Theatre: The Closest Art to Science

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It has been said that the Arts and Sciences are the "Janus faces" of society. At one point in history, this may have been true. Now, however, the scientific and artistic communities rely upon each other in a symbiotic ballet of technology and style.

Theatre—the whole process of making live performance before an audience, as opposed to theater, the building in which this happens—has always relied upon the conventions of modern science to better its presentations to the audiences around the globe. As inventions such as the gas lantern, gear winch, and even the telephone system were invented, the theatre community utilized new technologies to further the experience of attending a performance.

Standin' in the Spotlight

The theatrical lighting industry is probably the sector of theatre to work the closest with scientists for development of new technologies. As the development of the computer has evolved in past years, so has its use by the lighting community to simplify tasks that are normally cumbersome. In her 2002 book, "The Speed of Light," Linda Essig, a professional lighting designer, discusses how the evolution of computer-controlled theatrical lighting has shaped the theatrical industry into what it is now.

Lighting is a very important element of modern theatre. As directors seek to further control isolation, mood, special effects and realism, more demand is being placed on the theatrical lighting industry to develop products to meet the needs of the

production. In the early eighties, a new invention that hit the market changed the way we see things on stage. The Intelligent "Moving-Light," first developed to give dramatic lighting to concerts, has become a standard in modern lighting repertoires. With this marvel of technology, one lighting fixture can easily do the job of many others by being able to move, shape, and color its beam of light without being manually refocused. Teams of engineers, computer programmers, lighting designers, and technicians at companies such as Vari*Lite International work to constantly update these workhorse fixtures to meet the demands of today's lighting designers.

With new "non-conventional" fixtures entering the market, a need for better control arises. With the development of DMX512, the universal data language of theatrical technology, came a new way of controlling dimmers, effects, and other lighting equipment. Before, each dimmer had an individual control signal cable running from the control board to the dimmer pack. This obviously led to cumbersome bundles of cable running everywhere, which worsened as the number of dimmers increased. Now, using the digital language originally developed by the telephone industry, a lighting designer can control up to 512 individual dimmers by running one cable no larger than a microphone cord. Using a digital language also allows room for easier control by computers, allowing more time for actual design.

As the theatre industry raises its demand for better, safer lighting instruments, the scientific community responds using their expertise in optics, thermodynamics and electronics. Newer fixtures now use less power, emit less heat, and are brighter than ever before. The result: more lights, more control, more design.

Glitter and Sequins

Another large part of the theatrical experience is taken up by the costuming. Clothing the actor is no easy task, especially when the show takes place in a time period far in the past, or even the future. Costumers are constantly looking for innovative ways to clothe performers correctly, and inexpensively. This is where the scientific textile industry comes into play. New fabrics, dyes and other materials help the costume designer, and his or her staff, effectively costume a show. For example, we often choose to perform plays that are set in Victorian style. The clothing from this period was often bulky, made of wool, and very hot. On the stage, with the amount of energy required from an actor, compounded with the heat of the lights and movement, using actual garments made in the traditional way is almost impossible. Textile companies such as Rose Brand, Inc. seek to develop new fabrics that look authentic, but allow more comfort. This cuts down on the amount of heat exhaustion, a common problem on the stage.

The Scenic Route

Theatrical scenery can range from the realistic to the obscure. Especially in modern theater, we seek to build scenery that is lightweight, portable, and most of all realistic looking. The scenic designer often has pieces of scenery moving on and off stage by flying into the air, "tracking" across the stage, or sometimes spinning. For this reason, we hardly ever build scenery out of traditional building materials. Theatrical scenery is often made from urethane foam, steel supports, lightweight "lauan" wood, and canvas. These materials allow scenery to be lighter and more easily moved. For example, if one wanted to have a sixty foot brick wall on stage and have it disappear in 10 seconds, one

would not build said wall out of brick. Such a wall would weigh several tons. A realistically painted piece of foam of the same size would weigh approximately 100 pounds.

After a set is constructed, it must be painted. New scenic paints have evolved over the last hundred years, making sets more realistic, durable, and colorful. The new scenic paints developed by companies such as Rosco are much more durable, soluble, and pigmented than standard wall paint. These paints allow designers to achieve perfect coloration and aid in special effects created by painted illusions.

A recent stride by the chemical industry was the creation of Transparent Ultraviolet Responsive Paint (TURP). This mixable paint, available in many hues, can be used over an already-painted backdrop. Under normal stage light, what was originally painted on the backdrop is all that is seen by the audience. When the light is switched to ultraviolet, the new paint takes over, and becomes visible. This allows for a sudden, complete change of scenery not easily accomplished before.

Scientific Fact

Theatre and science are fields that may appear different, but actually have deeply rooted ties. In fact, there are many professionals and organizations around the world that seek to unite the forces of these two industries to invent a whole new kind of entertainment. One such organization is the United States Institute of Theatrical Technology (USITT). This organization seeks to keep its membership, comprised of theatre students, designers, technicians, scientists and engineers, updated and educated about new scientific, and technological, advances and standards that may aid in the

process of staging a production. USITT holds conferences and a yearly exposition that showcases new developments in theatrical technology, and offers training sessions for the use of new conventions.

Despite obvious differences, theatre and science are not any further apart than life in general and science. As in politics, there will still remain people who are partisans of one side or the other, emotionalism versus rationality in an endless and pointless prizefight. A new generation of professionals is coming out, however, and they believe that the two sides of the brain have united—art and science now work hand-in-hand to better our way of life, which is the goal of both endeavors.

Sources

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Rosco USA. http://www.rosco.com/main.html

Rose Brand. http://www.rosebrand.com

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