically used to list a train's destinations and here spell out the words, "She's a nut." Above the train is a map of its route, which its spelled out in lights.

The show's finale is the arrival in New York, which features a fantasy skyline of New York, followed by a white

and silver representation of the train's exterior, all matched to the all-white costumes worn for Oscar and Lily's wedding. White and gold luggage complete the look.

"It was an incredible challenge, but Scott and the spirit of the crew at the theatre mae it such a pleasure," says Rockwell. "Everyone involved is at the top of their game and it was a challenge that we all felt up to."

Comic lighting

Donald Holder, the lighting designer, says, "The challenge of the piece goes beyond the scope of it and trying to negotiate space between lighting and scenery, to make sure that all the scenery got adequately revealed. The storytelling requirements are pretty substantial. We go from Union Station, which is one scenic and lighting idea, to the train, which has constantly shifting needs, and you have to make it glamorous and sparkling. And, as we move in and out of fantasies and flashbacks, the space expands to a vast volume and back again. You have to create a vocabulary for all that and also meet the technical demands of doing it in the room. It was so much fun to be part of this

production, especially because Scott Ellis really trusted the material."

The color and sparkle of the train interior scenes, Holder says, "are motivated by the period sconces; the warmth of the light comes from them. We spent a lot of time doing mockups and tests to get the color just right. All are embedded with LED tape, with a bit of colorcorrection to achieve the appropriate color temperature. We're using different combinations of Rosco CTO and Minus Green filters, depending on the kind of tape used to get a color match for tungsten halogen sources." He adds, "We had to go with LEDs because there's only a limited amount of available power on the trains. Standard halogens would consume too much." The units are controlled using wireless DMX, part of a substantial package of scenic electrics handled by two RC4Magic DMXio devices. These include the ticket booth in Union Station, the piano lamp and cannons in "Veronique," the candelabras and crosses in "Babette," the toy plane that flies over the train at the end of Act I, the interior lighting of rolling train window units, the toy train that Mrs. Primrose rides in "She's a Nut," and the finale train exterior drop, among others.

Otherwise, says Holder, he worked to "find the vocabulary to support the comedy." The world of the train, he adds, is "gold and incandescent and warm, with pinks and ambers. When we move into 'Babette' and 'Veronique,' the palette turns to broader, more saturated, strokes of color, with lots of sweeps and live movements of the lights. Really, the shift is from an almost monochromatic palette to something that is bold and bright." "Veronique," he adds, has a "Technicolor" palette, drawing on the red, white, and blue motif of the scenery and costumes.

Lighting plays a crucial role in "Babette," the number being constructed out of mood swings between Lily's visions of her artificial Mayfair drama and Oscar's proposed Magdalene epic. "In order for the comedy to land, the lighting has to be funny," Holder says. "We sweep most of the overhead lighting rig right to Kristin Chenoweth every time there is a beat of religious choral music for each reference to Magdalene in the play, Lily's world is transformed in an extreme way and in a heartbeat." The units used in this gag are Martin Professional MAC Auras. "They're compact LED moving heads, they're pretty bright, and can zoom to a very tight beam from 11°," he adds. "The overhead back light consists of Mac Auras, and, on cue, every time there is a Magdalene moment, all 35 fixtures sweep onto Kristin. then they immediately snap back to their original focus. And of course it all happens á vista." Thus "Babette" moves from a saturated palette to "heavenly shafts á la Cecil B. DeMille."

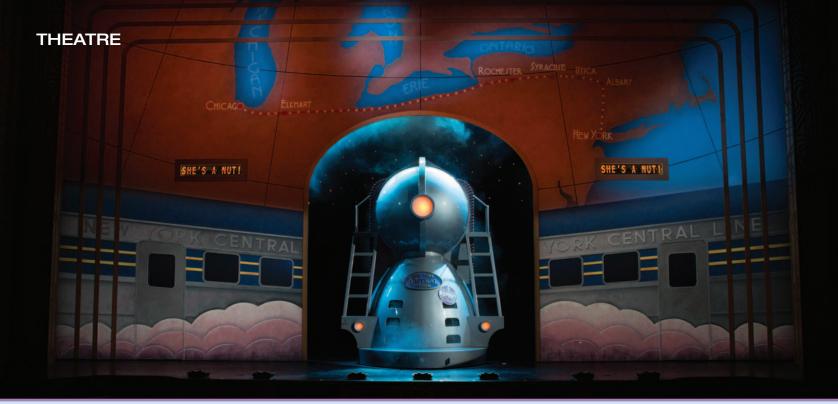
Holder adds, "There were many moments like this. Another was the reveal of the Bible on the train," when Oscar first gets his idea for the Magdalene play. "In previews, Scott Ellis kept saying, 'We can't see the Bible.' So we focused a [Martin Professional] Mac III from the balcony rail and created a throbbing effect, essentially a massive white arrow pointing directly at the Bible, so that, without a doubt, the audience saw it. I had a rare opportunity to create light cues that were pretty funny and got people laughing during the tech rehearsal."

What with the fast-moving farce action, Holder notes the lighting rig is kept busy all night long. "We have to deal with the specifics of the train, but also needed to have the resources in the air to allow for all the shifts of focus and the movement from car to car, as well as the train's multiple changes of positions. I think there are almost 800 cues in the show. Once we got into it, the need for specificity and detail, the need to consider every beat, became very clear." For example, Holder says, "'She's a Nut' is a complicated, zany story; even the lighting had its chance to be funny, as when we programmed the LEDs on the map drop showing the train's route. It was a matter of executing the sequence to the timing envisioned by Scott. In this number alone, we start in the observation car, then move inside the train, then reveal Mrs. Primrose on the front of the train coming at us, and then back to the train interior with the entire company. It was quite the technical nightmare to get through."

Again, he says, "The use of LED technology was so critical. Many of the scenic elements contained extremely thin (only 2" deep) lightboxes which were embedded with LEDs; 15 years ago, it would have been impossible to make this idea work." He adds that the proscenium is filled with SuperBright LED tape, to make the warmly colored frame that Rockwell specified.

Holder's lighting rig is an eclectic collection of units, all of them chosen to perform specific tasks. In addition to their uses described above, the Mac Auras, "with their zoom optics, can illuminate the Union Station drop with its RP backing. We had very little space to dedicate lighting positions for this. The Mac IIIs were chosen because they have an animation system for the moving train effects; they create movement on the show drop during the overture and on the interiors of the train cars. I use a set of ETC Revolutions because they have a tungsten source that I could refocus and shutter to the specific ground plan for each of the many shifting train interiors."

Also, Holder says, "The [Philips Vari-Lite] VL3500s are the workhorses in terms of glamour lighting, moving specials, pools of light, and the bright shafts of light in 'Veronique.' They can create strong shafts in the air that are crisp and defined and can also be used for movement effects like ballyhoos and chases. [Philips Vari*Lite] VL2000 Wash units, on ladders, are used to light vertical surfaces, including the train and the big New York City skyline drop in the finale and the Mayfair set in 'Babette.'" He also has



During the chase sequence tied to the number "She's a Nut," the front of the train's engine is seen, framed in a drop that, using LEDs, traces the 20th Century's route from Chicago to New York. The flipper signs at right and left announce the song's title.

a set of City Theatrical AutoYokes, which are used as refocusable specials. Lighting was supplied by PRG. Lighting was programmed (by Jay Penfield and Alex Fogel) on an ETC Eos Ti console and is run on an Eos console.

Holder says that perhaps his favorite movement comes during the climactic Act II number, "Lily, Oscar." Oscar, having faked a suicide attempt, pretends to be dying, urging Lily to sign a contract before he fades away. "We move into grand opera and it was so much fun to make a Metropolitan Opera gesture in the confines of a train compartment. I loved the challenge of slipping into a fantasy, flashback, or grand opera moment. The challenge was to find a big, broad stroke and exaggerate the color so that it looks Wagnerian, and then suddenly shift out of it and back to reality."

Operetta sound

Given a classically flavored score, typically brilliant Comden and Green lyrics, and a libretto that demands nonstop action, Jon Weston's sound design is remarkable in its clarity and transparency. He is quick to suggest that the success of the production's sound lies as much with Larry Hochman's orchestrations and Kevin Stites' musical direction as with anything he does.

Still, he admits, there are many challenges, beginning with an auditorium that contains a number of audio cul-desacs, for example, the domes in the rear that soak up sound: "There's one right next to the mix position. We moved Jason [Strangfeld, the associate sound designer and production audio engineer] as far as possible to get him out from under the dome; if he takes two steps left, he's back under it. Fortunately, the house crew couldn't be

nicer or more willing to do whatever it takes. It was a very good experience and I had a great time."

Another issue with the room: The 13-piece orchestra fits entirely in the pit, but, says Weston, "the pit is so low that we had to add stock Steeldeck platforms. The key to getting everyone into the pit, without monitoring, is to put them on different levels. It has a huge impact in what we get at the mic and how the conductor is able to hear without monitoring."

Well-chosen pieces of gear, many of them classic or legacy units, help to support the show's natural sound. Weston says that the loudspeaker rig is divided into A and B systems. The main proscenium hang consists of Meyer Sound UPA-1Cs and Tannoy CPA15s, hung in upper and lower pairs per side. "The Tannoys are for female voices and the Meyers are for the band and males. Kristin moves between the two systems." Front- and under-balcony fill is provided by EAW JF60es, with low end from d&b audiotechnik E12-Subs, E12-XSubs, and Meyer USW-1Ps.

In addition, Weston has implemented a surround system of EAW UB12s for the many train sound effects. Balcony coverage is handled by a set of JBL Control 1s on a lighting truss. "All you need is 8' of coverage, and the Control 1s are perfect for that," he notes. On-stage foldback is provided by the theatre's house set of Meyer UPM-1s. There is also some wirelessly controlled monitoring on the train, using battery-operated amplifiers with Tripath chips driving standard UB12s; when the characters are hidden behind doors, for example, they need to hear what's happening."

The actors are miked with Sennheiser MKE2s, with the standard package of Sennheiser EM 3532 receivers and

SK 5212 transmitters. Given the elaborate costumes, especially the prevalence of wigs and period hats (not to mention a chorus that changes costumes several times), finding the right mic placements could have been very tricky. But Weston says that Long's costumes "look so amazing, that's all I care about. I can work around that." In any case, the mics are rarely, if ever, visible.

The show is mixed on a Cadac J-Type console, one of the older consoles used on Broadway today. Weston says he prefers it operationally to digital consoles, with their many layers, as well as sonically. "There are no layers to switch through; it's all in front of you. As a mixer, you're not looking for something that you've heard-and therefore not paying the same level of attention to the show. With the J-Type, you can always tell what is happening, whether it is bleed or a crack or a pop, with just a guick glance around." With the analog console, he makes use of standard outboard gear, including Lexicon 480L and TC Electronic TC4000 reverbs, and BSS TSS-804s; all but the TC Electronic unit are discontinued products. The TCS is a dual time corrector. "It's just a digital delay line. These days, you can't get just a high quality digital delay line with MIDI control. They all come with other things and features and extra latency when set to 0ms. The TCS804 is 0ms through the box at 0ms. It allows for great imaging of the vocals to the actors' mouths," he says. "You can change from 6ms to 15ms seamlessly. No blip of audio at all-sustained notes aside; it is physics after all—they're getting really, really hard to find." Like everything else in *On the Twentieth Century,* the timing is exactly right.

Other key personnel on On the Twentieth Century include Scott Taylor Rollison (production stage manager), Aurora Productions (production management), Richard M. Jaris and T.J. Greenway (associate set designers); Carolyn Wong (associate lighting designer); Aaron Porter (assistant lighting designer); Daniel Lundberg (assistant sound designer); Peter Sarafin (production properties supervisor); Charlie Grieco (production sound); Glenn Merwede (production carpenter); Michael Diamond (automation); Kenny Brock and Bill Craven (flymen), Robert W. Dowling III (running properties); Jay Cohen (deck props); Barb Bartel and Michael Day (deck); Brian Maiuri (production electrician); Jay Penfield (moving light engineer); Kate Devine, Alex Husinko, and Amanda Mitchell (front light operators); Hannah Overton (assistant audio engineer); Josh Staines (deck audio engineer). Props were fabricated by Jeremy Lydic, Tom Carroll Scenery, Marcus Kearns, Atalantia Seigel, Joseph Cairo, Enhance-a-Colour, Curtis Eller, and Aron Deyo.

This is a banner year for the late Comden and Green, who are also represented on Broadway this year by the revival of *On the Town*. Thanks to the Roundabout revival, *On the Twentieth Century* proves to be a brilliant exercise in high-style screwball comedy fun.



The show curtain is a forced-perspective view of a train and powerful beams of light; the surrounding portal is a lightbox filled with LED tape.