

LIGHTING+SOUND

International



EFX AT THE MGM GRAND HOTEL, LAS VEGAS

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PLASA

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FEAR AND LIGHTING IN LAS VEGAS

Robert Halliday at the multi-million dollar EFX Spectacular

"Do you know what the most amazing thing about this show is?" asks Patrick Seeley, production manager for 'EFX', the epic theatrical show playing in one of the theatres at the largest hotel in the world - Las Vegas's MGM Grand. My mind reels. The \$40 million production budget? The 11-month long technical rehearsal? The 70-strong cast, 70-strong crew? The 102 tons of stage scenery? The 85 tons of flown scenery and lighting? The 300 speakers? The 3000 dimmers? 2500 lanterns? 336 moving lights? 2700 amp three-phase power supply needed to make just the automation work??

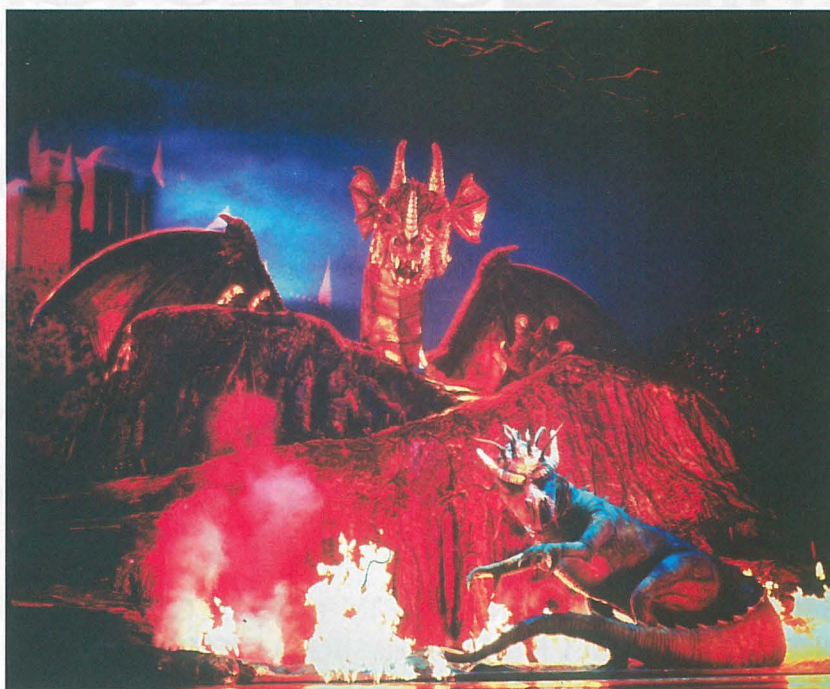
"It's that there are actually some things we said 'no' to!" Seeley finishes.

It's hard to imagine what. EFX is the ultimate example of theatre spectacle run wild, and the epoch of the incredible rivalry that has broken out between Las Vegas' new power-brokers. Not content with trying to build the biggest or most impressive looking hotels (the result of which is probably a draw at the moment: MGM is the biggest, Treasure Island with its hourly pirate battle outside its front door is the most impressive), the owners have also been competing on the entertainment they can offer inside their establishments. In the past this would have involved just finding a big name star and dropping them into a nightly girls 'n' feathers show; elements of this 'Old Vegas' mentality still cling on in some parts of the town, especially where, as with Debbie Reynolds, the stars have also become the hotel proprietors.

But this is the nineties; the caring, sharing 'new Vegas' desperate to appeal to a family audience, rather than the hard-drinking lone gambler. Theatrical-type spectacles are what's called for. And, strangely, most of what's now on show in Vegas can be traced back to a West End musical that, at the time, was considered to have been something of a flop.

That show was Dave Clark's 'Time'. Technically, a seminal piece: plot out of the window, but an epic John Napier set, Andrew Bridge let loose with Vari*Lites in the West End for the first time, and sound that literally shook the building from Jonathan Deans. Magicians Siegfried and Roy saw the show, liked it, and transported the entire production team to Vegas to create a permanent show at the then-new Mirage Hotel. New Vegas had begun. The race was on. In a bizarre twist (given that it actually pre-dates Time in terms of effects over plot), the Hilton brought in a permanent version of 'Starlight Express'. Then came Cirque du Soleil's 'Mystere' at Treasure Island. And so to EFX.

MGM were building the biggest hotel in the world. That hotel had a theatre - or 'showroom' as they're still known in the town. It needed to be filled and, for the biggest hotel, it obviously had to be filled with the biggest show. In a nod



The wizards duel from 'Merlin, great master of Magic'.

to the 'old Vegas', that show was to be based around a star - Michael Crawford. In the UK, Frank Spencer seems like an alarming choice to front the most technically complex stage show in history, but Crawford is also a stage performer of note who America has taken to its collective heart for his portrayal of the disfigured 'Phantom of the Opera'. It's unclear what the instructions then were, but they must have been something along the lines of "go write a spectacular show".

The result, as conceived and written by Gary Goddard, Tony Christopher and the Landmark Entertainment Group, with music by Don Grady, takes Michael Crawford as the 'EFX Master' through four principal scenes: medieval times where he turns himself into Merlin and fights the evil witch Morgana and her dragons, a futuristic circus where he becomes a descendant of PT Barnum, the spirit world where he becomes the death-defying Harry Houdini, and a final transformation into H.G. Wells, travelling from London through a 3D film to a pre-historic canyon full of scantily clad slaves. This may be the new Vegas, but you still have to have something to please the old Vegas crowd...

That script was then turned over to a production team with a very strong track record: director Scott Faris, British choreographer Anthony Van Laast, designer David Mitchell (a double Tony award winner with Broadway shows such as 'Annie', 'Barnum' and 'La Cage Aux Folles' to his name), costume designer Theoni Aldredge (three times Tony award winner and responsible for more Broadway shows than any other designer in theatre history), lighting designer Natasha Katz (Tony award nominated for Disney's stage version of 'Beauty and the Beast', and with other work spanning the musical 'My Fair Lady' to the premiere of 'The Normal Heart') and - in a strange nod to the show that begat it, sound designer Jonathan Deans (of Time fame, as well as Siegfried and Roy and Mystere in Las Vegas and 'Damn Yankees' on Broadway). With

technology set to play an important part in the show, Jeremiah Harris and his production company, Harris Production Services, came in as associate producers, bringing in subsidiary ECTS Scenic Technology (now Scenic Technologies) as the principal set construction and automation company.

SET AND EFFECTS

This is where Patrick Seeley became involved. On joining the then relatively-new Las Vegas operation of Scenic Technologies, he recalls being told "here's this thing called EFX. See you in a couple of years."

At first glance, the problems can't have seemed that daunting. OK, so David Mitchell was designing a lot of scenery, with a completely different look for every scene in the show and for the linking scenes, but there was

a lot of space to put it in: the stage is 196 x 115 feet, with a 108 x 32 foot proscenium arch and has large wings and storage areas on either side. But the theatre had been designed and built before EFX came along. "It was actually built before there was even an entertainments department at the hotel," Seeley recalls, "and this led to all sorts of problems. At some point the power transformer for the theatre was cut because there was no-one around to say 'actually, we need that'. So the electricity supply is now very strange, with some of it coming from the hotel and some from the casino. Similarly, all the hanging facilities were very under-rated."

So, although the theatre had actually been operating for a few months before EFX moved in, principally staging concerts, the production team had to "start knocking it about to make it take the show". And not just the stage area: Mitchell's set design spills round onto - and in a couple of places even through - the side walls of the auditorium, which are themselves painted to become part of the set. The auditorium was re-modelled and re-coloured to suit the show, with the roof altered to ensure that, apart from the front truss, the copious amounts of front-of-house lighting are hidden from view.

The huge amount of scenery that the show demanded meant that, despite the large stage, space was still at a premium. The heavy flying pieces demanded automation, but their positioning - often within inches of each other - led to problems locating the motors. "In the end our engineers came up with an ingenious solution that now seems very simple," Seeley recalls. "They adapted our standard drive motors so that they could be mounted in a variety of ways, with the pulleys set on either side. We'll have, for example, one motor one way up on the floor and another motor hanging with the pulleys on the other side. Though the motors still have the spacing they need, the cables to the pieces are just inches apart."

Scenery doesn't just fly, though. Some of it tracks - though the number of tracks are limited

and, in a manner now familiar on many West End shows, a crew are kept busy in the wings changing scenery over and flying the unused scenery out of the way on storage winches. And some sections - notably the two huge animatronic dragons - rise from the floor, using a stage lift installed as part of the theatre's original specification. The sub-stage area is actually two storeys deep, and scenery change-overs also take place down here during the course of the show.

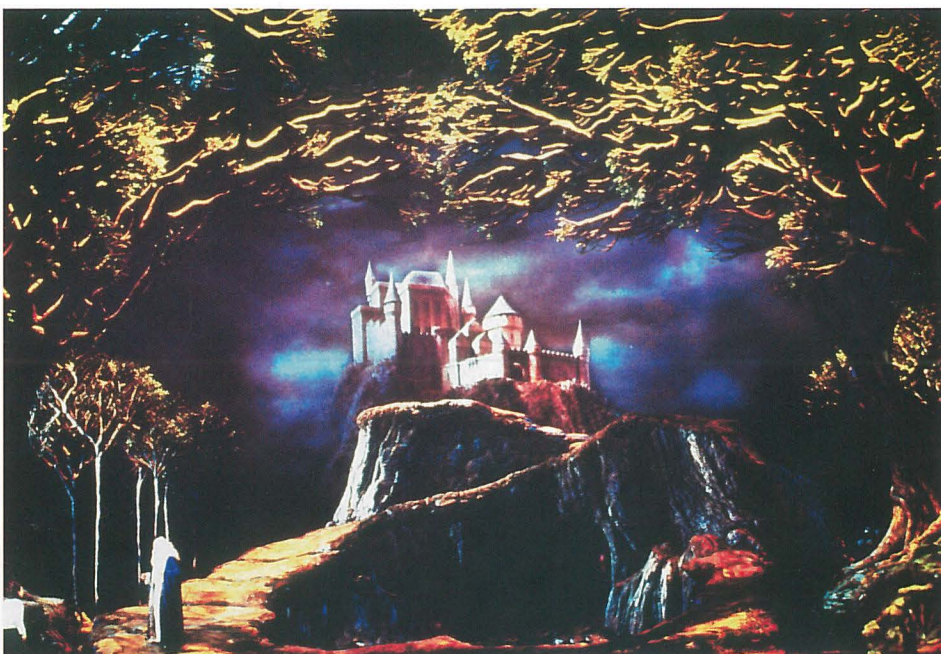
The show's automation is also controlled from the basement, with five operators each running one of Scenic Technologies' scenery control computers while looking at two screens that are switchable between 14 cameras. The control system - which Seeley believes to be the biggest in any theatre - has triple redundancy; each computer has a backup, and if that also fails, the operators can access the movement systems directly. Some supplementary controls are located elsewhere to reduce cable runs - the dragon operators actually sit in the dragon truck, for example.

Seeley actually feels that, demanding though fitting all of the scenery in and getting the automation working was, these weren't actually his greatest challenge. Instead, it was "having to co-ordinate people from so many different areas of the industry - theatre people, theme park people, animatronic people and so on. The animatronic people, for example, would say 'what do you mean it has to roll up and down the stage' and not get it at all. Then they would finally get to the theatre and see what we meant, and suddenly they'd understand why we'd insisted on quick-release connectors". And there were sometimes even problems with the people who were familiar with the theatrical environment - mainly in finding enough of them. "Crews for Vegas shows have traditionally come from Vegas," he explains, "but because there are now so many shows in town, and they're becoming more complex, we're running out of good local people. During the production period we were drafting in people from all over the place - during the dark weeks on Phantom or Tommy tours, it'd be 'right, now you're going to Vegas!'"

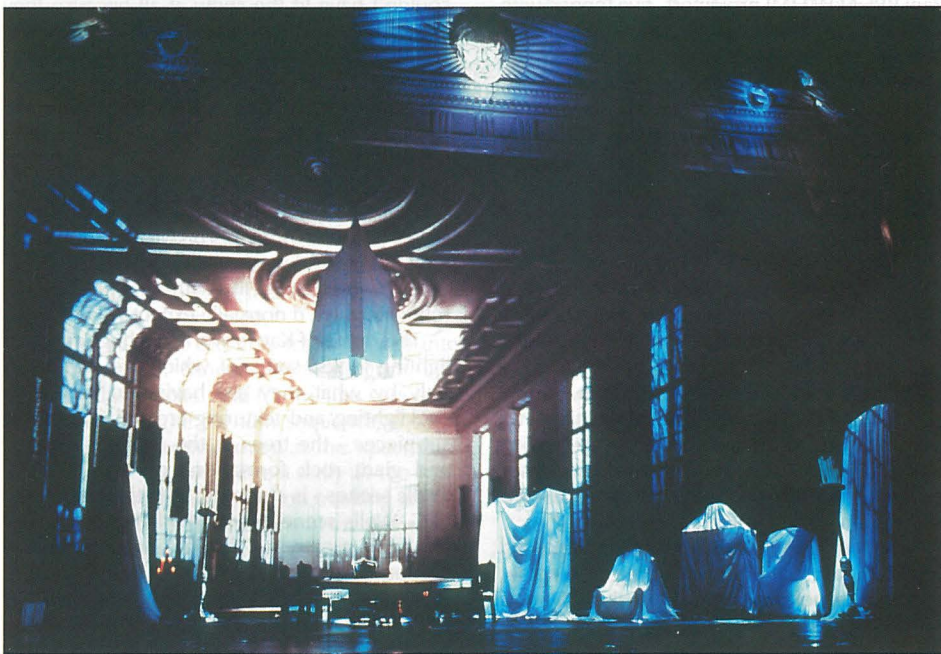
He also had some unusual requirements to deal with because of the vast array of effects in the show, ranging from the liquid nitrogen fog curtains that span the full width of the proscenium arch and are fed from a tank outside the building, to the pyrotechnics and the gas supplies to the fire-breathing dragons. And, one year after it opened, he's still monitoring and working on the show, helping to rationalise some of the excesses that crept in during the fraught production period.

LIGHTING

In the October 95 issue of L+SI, in the piece about the 'Les Miserables' tenth anniversary concert, there was a comment about the lighting rig and its 115 Vari*Lites, a number that was "something theatre can only dream of". EFX is, of course, the exception. To help her cover the huge stage area and the multitude of scenery it contains, lighting designer Natasha Katz specified a rig of 215 Vari*Lites (a mixture of VL2Cs and VL4s, with a handful of VL5s thrown in for good measure). Oh, and 84 Cyberlights and 32 Intellabeams. And 60 of DHA's Digital Light Curtains. And, to back all of that up, a conventional rig of over 2000 lanterns, 400 of which were topped with Wybron scrollers. And that's before counting the effects, which included 12 RDS projectors, four 70kW lighting strike strobe units and eight



Pani projectors from Production Arts, coupled with Cyberlights, create a magical setting.



The illusory world of Harry Houdini conjures forth spirits in an English country house.



Slave Dance - part of the H.G. Wells tableau.



One of the pre-historic creatures from the wizard's duel from H. G. Wells.

Pani BP6 6kW HMI projectors, five topped with Pani's AS100 image scrollers. The Panis were supplied by Production Arts, who even created custom rotators for four of the image scrollers, to allow the image to move horizontally or vertically. The conventional rig is controlled from ETC Sensor dimmers which feature a fault-reporting system.

Katz specified the rig by working out the kind of looks and effects she would need, then specifying the equipment that would generate those effects. "I've used Vari*Lites for years, and will continue to do so," she explains, "but there are certain things they can't do, like rotating gobos or cross-fading colours in the 2Cs. We knew we'd need some of those things, so that led us to the Cyberlights." The conventional rig was then added to fill in around the moving lights. "The scrolls, for example, contain mostly pale tints, the kind of colour that it is quite hard to get out of moving lights."

She then had to fight the usual battle to find space to put the lights. Getting the rig in, though, was nothing compared to the problems of lighting the show. "The first week in the theatre was really just spent getting our sea legs," Katz recalls, "because the size of the stage meant having to think about things in different ways: you'd put up a sidelight wash and it would have no real effect." There was also the problem of co-ordinating all of the different lighting systems - an Obsession 3000 controlling the conventional rig, the Obsession operator also running a Macintosh for the DLCs, a Vari*Lite Artisan programmed by CD Simpson and a Compulite Animator running the moving mirror lights programmed by Paul Turner. Much of that co-ordination was handled by Katz's associate, Ted Mather, and assistants Eric Cornwell and Gregory Cohen. This has led to a situation, unimaginable a few years ago when Vari*Lites were only just affordable and their use had to be carefully rationed to specials, where they are used for much of the show providing general cover, with the Cyberlights and Intellabeams adding specials, such as rotating gobos or moving clouds. The Vari*Lites do still rule in the Houdini sequence, though: here Katz did succeed in closing the lighting down to very tight, specific areas and the VLs provide a series of isolated specials for Michael Crawford to walk through. However, Katz also sings the praises of the DLCs: "Without them, we

couldn't have lit the show at all because they provide all of the toning and backlight. By being able to position them, we could get highlights to specific parts of scenery."

The biggest problem with plotting tended not to be when something worked, but when it didn't. "With so many lights, the time to programme anything was enormous." Storyboards of the lighting were produced to help try to overcome this problem, but even so Katz still considers the show to be "probably only three-quarters lit, without much of the refinement we'd normally expect."

The result of Katz's work is a huge range of lighting looks, some of which are hampered only by what they are having to light. The backlighting and texturing created for the big set-pieces - the trees in the Merlin sequence and giant rock formations during the H.G. Wells scenes - is stunning, as is the start of the H.G. Wells scene, where the lighting plays off the 'look' created by the Pani projections. The Barnum sequence is less impressive because there is little scenery and a stage full of performers who have to be lit, so the lighting just shows the stage up as the enormous empty space it is. However, the Houdini act that follows is a triumph, because the lighting is held down to tight, white areas and manages to pull the audiences' eyes into specific places even on that huge stage. The most effective 'trick' in the show is in this scene, when five seated figures suddenly fly backwards through the air into darkness - proving yet again that 'dark' is as important a weapon in the lighting designer's arsenal as 'light'!

SOUND

Ask sound designer Jonathan Deans what it was like to work on the most expensive theatre production ever, and it's immediately clear that the show wasn't quite as out-of-control as it sometimes seems. "Even on a Vegas show there are still budgets! EFX is supposed to be the biggest budget there is, but it's in scenery." He pauses to reflect on the show, before adding: "if they gave me that kind of money, they wouldn't need the scenery..."

Even with the budget available, the project was so large that Deans brought in his Cirque du Soleil colleague François Bergeron as associate sound designer. Between them and their company Real Time Audio, they were responsible for every single item connected

with sound on the show - from the effects down to the installation of the last piece of cable. And that means that the men were more-or-less in charge of everything an audience hears, since all of the music and big chorus vocals in the show are pre-recorded and all of the principal's singing is fed through Sennheiser radio microphones.

The resulting sound rig is in proportion to the rest of the show: 300 loudspeakers driven by 85kW of Crest amplification in total, including EAW850s on either side of the pros arch, 24 EAW300s across the ceiling as a surround-sound system, 18 groups of delay speakers, and 136 sub-woofers built into the front rows of audience seating. Other subwoofers and speakers are built into many of the other scenic pieces, the aim being to allow sounds to appear from as close to their visual source as possible.

To achieve routing of this complexity, Deans and Bergeron take sound from the 48-channel Yamaha PM4000 mixer into a 64-output Level Control Systems console. This can either route sound to one particular output, or fade it around the outputs to create moving sound effects - the path an effect takes being easy to set up using the LCS 'Spacemap' system, that allows sound routes to be drawn on-screen with the system's Macintosh then working out the appropriate fades.

The LCS also triggers the rest of the sound system via MIDI, allowing the settings of the 32 BSS Varicurve parametric equalisers and 27 BSS TCS-804 digital delays to be altered during the show. Global changes are made for the different scenes in the shows, but Deans also makes use of the LCS 'vocal focal' system to alter the delays so that the sound appears to track the performer it is originating from, helping to ensure that the audience are watching the right person.

MIDI is also used to fire the Doremi Labs DAWN effects system, which stores the show's music and sound effects on 16 tracks occupying 16Gb of hard drive space, with a second system running as a 'live backup' that can be switched in immediately if one system fails. Hard drives were used because Deans "wanted to be able to play back up to 16 tracks individually with digital quality, and because we needed to have instant start-up and to be able to change things easily." This last was probably the most important factor: composer Don Grady was working on site with a synthesiser and then, when enough music had been composed, flew to London to record it with the Sinfonia of London orchestra. Those 48-track recordings were eventually mixed down to the 16 tracks on the DAWN hard drives, allowing the soundtrack to be mixed to best suit the auditorium.

At the same time, Deans, Bergeron, assistant Todd Meier and operator Mark Dennis had to create the many sound effects the show demanded, using a Pro Tools studio set up in the theatre. "We all had different rooms," Deans recalls, "so it became 'I'm going to work on sound effects today' or 'let's go and work on the stage'." It was a long production period, but we were working with good people and so could still be creative."

Even with occasional distractions, Deans and Bergeron have done a superb job on the show. Deans noted that the main challenge facing a modern sound designer is to match the quality that people hear from CDs at home and, for the most part, he has achieved that with EFX. The sound effects throughout the show are excellent, and the overall sound quality is superb. Many of the audience leave convinced

that the whole show has been lip-synched to pre-recorded vocal tracks. Fortunately, Deans takes that as a complement . . .

CONTROL

Of course, it's no good having all of these expensive toys if they can't work together. The EFX team could have followed the theme-park route, where one master console generates time-code and everything else follows. But they didn't, partly for practical reasons (in the show's early days many elements were run manually, and only added to show control as they were proven to work), partly to try to keep a 'live' feel to the show, partly because different sections of the show are 'led' by different departments - and also because, as Patrick Seeley wryly notes, "we still have to have people so that if the 'intelligent' lights misbehave, there's someone around to turn them off."

"Unlike many Vegas shows, EFX still has a show caller, who has ultimate responsibility for the show," Seeley explains. The show also has a show control department, but its role varies from cue to cue using a complex system devised by Scenic Technologies. The dragon cues, for example, are automation led - once the dragons are in position, automation signal show control, who start sending timecode to every other department. Those departments can then use the timecode as they need to - sound, for example, is converted into MIDI that triggers the DAWN hard drives and LCS system. Conversely, at the start of songs, sound can send MIDI information to the show control system, which starts timecode for the other departments.

Some cues are even actor-triggered, with performers pressing switches to arm and then fire pyrotechnics - though these triggers also pass through override switches held by technicians on either side of the stage, and can also be overridden by the air quality sensors ensuring that the pyrotechnics and flame effects are disabled if, for example, a gas leak is detected. Triggers that do get through all of the safety systems also send MIDI show control messages back to Show Control and on to sound, so that a sound effect coincides with the on-stage flash.

IN PERFORMANCE

And the overall result? Hmm. I think the audience's reaction says it best; they pay \$70 for a ticket, but are not quite sure why they should come and see the show, but admit to being seduced by the heavy advertising emphasising the show's spectacle and its incredible statistics. They arrive, take their seats. Some may notice the pre-show sequence, a long segue of moving projected



Michael Crawford as the 'EFX Master'.

images and gently changing soundscapes and audience lighting that tell a story all their own. The show starts with a giant projection head appearing, an effect that is a clear homage to Laurence Olivier's contribution to Time, but the view from many of the expensive seats is interrupted by ushers bringing in latecomers and waiters delivering the drinks that are included in the price of the ticket.

The nitrogen fog curtains come on: a stunning looking effect, but the temperature in the auditorium plummets as the air conditioning fails to cope. The audience reach for their coats. Michael Crawford rides up and down through this fog on his 'flying saucer' crane - occasionally vanishing completely, as do the first few rows of seating as the fog rolls over the front of the stage.

Muted gasps at the first scene change into Merlin's world. More for the dragons and shooting laser bolts. And for the film sequence that leads into the Barnum sequence, though this turns to disappointment as the 'spaceship' shown in the film turns into a sadly all-too-real, flat, cardboard-looking version tracking across stage. Then the biggest laughs in the show as a front-cloth comes in, leaving Crawford to what is basically an effect-free one man stand-up act taking the mickey out of the rest of the Vegas shows.

On to Houdini. Gasps as the seated figures attempting to contact the spirit world suddenly launch backwards through the air; possibly the best effect in the show. Then Houdini escapes from the water tank. No surprise there.

And so to H.G. Wells in his London study, the location set by a magnificent projected image of London. This leads into the 3D film time-travel sequence - which the audience have

known is coming from the 3D glasses tucked into their programmes. As soon as the H.G. Wells scene starts, most of them don the glasses even though the film doesn't start for another few minutes. They look ridiculous, and only Crawford's humour as he informs us it is now time to put the glasses on - adding that those who already have won't have found him looking any better - makes it seem less silly. After the film comes the slave dance, with the scantily clad chorus girls to keep dads happy, followed by a dramatic chase over collapsing rock faces, made to seem more ridiculous as people pause to clip into safety harnesses.

Then the finale. Then the audience clap. Briefly. But even as the cast re-group on stage for the curtain calls, the applause is going embarrassingly quiet. It takes some time to cycle through 70 performers, and the applause seems strained throughout. No-one is sure that this was \$70 well spent. Hell, that could have given them another half hour at the tables in the casino outside. And they might then have left wealthy, rather than chilly and bemused.

It's a shame, because \$40 million could have produced a lot of new, 'straight' musicals that might actually have had more emotional effect on an audience. But that's not the Vegas way.

This is not intended to belittle the work of the technical people - two pages' worth of names in the programme, set in very small type! - who got the show on. Technically, it is a stunning achievement. But it is not a stunning show; it goes nowhere. It's trying to be a musical, but it has no story, no 'beginning/middle/end,' no emotion. Even 'Starlight Express' has a story, of sorts. That's the difference, and that's why it has no real effect on its audience. In the West End or on Broadway falling ticket sales might by now have led to its closure - but the Vegas way doesn't allow tickets to be bought more than a few days before a performance, thus preserving its image as a must-see smash hit.

In the meantime, it's given work to plenty of people and companies, allowed Scenic Technologies to expand beyond the East Coast, allowed Harris Production Services to buy Vanco. Every cloud has a silver lining. If you happen to find yourself in Vegas and want to see a good show, go see 'Mystere'. And if you can't afford that, just go for a walk; watch the erupting volcano outside the Mirage hotel, the Pirates at the Treasure Island hotel or the stunning scrolling billboard-come-arched-roof over the renovated Fremont Street. Vegas calls itself the entertainment capital of the world and when much of that entertainment is free, EFX just seems like \$70 too much. Trouble is, more new hotels are being built. And someone is going to feel the need to out-spectacle EFX, whatever the cost . . .

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