

“Better living through chemistry” is a cliché of cold war culture that illustrates the ambiguous place held by technology in the collective psyche of the 1950’s. For the film world, “better living through optics” was more apt. Anxiety and fascination about technology pervaded rhetoric of the nuclear age: the Los Angeles Times, for instance, sounded the alarm that Hollywood was fighting a “war of scopes and shapes.”¹ The press subtly romanticized the situation of competing widescreen formats as a “race” to dominate an unconquered (if not uncharted) technological frontier, in which standardization of one single format would be microcosmically tantamount to a moon landing. According to the press, the competition hinged on the ever-escalating technical wizardry of the various formats; greatest bombast, they assumed, would translate into greatest box office. However, this was not the case.

Touted as transcendental by fans and gimmicky by skeptics, the brand-name widescreen formats—Cinerama, CinemaScope, and Todd-AO—ascended to the forefront of film culture in the immediate postwar years, and then disappeared completely. In his own image, showman Mike Todd created the most ostentatious of these systems, Todd-AO. The first company to ever turn a profit using wide-gauge film, Todd-AO was known as “the hallmark of quality.”² Yet somehow, only two movies were shot and shown in the original process, and a mere baker’s dozen (mostly musicals) were released in modified forms. Todd-AO was a leader in its field, but at too great a price: its demise plainly demonstrates how cost-effectiveness, not technological progress, determines the course of film history.

The Shape of Money?³

The scholarship on wide film, along with public consensus, holds that the wider the film stock, the better the picture. Large screens, especially those of the great urban movie palaces, required more light for a sharp, steady image. With an aperture four

times the size of a regular projector, 70mm film is magnified at a rate five times less than that of 35mm, resulting in an image of stunning clarity.⁴

Explaining Thomas Edison and William Dickson's choice of thirty-five millimeters width for the celluloid strip (in hindsight less than optimal) Robert Carr and R.M. Hayes remind us that Edison's general business philosophy was to "do no more than is necessary to make a buck."⁵ This is a convenient way of summing up the film industry's position, too. When wide film experiments unraveled disastrously in 1929, individuals truly concerned about improving the film industry for integrity's sake were vastly outnumbered by hardboiled realists.⁶ In spite of the self-congratulatory myths emerging from Hollywood since its inception, film technology has never aspired to a linear course from the primitive to the perfect. The high expense of wide-gauge production hampered its arrival in the 1930's and hastened its departure in the 1960's.

Opportunity Narrows

A surprising number of wide film systems came out of the major studios in the transition-to-sound era. In 1929-30, RKO, Warner Brothers, United Artists, M-G-M, Paramount and Fox all designed new cameras and projectors and came up with catchy names (VitaScope, Natural-Vision, RealLife, Grandeur, etc) for their products, which ranged from 56 to 70mm wide.⁷ Unfortunately, the stock market crash of October 1929 sealed the fate of these investments.⁸ Fewer than twenty theaters around the country were ever converted for wide wide-film projection. While expanding the size of celluloid during the sound era made sense (because the added soundtrack on 35mm diminished the frame size and skewed the aspect ratio), audiences had to adjust to a narrowed image for the next twenty years.⁹

Hollywood studios found themselves in hot water in 1948, when the United States Supreme Court brought an antitrust suit against the five largest Hollywood studios. In *U.S. v. Paramount Pictures, et al*, the five largest studios were forced to dismantle their

vertically integrated systems of production and distribution.¹⁰ Treacherous domino effects ensued. Because block booking was outlawed, double-feature programming drastically declined, and with it the production sector as a whole.¹¹ With fewer movies available the industry knew audiences would scrutinize each product more closely. This became a rationale for boosting production values. The amplified demand for investment capital, coupled with the upheaval in the studios, led to the rise of the independent producer.¹²

The Paramount Case was just one of the dizzying circumstances Hollywood confronted in the immediate postwar period. The spoils of war created fertile ground for investment, innovation, and implementation of military-related technological advances. Yet with this new prosperity came new tension, as the growing suburban middle class became more and more finicky about leisure time activities. The postwar spending boom was motivated by increases in middle class incomes and education as well as a sudden influx of products that had been scarce or unavailable during wartime. Widescreen cinema historian John Belton explains that in this period, 1950's "the kinds of films being made changed...as the composition of the moviegoing audience shifted [away] from an ill-defined and somewhat amorphous general audience" to a more educated, age-stratified and discerning public. This new audience, according to Belton, preferred active, participatory recreation over passive entertainment, as evidenced by the popularity of Disneyland (which would open in the same year as *Oklahoma!*) and drive-ins.¹³ Widescreen would be aggressively marketed as an experience in which spectators played a part.

The explosive growth of television caused a product-differentiation crisis for the film industry.¹⁴ In 1946, less than one percent of American households had TV sets. By 1954 that number had grown to around fifty-six percent; suddenly, more than half of all American families were consuming moving images for free in the comfort of their living

rooms.¹⁵ Moreover, suburbanization drew the middle class further and further away from movie houses in city centers. With the exception of drive-ins (far cheaper to build and maintain than regular theaters), most exhibitors couldn't afford to follow their audiences to Levittown.¹⁶ Metropolitan theater owners experienced increasing pressure to make moviegoing demonstrably "worth the trip."

So, what could the A-bomb possibly have to do with the musical *Can-Can*? In the 1940's, the U.S. military allocated a generous slice of its budget to motion picture and optical research. While CinemaScope's anamorphic lenses were based on the tank periscopes (WWI technology), Cinerama engineer Fred Waller devised a multiple-projection widescreen for the Air Force. According to Thomas Erffmeyer, the "Waller Flexible Gunnery Trainer" prepared several thousand soldiers in the US and in England for in-flight combat. (Waller reported receiving dozens of eager letters from trainees: "When are we going to see regular pictures like this?")¹⁷ Todd-AO's technical expert, Brian O'Brien, received the Presidential Medal for Merit for his contributions to the National Defense Research Committee between 1940 and 1946.¹⁸ O'Brien developed night-vision devices for soldiers, as well as an ultra-high-speed motion picture camera (10 million frames per second) used to film test explosions of the atomic bomb.¹⁹ Clearly, war-related advancements in motion picture technology inspired creative thinking about optics and visual experience. In a short time, entrepreneurs would push "high-tech" spectatorship to the cinema audiences as a new kind of participatory recreation.

Scopes, Shapes and High Society

Each of the major competing panoramic formats of the 50's had a different technique: multiple-projection (Cinerama), wide frame (Vista-Vision), wide film (Todd-AO) and Anamorphic lens photography (CinemaScope). While certain ingredients of Cinerama (the curved screen, the sound system, and use of wide-angle photography) would all be replicated in various ways by subsequent pioneers into widescreen,

Cinerama is the only widescreen format that is fully “extinct” in exhibition practice today. Leo Enticknap points out that Vista-Vision’s horizontally-printed 35mm lasted only a short time, but the idea of horizontal film would later be used in IMAX and its derivatives; the 70mm film gauge of Todd-AO still retains a niche market for high-quality imaging and special effects; finally, the 35mm anamorphic format remains the “accounts for 1/3 to 1/2 of all leisure films produced in western world today” and can be viewed nearly all American theaters.²⁰

In the traditional model, features were distributed by studios to hundreds of movie theaters around the country for a run of two or three days.²¹ Widescreen distribution was considerably more complicated. As John Belton points out, the marketing strategies for the independently-produced Cinerama and Todd-AO are quite different than Fox’s for CinemaScope. The latter sought to saturate the mass market while Cinerama and Todd-AO pursued the class market, through roadshowing.²²

Roadshows were exclusive engagements, running for several months at a time in key theaters in major cities. This was necessary for two reasons. First, equipping theaters for Cinerama and Todd-AO was costly and semi-permanent, and second, (unlike Fox) the producers were outside the distribution loop.²³ Furthermore, by debuting in legitimate Broadway theaters, roadshows were designed to appeal to an “elite audience of traditional theatergoers.”²⁴ Cinerama opened in 1952 at the Broadway Theater, just below 53rd Street in Manhattan.²⁵ Cinerama’s developers, Fred Waller and Lowell Thomas, hired Mike Todd to serve as the executive producer or “front man” of Cinerama.²⁶ Todd, a man with little use for euphemisms, explained the logic or roadshowing this way:

Make believe you got round actors and sell hard tickets...the carriage trade will swim a river of crocodiles to see it. To show they’ve got class and appreciate the arts, they’d be insulted if you didn’t charge premium prices and make it a little hard

to see. This way they don't have to rub elbows with the gum chewers...if you get the reviews, the gum chewers will figure out how to get in as well. Once you hit New York, You'll have to fight the out-of-town exhibitors off with a stick.²⁷

Cinerama's success demonstrated that people were willing to shell out extra money for extra screen.

A High-flying Roustabout

Todd believed that, if sufficiently improved, widescreen had the potential to fuse the spectacular views of Cinerama's travelogues with narrative filmmaking of 35mm variety. He regularly brought suggestions to Cinerama's board of directors concerning the system's technical flaws, and was regularly ignored. After shooting half the footage for *This is Cinerama!*, Todd left the company, seething, soon after the film debuted in September 1952.²⁸ His intent was revenge. He resolved to solve all of Cinerama's problems (edge distortion, blend lines and mismatching color temperatures between panels, and the immobility of the camera) and to package the system anew.²⁹ In short, he wanted a system in which "everything comes out of one hole."³⁰

For all the effort this man expended cultivating a personal mythology, it comes as no surprise that Mike Todd is a pseudonym. His real name was Avrom Hirsch Goldbogen. Mike Todd was the essence of theatricality. He became famous as a stage producer from the late thirties until he went to work for Cinerama in 1950 and was known for spectacular gimmicks (revolving stages, waterfalls, gondoliers, pyrotechnics) and for hyperbolic speech ("I made more money out of Hamlet than Shakespeare did!")³¹ Later in his life he envisioned himself as a sort of showbiz-diplomat—he hand-delivered a print of *Around The World in 80 Days* to Russian Culture Minister N.A. Mikhailov, a whole year before Nixon toted washing machines to Khrushchev.³²

Avrom Hirsch Goldbogen's life began on a mysterious note (he never revealed his birth date) and ended on a doubly ironic one. Known for his compulsion for jet-setting, he died in the crash of his custom-made Lockheed Lodestar, named *The Liz* after his famous third wife.³³ To add to the irony, Todd's official biographer, Art Cohn, went right down with him, precluding the official version of his full life story from ever going to press. The crash was front-page news; as the Los Angeles Times described him,

...he was a dice hustler, carnival roustabout, trustee of a bricklaying academy, bankruptcy sale major domo, building contractor, movie studio soundproofing, plunger on the horses on cards, bankrupt and Broadway and Hollywood producer. He made and lost his first million before he was 20 years old. Words stumbled out of him in a fast staccato beat. He was virtually unable to sit or stand still or stay away from telephones.³⁴

Todd meets AO

Cinerama may have been born in a Broadway theater, but it was hardly grounded in narrative.³⁵ Todd-AO transformed Cinerama and Broadway into a new product that culled the most spectacular elements of both. Mike Todd smartly combined theater setting with theater material for his collaboration with AO (American Optical). The format's filmography reads like a stack of Playbills: the musicals *Oklahoma!*, *South Pacific*, *The Sound of Music*, *Porgy and Bess*, and *Can-Can* were all fresh from Broadway, and Todd had once adapted Jules Verne's novel *Around the World in 80 Days* for the stage, with the help of Orson Welles.³⁶ Lavish as the content and contexts may have been, Todd-AO was always first and foremost a medium, a scientific marvel.

Mike Todd did not intentionally launch the renaissance of wide film. He went about organizing his project as any Broadway producer would, by securing top talent

that would grant him leverage with investors. He acted quickly. In October, a just a month after leaving Cinerama, he had wooed Brian O'Brien (whom he nicknamed "the Einstein of the optical racket) for the design of the new system. On leave from the University of Rochester, O'Brien was currently vice president in charge of research at American Optical and the director of the Institute of Optics. According to John Belton, O'Brien and associates had "worked out the basic optical system paper" by December, and Todd shopped this piece of paper around to potential investors.³⁷

His efforts were highly successful. By March 1953 he had formed the Magna Theater Corporation. This group included Joe Schenck, executive head of production at Fox and major stockholder in the United Artists theater circuit; George Skouras, president of United Artists theaters; independent Hollywood producer Edward Small; Lee Schubert, operator of the majority of New York's legitimate [stage] theaters and Arthur Hornblow Jr., producer and trusted friend of Richard Rodgers.³⁸ With these funds, O'Brien reportedly assembled a staff of one hundred researchers from American Optical to design a "one-hole" widescreen system superior to *Cinerama*.³⁹

American Optical turned to wide-gauge film as a solution. Looking into the failed systems of 1929, they discovered that some studios had kept their scarcely-used widescreen cameras and projectors in storage. Todd managed to purchase an old Mitchell 70mm camera from Paramount for use as a prototype. American Optical contracted the Mitchell company to build a similar camera, and hired Phillips of Holland to design a projector that would fit in a regular booth.⁴⁰ Importantly, both the camera and the projector (assembled by Philips of Holland) were backwards-compatible; with a few adjustments, regular 35mm and Cinemascope could be threaded into the Todd-AO system.⁴¹ American Optical crafted the lenses. Unlike 35mm lenses, which are classified by focal length, the four Todd-AO lenses are classified by angle of coverage: 128, 64, 48, and 37 degrees, respectively.⁴² Through the use of these interchangeable lenses,

directors could film close ups and medium shots as well as panoramas, adding a degree of narrative intimacy not possible in Cinerama.⁴³ Because the use of these wide-angle lenses (especially the 128 degree “bug eye”) created edge distortion, AO also devised an optical printer with a built-in distortion corrector.⁴⁴ Todd-AO’s 52x26 foot, deeply-curved screen helped to minimize distortion and light reflection. However, after *Oklahoma!* and *Around the World in 80 Days*, the curved screen was discarded, and the film speed was decreased from 30 to 24 fps, presumably for financial reasons.⁴⁵

Eastman Kodak manufactured special, 65mm film for the system, which had a pulldown of five perfs rather than four. Release prints were 70mm wide, carrying six magnetic soundtracks: two at the perimeter of the frame and another four outside the perforations.⁴⁶ Five of these tracks, feeding five speakers behind the screen (for dialogue), and the sixth track fed various surround speakers (for music and sound effects.)⁴⁷ The sound system was nearly the same as Cinerama’s, but boasted the added feature of backwards-compatibility.⁴⁸

Shooting on doublewide film more than nearly tripled production costs.⁴⁹ To ensure that the first Todd-AO production turned a profit, Todd set his sights on the most coveted theatrical property in the business, Rodgers and Hammerstein’s *Oklahoma!*, which debuted on Broadway in 1943.⁵⁰ Arthur Hornblow had already convinced Richard Rodgers and Oscar Hammerstein to sit on the board of directors at Magna, but the Broadway bigwigs were in no hurry to relinquish the movie rights to their high-grossing musical, especially not to the creators of a system that was still in the development. Undeterred, Todd outfitted his vintage Mitchell with AO lenses and hired director Fred Zinnemann to film some *Oklahoma*-esque test scenes to seduce Rodgers and Hammerstein.⁵¹

Magna’s experiment worked; in the final deal, for a hair over a million dollars and forty percent of the box office gross, Rodgers and Hammerstein relinquished a five-year

option on *Oklahoma!* and several other popular musicals.⁵² Naturally, the Broadway producers demanded total creative control. They considered Cinerama's audience-participation aesthetic (i.e., the famous rollercoaster sequence in *This is Cinerama!*) to be dreadfully asinine, and feared similar shenanigans would subtract from the seriousness of their musical. Todd politely paid lip service to this stipulation, and encouraged director Zinnemann to film dramatically swooping helicopter shots for the opening sequence. Not a subtle man, Todd produced a featurette to preface *Oklahoma!*, entitled *The Thrill of Todd-AO*, which dramatically replicated Cinerama's rollercoaster sequence for purposes of comparison.⁵³ Further proof that spectator involvement was explicitly stressed in *Oklahoma!* is in the newspaper ads: "You're in the show with Todd-AO!"⁵⁴ Mike Todd did make one major concession to the famed duo, however: he decreed that no popcorn would be sold at any screening of the film.⁵⁵

Oklahoma premiered in October 1955 at New York's Rivoli Theater. Critical response illustrates the extent to which discriminating tastes in widescreen spectatorship had permeated the culture; reviewers from the *New York Times* and the *Los Angeles Times* were almost comically exacting, listing such arcane grievances as "unwieldy close ups," "looming gigantism" and "non-insistent third-dimensional effect."⁵⁶ *Oklahoma!* audiences made it clear: the performances, sets, and songs within the film were very nice, but the system's technical merit was a deal-breaker.

Todd-AO cleaned up at the Oscars; its roster of fifteen feature films garnished eighteen Academy Awards, and the system itself won a "special Oscar" for scientific achievement in 1958.⁵⁷ All in all, the system lived up to its slogan, "the hallmark of quality."

Unfortunately, this quality carried too great a price tag to sustain itself. Theoretically, the Todd-AO "supercircuit" distribution model should have worked as follows: exhibitors absorbed the cost of pricey theater renovations in exchange for an

exclusive product—one which would not play outside Todd-AO theaters for an extended run of up to one year.⁵⁸ This setup allowed Magna to skirt the antitrust laws effected in the Paramount Case. However, Todd could not resist capitalizing on the mass market. The producers simultaneously shoot *Oklahoma!* and *80 Days* in 65mm and CinemaScope, and used optical printers to reduce the later films to 35mm for wide release in theaters equipped with CinemaScope.⁵⁹ While at the time this practice seemed a prudent way for Todd-AO to minimize the risk of their own investments, the choice to compromise the so-called exclusivity of the Todd-AO product ultimately defeat the company.

By the time TODD-AO debuted in 1955, many top-tier theaters had already shelled out \$25,000 to convert to Cinemascope. Because these new converts were aware that all Todd-AO productions would eventually be available in Cinemascope, Todd-AO conversions (an additional \$40,000) were a tough sell.⁶⁰ For other theaters, the glut of widescreen formats on the horizon was incentive enough to wait for battle of the scopes to blow over. In the end, Magna paid for many of the conversions.

In 1958, the loss of the company's flamboyant namesake proved truly ominous. The 1960's brought innovation in the production and exhibition sectors that led to the format's near-total demise. Panavision introduced a printing method that could blow up 35mm anamorphic negatives to decent-quality 70mm prints, rendering the practice of shooting wide gauge redundant.⁶¹ Throughout the decade, the practice of bisecting of existing theaters ("twinning") and the construction of multiplexes shrunk individual screens so that multiple movies could be shown at once.⁶²

Technical quality, therefore, moved aside for title quantity. On one hand, this is unfortunate; according to an online group of 70mm enthusiasts, only one theater in the New York City area, the Museum of the Moving Image, is today equipped for wide-gauge projection.⁶³ On the other hand, the diversification of the industry in the 1960's

and 70's cleared a path for independent filmmakers to voice idiosyncratic, controversial opinions about American life. In present culture, few people would insist that high-budget filming techniques have a direct relation to high-quality films. Perhaps it is best that Todd-AO remains transfixed the golden-age of popular imagination; had it survived, the world's supply of musicals would now be utterly desiccated.

¹ Scheuer, Philip K. "New Wide Screen Process Enters Battle of Scopes," *Los Angeles Times*. Jun 27, 1954; D4.

² Belton, John. Widescreen Cinema.

³ I borrow this phrase from John Belton.

⁴ Carr, 64.

⁵ Carr, 1.

⁶ Carr 8.

⁷ Carr, 9. Specifically, Paramount's Magnafilm (56mm, 1929), Warner Brothers' Vitascope (65mm, 1930), Natural Vision (63.5mm, by RKO in 1930) MGM's RealLife (70mm, 1930) UA's 70mm (1930), and Fox' Grandeur (70mm).

⁸ Enticknap, 55.

⁹ Some exhibitors tried to restore the 1.33x1 silent aspect ratio by adding undersize aperture plates to mask the frame, and then over-magnifying the image. This resulted not only in poor resolution, but decapitated, footless actors as well. Enticknap, 52-53; Carr, 9.

¹⁰ Gil, Richard. "An Empirical Investigation of the Paramount Case."

(<http://people.ucsc.edu/~rgil/paramount.pdf>)

¹¹ Erffmeyer, 30. Wikipedia 'double feature' (http://en.wikipedia.org/wiki/Double_feature)

¹² Salt

¹³ Belton, 76-84.

¹⁴ Enticknap. 53.

¹⁵ Wikipedia: history of television. http://en.wikipedia.org/wiki/History_of_television

¹⁶ Belton, 76.

¹⁷ Erffmeyer, 29-30.

¹⁸ Belton, 165.

¹⁹ National Engineers <http://fermat.nap.edu/books/0309051460/html/161.html>

²⁰ Enticknap, 64.

²¹ Erffmeyer, 49.

²² Belton, 162.

²³ As Belton also points out, the Paramount Case was not without loopholes; Fox found ways around the "vertical disintegration" decree. 71.

²⁴ Belton, 162.

²⁵ Carr, 11.

²⁶ Erffmeyer, 44.

²⁷ Belton, 162.

²⁸ Belton, 165.

²⁹ Belton, 165.

³⁰ Carr, 165.

³¹ "Showman Mike Todd Killed in Fiery Air Crash" *Los Angeles Times*. Mar 23, 1958; 1. and Scheuer, Philip K. "Drama: Mike Todd Quits Legit," *NYT*. Nov 10, 1953; 21.

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- ³² (Reuters) "Todd, Reds Discuss Film Exchanges," Washington Post and Times Herald, 1958; A17. Marling, Karal Ann. "As Seen on TV: Visual Culture in the 1950's." See Marling's excellent essay "Nixon in Moscow: The Kitchen Debate."
- ³³ "Showman Mike Todd Killed in Fiery Air Crash. *Los Angeles Times*.
- ³⁴ "Career of Todd was a Gaudy One." New York Times. Mar 23, 1958; 80.
- ³⁵ Belton, 110.
- ³⁶ Belton 176.
- ³⁷ Belton, 165-66.
- ³⁸ Belton, 166. "New Group enters wide screen field." *New York Times* March 25, 1953.
- ³⁹ Belton 173.
- ⁴⁰ Belton, 166.
- ⁴¹ Carr, 166.
- ⁴² Carr, 170.
- ⁴³ Belton 168.
- ⁴⁴ Belton 171.
- ⁴⁵ Enticknap, 64.
- ⁴⁶ Salt, 319.
- ⁴⁷ Carr, 171-72.
- ⁴⁸ Enticknap, 150.
- ⁴⁹ Belton, 160.
- ⁵⁰ Belton, 160.
- ⁵¹ Belton 174..
- ⁵² Belton, 174.
- ⁵³ Carr, 168.
- ⁵⁴ Display Ad 54. Wall Street Journal. October 17, 1955; 13.
- ⁵⁵ Belton, 162.
- ⁵⁶ Crowther, Bosley. "'Oklahoma!' is Okay." *New York Times*. October 11, 1955. and Scheuer, Philip K. "'Oklahoma Magnificent in Debut as Film." *Los Angeles Times*. August 21, 1955; D1.
- ⁵⁷ "Career of Todd was a Gaudy One." *New York Times*. March 23, 1958; 80..
- ⁵⁸ Belton, 174-175.
- ⁵⁹ Carr, 169-70.
- ⁶⁰ Belton, 175.
- ⁶¹ Carr, 178.
- ⁶² Enticknap, 154.
- ⁶³ In70mm.com