



*Kodachrome test strips. C. 1935.*

# The China Girl on the Margins of Film

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In 2005, at the Fogg Art Museum at Harvard University, Julie Buck and Karin Segal exhibited *Girls on Film*, a series of seventy photographs blown up from “China Girl” frames the two artists and archivists had collected while working at the Harvard Film Archive. The show gave visibility to an unusual type of technical image used in film laboratories: typically an image of a woman positioned next to color swatches and patches of white, gray, and black. The China Girl, sometimes called the China Doll, China Lady, girl head, or any number of lab-specific nicknames like Ullie, Marcie, Shirley, and Lilly, was used from the late 1920s until the early '90s, and continues in limited use today. It appears in every country with a major film industry, including the United States, France, Germany, Italy, China, Korea, Japan, and India. In Western nations, the China Girl is almost always female, young, conventionally attractive, and, despite the racial connotations of the name, white. In film laboratories, it is an essential part of quality-control processes, used to calibrate the desired exposure and color balance of film reels as well as the functionality of developing and printing machines. It has analogues in still photography and computer technologies as well.<sup>1</sup>

Buck and Segal hoped that former China Girl models might come forward and identify themselves, as China Girls were never credited for their roles. None did, however. As Buck explained, “We wanted to free these women, but we realize they’re still trapped in their images.”<sup>2</sup> Outside of highly specialized sectors of the film industry, namely, those workers who handle and scrutinize celluloid prints, the China Girl is not well known, and most China Girl models have typically remained anonymous.<sup>3</sup>

1. For the “Shirley” image used in still photography, see Lorna Roth, “Looking at Shirley, the Ultimate Norm: Colour Balance, Image Technologies, and Cognitive Equity,” in *Canadian Journal of Communication* 34, no. 1 (2009), pp. 111–36, and Lorna Roth, “The Fade-Out of Shirley, a Once-Ultimate Norm,” in *The Melanin Millennium*, ed. Ronald E. Hall (Dordrecht: Springer, 2013), pp. 273–86. In computer technologies, the Lenna or Lena image, based on a November 1972 *Playboy* cover image of model Lena Sjöblom, has been used as a reference in image processing since 1973. See Jamie Hutchinson, “Culture, Communication, and an Information Age Madonna,” in *IEEE Professional Communication Society Newsletter* 45, no. 3 (May/June 2001), pp. 1, 5–7.

2. Julie Buck and Karin Segal, interviewed by Gerald Peary, “Girls on Film,” <http://gerald-peary.com/essays/ghi/girlsonfilm.html> (accessed February 10, 2012).

3. There are rare examples of well-known actresses, including Romy Schneider and Elizabeth

In the film laboratory the China Girl has been ubiquitous. Every film commercially produced on celluloid, and nearly every strip of film, contains the image of a woman posed next to swatches of color. As John Pytlak, a former Kodak engineer, said when he accepted an Academy Award for his work on the Laboratory Aim Density or LAD system, “She has probably been in more movies than any other actress in the world.” The China Girl has numerous quality-control applications in the film laboratory. Typically, when an exposed reel of film is printed, a corresponding strip of China Girls, usually four to six frames, will accompany the film through its development process. These China Girls will be compared to “master” China Girls that have already been developed to check accuracy. China Girls are then used in the process of color timing, where the China Girl acts as a kind of shorthand for the rest of the film, indicating whether the color processes occur as expected or deviate in any way. In the final printing of the film reels, China Girls are used again to make sure printing is consistent across the various reels of a feature-length film, each time tested against a master or control China Girl. In recent decades, despite the introduction of technological tools that have refined the process, the quality-control practices associated with the China Girl have remained largely unchanged.

Film viewers do not typically see the China Girl. In any given reel of a commercially produced 16mm or 35mm film, three to six China Girl frames are usually cut into the countdown leader, normally between the numbers 10 and 3. Yet this part of the filmstrip is not meant to be projected. The only way a China Girl may be glimpsed in a theater would be if a projectionist failed to switch reels at the correct time, allowing the ends of the film to run out. Even then, the short duration of the China Girl’s appearance would be just as easy to miss, lost in the blink of an eye.<sup>4</sup>

The China Girl has been overlooked by film historiography as well.<sup>5</sup> Though many within the industry, particularly those who physically handle celluloid or

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Taylor, posing as China Girls. These, however, are the exception. In a few cases I have been able to identify women who posed as China Girls. Emme Marcy Rylan, the woman who posed as the current Kodak LAD and Digital LAD, has acted in numerous soap operas. See <https://sites.google.com/site/donutsience/Home/kodakmarciefinallyidentified> (accessed December 1, 2013). In addition to interviewing Lili Young, the China Girl filmed in the late 1960s at DuArt in New York, I have also spoken to Ullie (who refused to give her last name), the technician who also posed as a model at Cineric in New York, and identified the son of the woman who posed as the BKSTS Reference Leader Picture.

4. Becca Hall, projectionist at the Gene Siskel Film Center in Chicago and director of the Northwest Chicago Film Society, described such accidental occurrences as “the face of the ashamed projectionist.” Phone interview with author, February 2, 2012.

5. There are few discussions of China Girls in film scholarship, though work has begun to emerge in recent years. See Mary Ann Doane, “Screening the Avant-Garde Face,” in *The Question of Gender: Joan W. Scott’s Critical Feminism*, ed. Judith Butler and Elizabeth Weed (Indianapolis: Indiana University Press, 2011), pp. 206–229, citation on pp. 222–24, for a discussion of Julie Buck and Karin Segal’s exhibition, as well as Michelle Silva’s *China Girls* (2006). For a discussion of Gabi Horndasch’s *Versteckte Catherine* (1999/2000), see Rembert Hüser, “Finding Openings with Opening Credits,” in *Media, Culture, and Mediality: New Insights into the Current State of Research*, ed. Ludwig Jäger, Erika Linz, and Irmela Schneider (Bielefeld: Transcript Verlag, 2010).

acetate film, express familiarity or even longtime fascination regarding the China Girl, there is not, to my knowledge, a confirmed written account that describes the first usage of a China Girl nor the origins of the name.<sup>6</sup> Varying accounts have explained the term as relating to china dolls, or porcelain, a material that was sometimes used, in the case of posed dolls, and more broadly was suggestive of a delicate and refined quality that models aspired to in their appearance or dress. A more likely origin is the orientalist connotation of the term, expressed in the makeup, mandarin-collared clothing, and tightly drawn hairstyles of the women, which privilege a woman's subordinate, submissive behavior, qualities that would be consistent with the technological function the image serves. The name "China Girl" and its variants circulate as part of laboratory vernacular and are only infrequently mentioned in the technical literature. As a result, it forms a kind of shadow history to the well-documented accounts of film stocks and the development of standardization methods for the film industry.

In this essay, I address the theoretical implications of the China Girl as a consistent technical feature of film production and, significantly, as a subject imbued with what we might call a "reception history." Both aspects are expressed in and through a strand of experimental films and digital works that call into question the constitution of each medium in which she appears.<sup>7</sup> First, the China Girl links a notion of filmic materiality with femininity, particularly one that is racialized or orientalized. Second, the China Girl's enduring presence in increasingly digital contexts, despite its technological obsolescence, problematizes the supposed immateriality of these new technologies and offers an opportunity to reflect on the conditions of post-filmic materiality. Finally, the China Girl offers a way to think about the survival of filmic materiality through digital means—an issue made all the more urgent given the recent bankruptcy filings and lists of discontinued film stocks at Kodak, Fuji, Technicolor, as well as the closing of most commercial film laboratories around the world.

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Although the China Girl denotes an image that does not appear to move, it is not photographic but cinematic: an image created by shooting a roll of 16mm or 35mm film, with the model sitting still in her pose. For much of the twentieth century, individual film laboratories produced their own China Girls, sometimes hiring models especially for that purpose or persuading their female employees to

6. The first mention of a "close-up of a girl" doesn't occur in *Journal of the SMPE* until 1933, though the densitometer first appeared in the journal in 1923. The term "gray lily card" first appears in a 1958 article. "China Girl" and "girl head," though they had long been used in film-laboratory vernacular, only appear in the journal decades later.

7. In this essay, I toggle between the pronouns "it" and "she" in describing the China Girl. Generally "it" will designate the China Girl as an image, a technical object, used in laboratories. "She" will be about the figure, the woman, the subject, who appears within that image. These are somewhat slippery designations, of course, but the intent is to clarify the duality of the China Girl as both an image and a subject.

pose. Quality-control technicians would expose a roll of film and duplicate it in batches many times over.<sup>8</sup> The images would then be stored in a freezer to preserve their chemical composition, with individual frames periodically snipped to be used as test images in the various applications described above. In this way, the image of a given China Girl could linger in a laboratory for years, even decades. China Girls were given nicknames and absorbed into the workplace culture. Their images appeared everywhere, not only on every filmstrip but hanging from walls, glowing from light boxes, or sometimes blown up and admired on their own.

There are several industrial conditions that support the contention that the practice was introduced in the early 1920s and became widespread by the end of the decade. In the context of the first decade of the film industry, a period of rapid expansion and standardization of production practices, the research that led to the development of the China Girl came out of the Kodak Research Laboratories, which was closely affiliated with the industry's chief technical professional organization, the Society for Motion Picture Engineers (SMPE, later SMPTE, to include television). Kodak researchers set the standards and authored the procedures for quality control in processing and printing film. This included the use of instruments like the densitometer, which was used to measure the amount of light blocked by the silver grains in a filmstrip, or the density of an image. These researchers also established test cards and images by which such instruments were operated. As the industry grew, two major technological advances demanded more precise quality-control measures: sound in the early 1930s, and color in the early 1950s. Sound required a host of infrastructural changes, and in the laboratory, researchers began using the densitometer and other sensitometry instruments to more closely monitor the variations that could arise in printing and processing. Though densitometers and scene testers were invented in the early 1920s, it was only with the adoption of sensitometry for sound in the latter part of the decade and early '30s that these instruments, and the test materials associated with them—chiefly China Girls—became widely used.<sup>9</sup>

8. A roll would be four hundred feet of 16mm film or one thousand feet of 35mm film.

9. J. I. Crabtree, the co-author of *Motion Picture Laboratory Practice* (1936), the industry standard for laboratory procedures, writes: "After sensitometry had proved its worth in the control of variable-density sound tracks, the next step was to apply it to the control processing of picture negatives and prints.... Provided with a sensitometer and densitometer and other refined instrumental aids, the laboratory was able to measure not only variations in the activity of the developer and variations in the degree of uniformity of processing resulting from changes in temperature and degree of agitation, but likewise variations in uniformity of the photographic characteristics of the film emulsions. This had the beneficial effect of compelling the film manufacturers to improve the uniformity of their product, the lack of which it was previously possible to blame on the laboratory. See C. E. Ives and J. I. Crabtree, "A Trial and Error Method of Preparing a Motion Picture Sensitometer Tablet," *Transactions of the Society of Motion Picture Engineers* 11, no. 32 (1927), pp. 740–9, and J. I. Crabtree, C. E. Ives, and Fordyce Tuttle, "A Semi-Automatic Timing Device for Motion Picture Negatives," *Journal of the SMPTE* 15, no. 5 (1930), pp. 587–97. In another publication, Crabtree affirmed this same fact: "The application of sensitometric methods of control to the processing of motion picture film began shortly after the introduction of the sound picture in 1928, but it was not until 1930 that such methods were in general use." Crabtree and Matthews, *Motion Picture Laboratory Practice*, p. 186.



*BKSTS Reference Leader Picture. 1970.*

With the broad adoption of color in the early 1950s, there arose the demand for still more stringent quality-control measures. While color technology existed prior to the 1950s, the use of color in mainstream film had been monopolized by Technicolor since the late 1910s.<sup>10</sup> In 1949 Kodak introduced Eastmancolor negative color stock, its first three-color, single-strip color negative and printing film stock.<sup>11</sup> This was significant because it meant that any lab, and not just those operated by Technicolor, could develop and print color film. A host of other color stocks made by a number of rival manufacturers soon followed. Laboratories in the '50s once again faced pressure to maintain consistent control over variations, now in color as well as image density and sound. To address these increased demands in quality control, individual labs began producing their own China Girls. By the '60s, film manufacturers were also selling China Girls to accompany each film stock.

10. Technicolor dominated the color market from the late 1910s through the early '50s, in large part owing to the vast resources the company poured into its color processes and the protectiveness with which it guarded its photochemical secrets. Although Technicolor opened up its operations to licensing services and its equipment to other producers in the '30s, it maintained a significant degree of control and secrecy over the cinematography, developing, and printing of its film stocks, which remained in place throughout the first half of the twentieth century.

11. Previously, Kodak had done significant research into color film stocks including Leopold Mannes's and Leopold Godowsky's development of the second Kodachrome in the early 1930s. Douglas Collins, *The Story of Kodak* (New York: Abrams, 1990), p. 206. The image of the woman in a headscarf in the Kodachrome test strips above also appears as the China Girl for Eastman Color Negative Film Type 5251, which can be seen in Morgan Fisher's *Standard Gauge* (1984). 5251 was used from 1962 to 1968.

Another major industrial development requiring the use of a China Girl relating to color was the conversion of film for television broadcast in the 1960s and '70s. Accurate color reproduction was especially crucial in the representation of flesh tones, and SMPTE publications grappled with the challenges such representation posed. Predictably, these articles abstracted the body into a range of skin colors, couching implicit issues of race and racial differentiation within technical jargon and ostensibly scientific, objective rhetoric.

"Flesh tone" and "skin tone" do not appear in SMPTE publications until 1955 and 1956, respectively, and both occur in discussions of particular problems arising from tonal and color variables of broadcast television.<sup>12</sup> In color television, Salvatore J. Bonsignore confirmed the primacy of the representation of flesh tones. "Skin tone is regarded as the most important standard in the color picture," he writes. "As long as skin tones appear natural to the public, the color picture will be successful."<sup>13</sup> Color effects in lighting, makeup, and staging were permissible so long as they did not interfere with the perceived natural color of a (white) actor's face.

The discrepancy between supposedly objective registration and its subjective apprehension persists in attempts during the 1970s to standardize values for skin tone with China Girl reference cards. In 1970, the British film manufacturer BKSTS produced its own China Girl, the BKSTS Reference Leader Picture, to "assist the object and subjective colour balance control of 16mm and 35mm prints in both the film laboratory and the television studio."<sup>14</sup> Ray E. Knight explains the choice of the female figure as the BKSTS reference image:

An aesthetically pleasing picture was required that would provide both objective and subjective information relating to tone response and colour rendering at the laboratory



*China Girl.*  
C. early 1930s.

12. "Flesh tone" is used in Donald G. Fink, "Color Television vs. Color Motion Pictures," *Journal of the SMPTE* 64, no. 6 (June 1955), pp. 281–90, and "skin tone" appears in Harold Wright, "Television Studio Practices Relative to Kinescope Recording," *Journal of the SMPTE* 65, no. 1 (1956), pp. 1–6.

13. Salvatore J. Bonsignore, "The Art of Color TV," *Journal of the SMPTE* 65, no. 8 (1956), pp. 435–6, citation on p. 435.

14. Ray E. Knight, "The BKSTS Reference Leader Picture," *British Kinematography Sound and Television* (September 1970), pp. 248–52, citation on p. 248. The BKSTS image was manufactured by Studios and Engineering at Thames Television Limited, in collaboration with Technicolor and Rank Film Processing Limited. Additionally, Knight notes that Kodak survey control strips were used to "establish standard conditions" (p. 252).

grading phase of producing a print and later in setting-up telecine. The picture therefore contains a face, in close-up, and a selection of neutral grays. . . . A girl's face was chosen, rather than a man's, for no better reason than it seems traditional to do so. However, since the BBC Research Department finds that the face of a man makes a more critical test of colour fidelity than that of a girl, future test scenes may be based on men: after all, more men are seen on television than women.<sup>15</sup>

In this passage, there is some dissent as to the utility of a face for setting the color standard of an entire film or television program. Subjective apprehension is seen to depart from objective assessment, a misalignment that pervades the entire history of the China Girl. While the scrutiny of a China Girl by a technician's eye was the chief means of determining image consistency in the early twentieth century, its utility was diminished as technological developments took over its original functions. From a technological standpoint, the China Girl, by the late 1970s especially, was all but unnecessary to the procedures to which it had previously been essential. It became a visual reference, a check, and an unusually durable vestige of traditions past.

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The BKSTS article touches on another ambiguity concerning subjective and objective apprehension: the presumption that a single, and implicitly white, skin tone could stand in for all others. The flesh-tone issue here speaks to the racial bias in film and television equipment, manifest as the degree to which white skin is perceived as natural, ideal, and uniquely correlative to instruments valued for their precision and accuracy.

This racial bias, however, is only implicit. In practice, laboratories avoided not only race but even bodies. In their place, we find "flesh tone" chips or dummy heads fitted with wigs made from human hair.<sup>16</sup> In a 1978 discussion of the BBC's Test Card 61, for example, E. W. Taylor and S. J. Lent note that in the printing of film, "the portrayal of a live model enables the subjective flesh tone balance to be readily made." This subjective apprehension is aided in large part by the "naturalness" of the China Girl.<sup>17</sup> Rather than accede to the perceived need for a human model, as other laboratory technicians maintained, Taylor and Lent attempt to reproduce the conditions of "naturalness" by making a test card representative of flesh tone.

15. Ibid., pp. 249–50.

16. The most extreme example of the color abstracting of the body can be found in the "skin" signal used for television in the late '70s, produced by the WGBH Educational Foundation and the 3M Corporation. The signal's screen of pale orange was intended to match white skin tone, and, in a semantically loaded turn, it replaced the televisual process of scanning with its own terminology of "skinning." As Richard Dyer notes, "The whole process centered on blank images representing nothing, and yet founded in the most explicit way on a particular human flesh colour." Richard Dyer, *White* (London: Routledge, 1997), p. 94.

17. E. W. Taylor and S. J. Lent, "BBC Test Card No. 61 (Flesh Tone Reference): Colorimetric and Other Optical Considerations," *Journal of the SMPTE* 87, no. 2 (1978), pp. 76–78, citation on p. 76.



The BKSTS article, along with Taylor and Lent's experiments, indicates that the China Girl was valued for the woman's flesh alone, which they agree provides an index of ideal skin tone. Given the fact that nearly all China Girls in Western countries are racially white, the woman's idealized appearance means an index based on her white skin. The notion of "ideal," of course, is conflated with whiteness, a (color) value presumed to be natural, ubiquitous, neutral, and, to a great extent, invisible or inconspicuous, like the China Girl herself.<sup>18</sup> The aim for an ideal, which is also measured as a norm, produces a fiction of a single color against which all others can and must be measured. Taylor and Lent's use of the word "natural" to designate a single, white subject signals the artificial and arbitrary premise of racial categorization.<sup>19</sup>

The presumed neutrality of white skin tones often presents a problem for technical analysis. When, for example, David L. MacAdam pursued printing tests of "a young lady" in the 1950s, he concluded that "[o]ptimum reproduction of skin color is not 'exact' reproduction. . . . '[E]xact reproduction' is rejected almost unanimously as 'beefy.'" On the other hand, when the print of highest acceptance is masked and compared with the original subject, it seems quite pale."<sup>20</sup> Lighting and exposing a film based on a white face often means that the values for everything else—sets, props, costumes, and other actors—are thrown off. A correct exposure for a pale white face, then, might mean that a darker complexion will be underexposed. In films where two actors with strongly contrasting skin tones appear in the same frames together, Hollywood cinematographers have tended to favor exposures that compliment the white actor.<sup>21</sup> In these examples, the objec-

18. Jean-Louis Comolli and Paul Narboni, Brian Winston, Lorna Roth, and Richard Dyer have all investigated the racial qua ideological biases within image-technology apparatuses that otherwise present themselves to be based on neutral scientific principles. See Comolli and Narboni, "Cinema/Ideology/Criticism," trans. Susan Bennett, *Screen* 12, no. 1 (Spring 1971), pp. 145–55; Comolli, "Technique and Ideology: Camera, Perspective, Depth of Field," trans. Diana Matias, in *Narrative, Apparatus, Ideology: A Film Theory Reader*, ed. Philip Rosen (New York: Columbia University Press, 1986), pp. 421–43; Winston, "A Whole Technology of Dyeing: A Note on Ideology and the Apparatus of the Chromatic Moving Image," *Daedalus* 114, no. 4 (Fall 1985), pp. 105–23; Winston, *Technologies of Seeing: Photography, Cinematography and Television* (London: British Film Institute, 1996); and Roth, "Looking at Shirley, the Ultimate Norm." Dyer notes that, against the presumed neutrality and scientificity of imaging technology, racial biases nevertheless have governed the development of film stocks, chemicals, and other machines that produce the very conditions by which representation can occur. "Stocks, cameras and lighting were developed taking the white face as the touchstone. The resultant apparatus came to be seen as fixed and inevitable, existing independently of the fact that it was humanly constructed. It may be—certainly was—true that photo and film apparatuses have seemed to work better with light-skinned peoples, but that is because they were made that way, not because they could be no other way" (Dyer, *White*, p. 90).

19. In his study of whiteness and photographic media, Dyer observes an inherent "racial character of technologies" that reveals itself in the use of white skin tone as a measure for others. It is important to note that this "racial character" is not tantamount to racism (e.g., the notion that technologies themselves are or can be racist), but rather is designed according to perceived markers of racial differentiation. Thus, as a racial trait, whiteness may be *ideologically* neutral or invisible, but in color analysis it nevertheless registers a range of chromatic values. Dyer, *White*, p. 83.

20. David L. MacAdam, cited in Brian Winston, "A Whole Technology of Dyeing," pp. 105–23, citation on p. 120.

21. Dyer discusses this embedded photochemical anti-miscegenation in Hollywood films that have

tive neutrality of the white face is not only revealed to be a highly subjective and unreliable visual referent, but it can also undo the work of verisimilitude it is meant to uphold.

Although the China Girl is demonstrably racialized, the “China” modifier is innocent in this regard, or at least misleading where whiteness (and not “Chineseness”) is apparently in question. “China,” then, signals colorful embellishment or the model’s femininity on its own.<sup>22</sup> The otherness signaled by the orientalist designation of the China Girl is deflected by adornment and other strategies that aim to minimize and marginalize the oriental, the feminine, and the decorative. Rosalind Galt has argued that these three qualities form the denigrated category of the pretty, which, in its opposition to masculine, heroic, and Western aesthetics, can productively form a politics of the excluded, namely, that of race, gender, and sexuality.<sup>23</sup> Starting from appropriations of the China Girl in experimental film, the pretty can act as a disruptive shadow aesthetic, troubling the homogeneity of dominant forms of representation. In the context of Galt’s theorization of the pretty, then, Knight’s remark about a man’s superior “colour fidelity” might accord with a desire for rationality and objectivity rather than with physiological traits. And it is this desire that indicates the degree to which arbitrary preferences for *certain* skin tones and a *particular* gender are made to conform to supposedly objective and neutral technological procedures.

In 1976, John Pytlak introduced the LAD system, which gives a more precise reading of density based on an 18 percent gray patch that forms part of the



*Kodak Laboratory Aim Density (LAD) system image. 1976.*

had at least one black and one white lead, including the *Lethal Weapon* series, *In the Heat of the Night*, *Rising Sun*, and *A Few Good Men*. Dyer, *White*, pp. 98–103.

22. The names for China Girls in other languages support this orientalism. Beyond “Lili,” they are known in France as “la chinoise,” “Kodakette,” and “la bridée,” with this last referring to the slanted shape of Asian eyes. In Thailand, “Muay” or “Ar Muay” is used, also referring to the look of a Chinese girl. “China Girl” is also employed in Japan. In other countries, China Girl names emphasize their doll-like characteristics: Mexico uses “muñeca” or “mona” to refer to dolls, and Argentina similarly uses “muñeca de porcelana.” Laboratories in Austria refer to them as “Conchita.”

23. Rosalind Galt, *Pretty: Film and the Decorative Image* (New York: Columbia University Press, 2011), p. 20.

China Girl image.<sup>24</sup> This became and remains the industry standard. If the technological justification for the China Girl had been on the wane before, this was its death knell: The LAD patch effectively rendered the China Girl, the face of a woman, functionally useless. Perhaps unsurprisingly, however, the China Girl survived this technological development and became a companion to the LAD patch, even sharing a name with it: the LAD Girl or, more affectionately, the LAD Lassie.

Digital technologies, of course, have developed their own variations of LAD controls. Like the telecine procedures in film-to-television conversions, which are workflows that involve analogue film at some level, processes of digital conversion like digital film recorders depend on digital LADs, or DLADs. There are also numerous faces used in reference charts for printer settings as well as monitor-calibration reference sheets. Despite the increasingly sophisticated technological means, the image of the China Girl persists even when—especially *after* the innovation of the LAD patch—it is in many ways unnecessary to the process for which it was originally intended. Many of the technicians I've spoken to in both traditional film and digital facilities have admitted that there is no longer any real need for the China Girl—as a white, female face or as any human face at all. As David Corley, a former film laboratory technician and founder of DSC Labs, a company that produces digital test patterns for television broadcast, remarked: “Personally, I found [China Girls] totally useless. Because there is an enormous range of skin tones, how do you say one skin tone is right and another is wrong? The only thing a China Girl would be useful for would be a subjective evaluation of the image.”<sup>25</sup>

Given the apparent nonfunctionality of the China Girl, the image's enduring presence can seem puzzling. Some technicians insist that it offers a visual check, however subjective, of densitometer readings, and that it provides a recognizable form to confirm sensitometric measurements. As a face, however, the China Girl suggests something more, an attachment that approaches a kind of pathos or sentimentality, which is evident in the many private collections of clipped China Girl frames. As film facilities shrink or shut down, the China Girl has become one of the more poignant symbols of an outmoded industrial model in an era of profound technological change. Its ephemerality, the anonymity of the women who posed as models, the abstractions and rare mentions of the image in industrial manuals, and the literally marginal position the figure occupies in relation to the history of cinema may be, somewhat ironically, the traits that best express a sense of nostalgia for a vanishing medium.

24. Steve Blakely, laboratory technician at DuArt, explains: “The 21-step strips that were exposed in the lab (on a sensitometer) were more variable from lab to lab, and the exposures varied depending upon the exposure the lab did, the stock itself, and the way it was developed. The strip plotted out was a means of determining the gamma/contrast of the processes.” Interview with author, January 4, 2011.

25. David Corley, phone interview with author, January 26, 2011.

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Thus far I have described the China Girl only generally in gendered, racially complex, and fundamentally descriptive terms, as if she were merely an object, an image, a homogenous construction. While in a grammatical sense that homogeneity holds true, we should also bear in mind the distinct, if anonymous, identities of the many women who posed as China Girls. There have been hundreds, if not thousands, of China Girl models. Nearly all of them are shot in close-up, a framing that, since the time of D. W. Griffith, allows for psychological expression of the individual. Béla Balázs was one of the earliest and most persuasive theorists of the close-up, suggesting that the proximity of the camera to the face revealed “‘micro-physiognomic’ details even of this detail of the body.”<sup>26</sup> In addition to minute expressions, the close-up also opened up the possibility of *unconscious* ones.<sup>27</sup> This unconscious expression, in many ways suggestive of Benjamin’s “optical unconscious,” is that of “the invisible face behind the visible,” a reading *into* the face of the performer that discerns a countenance potentially quite different from what a viewer might immediately perceive. Balázs notes: “On a face, too, one can read ‘between the lines.’”<sup>28</sup>

The China Girl, of course, is positioned differently in relation to the faces onscreen: She is not the invisible other buried *within* the visible image but something that remains *outside* the field of vision afforded by the screen. Though China Girls are on rare occasions produced for individual films, their production and usage exist independently of the films to which they are spliced. A China Girl can thus accompany any number of films, and in some cases, especially with restored or duplicated films, several different China Girls can accumulate on the same strip of leader, artifacts from different laboratory processes. From the perspective of viewers who are mostly unaware of her existence, the China Girl structures an absence, and an imperceptible one at that. She is an extreme manifestation of what the suture seeks to exclude, though she is no less critical in determining cinema’s system of representation as, following Laura Mulvey, a gendered construct.<sup>29</sup> If, for Balázs, a close-up reveals an invisible face within that of an actor, the China Girl that appears behind the scenes figures a different kind of invisible face, one that speaks to a film’s most fundamental conditions of visibility.

26. Béla Balázs, *Theory of the Film: Character and Growth of a New Art*, trans. Edith Bone (New York: Dover, 1970), p. 74.

27. Balázs writes, “[there] are certain regions of the face which are scarcely or not at all under voluntary control and the expression of which is neither deliberate nor conscious and may often betray emotions that contradict the general expression appearing on the rest of the face.” Ibid.

28. Ibid., p. 75.

29. “The various absences upon which classic cinema turns, from the excluded real to the hidden camera and tape recorder, are in effect signified *through* woman.” Kaja Silverman, “Suture,” in Rosen, *Narrative, Apparatus, Ideology*, pp. 219–35, citation on p. 229.

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The China Girl poses a problem of critical looking: How do we, or how should we, look at this image, or at the woman in the image? Though China Girls are rarely viewed in the theater, they are the most carefully scrutinized image in film laboratories. The way a China Girl is regarded in a laboratory, however, is highly particular: Technicians rely on the woman's familiarity, memorizing the ideal amount of detail and contrast in her hair, the color of her eyes and lips, and comparing them against the test China Girls that travel with other images. In the lab, a China Girl presents an image of an ideal appearance, but one that is also ordinary. It is most effective when it ceases to be a distinctive image and registers instead as a common, ubiquitous one, noticeable only when something appears out of place.

When we happen to see a China Girl image in the theater, it offers another view of cinema. Its visibility is a kind of glitch, a momentary breakdown in the cinematic machine. It brings to light, to visibility, all the previously unseen processes, both cultural and technical, that attend its image. The China Girl is prohibited because it reveals the inner workings of the processes that bring films into being, disrupting a movie's narrative reverie by exposing the constitutive seams of the film's construction. When we see it, we realize there is a different system of signification at work behind the images we typically see: For every *leading* lady, there is an attendant *leader* lady.<sup>30</sup>

Experimental film presents a third possibility of looking at the China Girl: the way it, or indeed *she*, has been reclaimed as a subject by certain filmmakers expressly interested in revealing different aspects of the cinematic apparatus.<sup>31</sup> The China Girl

30. I borrow the term "leader lady" from Becca Hall.

31. In addition to the works discussed in this essay, China Girls appear in the following experimental films: *Cosmic Ray* (Bruce Conner, 1961), *White Heart* (Dan Barnett, 1975), *New Improved Institutional Quality* (Owen Land [George Landow], 1976), *Black Cat White Cat It's a Good Cat If It Catches the Mouse* (David Rimmer, 1989), *The Vyrotonin Decision* (Matt McCormick, 2000), *Nadja* (Brian Frye, 2000), *Versteckte Catherine* (Gabi Horndasch, 1999/2000), *MM* (Timoleon Wilkins, 2003), *To the Happy Few* (Thomas Draschen and Stella Friedrichs, 2003), *China Girls* (Michelle Silva, 2006), *Hot Under the Collar* (Jason Britski, 2007), *Movie Tote* (Ephraim Asili, 2007), *Girls on Film* (Julie Buck and Karin Segal, 2008), *Broken Tongue* (Monica Savirón, 2013), and *Second Sighted* (Deborah Stratman, 2014). China Girls also feature prominently in the end credits of *Death Proof* (Quentin Tarantino, 2007). For a list of films that feature leader footage, see Matt Soar and Jackie Gallant, "Lost Leaders: Found Footage and the Metadata of Film (2011–)," <http://www.lostleaders.ca/references/>.

In the domain of visual art, China Girls, Shirleys, and test images have become increasingly prominent. To cite a few examples, Christopher Williams's *Kodak Three Point Reflection Guide © 1968 Eastman Kodak Company, 1968 (Meiko Laughing)*, *Vancouver, B.C., April 6, 2005* (2005) staged photographs of Kodak test images, and two versions of this series were used on a cover of *Artforum* in 2006. (Incidentally, Williams was a teaching assistant for Morgan Fisher during his time as a graduate student at CalArts.) Amanda Ross-Ho's *The Character and Shape of Illuminated Things* (July 23, 2013–May 4, 2014), commissioned for the Plaza Project for the MCA Chicago, features a large sculpture of a model's head in front of a board of color swatches. Adam Broomberg and Olivier Chanarin's 2012 exhibition at Paradise Row in London, *To Photograph the Details of a Dark Horse in Low Light*, features, among various test strips, an array of Shirley reference images. In a later installation of the exhibition at Gallery TWP in Toronto from April 29 to June 2, 2013, several Shirleys were blown up, mounted, and publicly displayed on billboards. Works that employ test patterns include Lucy Raven's *RP31* (2012), which depicts a montage of projection test images in a looped single-channel installation view; Ryoji Ikeda's *Test Pattern* installation and performance works

has played a prominent role in a number of structural films, a branch of the avant-garde explicitly concerned with the material properties of film, including light, projection, and the filmstrip itself. As James Benning, who included a China Girl image in *Grand Opera* (1978), a film that surveys Benning's career as a structural filmmaker, observed, "All films were always structured by a China Girl."<sup>32</sup>

Perhaps the best-known example of a China Girl occurs in a film by Owen Land (formerly George Landow), *Film in Which There Appear Edge Lettering, Sprocket Holes, Dirt Particles, Etc.* (1965). In the film, Land optically printed a strip of China Girl test leader and doubled it horizontally across the frame so that four China Girls are visible, along with the titular edge lettering and sprocket holes. The clip's brevity and its repetition through optical printing produce in the China Girl a convulsive blinking. P. Adams Sitney described the film as "a found object extended to a simple structure, . . . the essence of minimal cinema,"<sup>33</sup> with the industrial footage Land employed serving as a synecdoche for the entirety of filmmaking as an industrial as well as artistic practice. Correspondingly, the film's title is provocatively generic, describing, in a sense, the conditions for every film, or at least every film's leader. Here the word "appear" suggests a "performance" of incidental material, including the accumulation of scratches and dirt particles as well as the marks of edge numbers and sprocket-hole punches that exist prior to the film's exposure. What's missing from this description, of course, is the lead performer, the China Girl herself.

Sitney's commentary on the film, as well as that of Land, focuses on the Duchampian readymade quality of the China Girl image that remains onscreen for the duration of the film, ignoring the specificity of the figure that we see. Land, too, didn't seem to realize that he'd used the China Girl image in a number of films, referring to them decades later as "bimbos."<sup>34</sup> Here, the four multiplied China Girls, though positioned centrally in the frame, still appear in much the same way as they do in regular film-viewing contexts: underacknowledged, if not entirely ignored.

The China Girl, then, is still obscured by the cinematic processes that, in essence, upstage her. Her repetitive blinking in Land's film could be seen as analogous to the blades of the shutter, and she becomes a figure for the apparatus itself (and as with the worst tendencies of apparatus theory, we lose the specificity

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(2008–present); Alexandra Navratil's *Unstable Grounds (After the Great White Silence)* (2011), a film that depicts color test strips for 35mm film; Conny Kuilboer's felted SMPTE signal patterns in *Television* (2005); Hito Steyerl's *How Not to Be Seen: A Fucking Didactic Educational.MOV File* (2013), which offers instructions on manipulating video footage; and David Maljkovic's *New Reproduction* (2013–15), a series of inkjet photo collages featuring Kodak color control patches

32. James Benning, phone interview with author, October 21, 2010.

33. P. Adams Sitney, *Visionary Film: The American Avant-Garde, 1943–2000*, 3rd edition (New York: Oxford University Press, 2002), p. 364.

34. "I discovered that five of my films contain bimbos; it seems to be a recurrent theme. *The Film in Which* has the so-called China Girl; *Bardo Follies*, the southern belle waving to the boat; *Institutional Quality*, the girl who demonstrates the projector; *Thank You Jesus for the Eternal Present* has the 'booth bimbo'; *New Improved Institutional Quality* has the 3D version of the 'China Girl.' So that's some useless information." Owen Land, unpublished portion of an interview by Mark Webber, July 3, 2004.

of the woman that appears). Though the China Girl appears in a manner that is fully present, her convulsive visibility merely reproduces, from within the domain of structural filmmaking, the industrial structures that kept her from view in the first place.

Morgan Fisher's *Standard Gauge* (1984), by contrast, gives specific attention to the China Girl, naming it among a collection of other artifacts gathered during Fisher's time working at a stock-footage company and as an editor on various low-budget films in the 1970s. In this single-take film, Fisher pulls out scraps of found 35mm film and describes the ways he came into possession of the material. Fisher's film is structural in the sense that it concerns the material properties and histories of 35mm and 16mm film, though it departs from the "purist cinema" (to use David James's term)

of Land in its explicit engagement with commercial filmmaking. It was also made some time after the structural-film heyday of the 1960s and '70s, lending Fisher's reflections an attendant sense of nostalgia. Through *Standard Gauge*, Fisher positions himself on the margins of Hollywood, revealing the behind-the-scenes workings of archives, editors, and laboratories in Los Angeles.

Among all of Fisher's gathered materials, there is a pervading sense of fragility and loss, and the China Girl stands out among the material he assembles. He suggests, "This figure's sex, her being in the margin of the film, her serving to establish and maintain a standard of correct appearance; these are aspects of a single question that deserves thought." Yet Fisher provides no answer to this question. Nor, for that matter, is it clear what question the China Girl poses; for Fisher, in a sense, the China Girl herself is a question of the more or less mysterious processes that bring film into being. Furthermore, by making the China Girl the emblem of film, Fisher, like Land, yokes these unanswered questions to a medium that, in 1984, was already rapidly vanishing. The question the China Girl poses, the hope of learning anything more about her, already seems too late.

In Fisher's film, the visibility of the female model is no longer in question, yet she remains anonymous and confined to the vernacular of the test image as such. What this shows is that visibility is not the only issue at stake, or rather, that there are many forms of visuality at work. The view of the China Girl as an image, a material object, and a synecdoche for the entire representational system of the



Morgan Fisher.  
*Standard Gauge*. 1984.

cinema is not the same as the view of her as a woman, an unabstracted or unfetishized subject (if such a thing is possible). Land's and Fisher's films engage the two modes of viewing typically associated with the China Girl—the intense scrutiny of the lab technician, on the one hand, and the chance, fleeting glimpse a viewer might catch, on the other—by allowing the audience to study the image in the manner of the technician. In doing so, they also reproduce the obscurity of the figure within, similar to the way that technicians do not see an individual within a China Girl frame but use her face and flesh tones to measure other types of film images.

Land's and Fisher's works create the possibility, or at least raise the question, of an alternative view that allows us to see the woman in the China Girl image without fetishizing her as part of cinema's material constitution. Such a view potentially separates the view the China Girl provides of the media it structures from the *look* of her as a woman: both in appearance and, possibly, as a woman who looks. This alternate view might be possible by reshaping and in some cases denaturing the relation between the China Girl and its materiality whether in film or digital media. Such a view would offer a way of looking back onto the media through which they're formed.

Barbara Hammer's *Sanctus* (1990) turns the China Girl toward more explicitly feminist aims. The film begins and ends with images of a Kodak LAD girl. This is the only face we see clearly in the film, though others are suggested in the image of fleshy shadows on X-rayed skulls. In between the LAD shots, the rest of the film consists of optically printed and manipulated footage of X-ray cinematography shot in the 1950s by James Sibley Watson. Watson's film, as processed by Hammer, depicts the human body decoded by the X-ray camera and recoded by gender signifiers, as when a skeletal figure applies lipstick. The framing structure of the LAD girl is analogous to the way China Girls appear on countdown leader; it is as if Hammer were showing not just the length of her film but the entire filmstrip on which it is printed. At these extended ends, we see also sprocket holes that signal the foundness of the footage Hammer reworks.

Both the China Girl and the X-rayed figures suggest an economy of the invisible made visible, of invisible bodies coming into view: The China Girl is usually situated on the unseen margins of a film, while the X-ray images show the body's interior structure on its surface. Through superimposition, the film suggests a more direct correlation between these two figures as well. In cinema, the China Girl's face functions like a skeletal structure. We can even imagine that the China Girl's face belongs to the X-rayed figures onscreen; they form different parts of the same repressed body, or what Akira Mizuta Lippit, writing on X-ray photography, calls "a repressed corporeality."<sup>35</sup> On her own, neither X-ray figure nor China Girl forms a "whole" woman, but layered on top of each other, and tellingly matched at the overlapped place of their eyes, they begin to reconstitute a body in and through the material of film.

35. Lippit has called Freud's dream of Irma's injection, analogous to the X-ray image, a "repressed corporeality." *Atomic Light (Shadow Optics)* (Minneapolis: University of Minnesota Press, 2005), p. 39.





*Sandra Gibson and Luis Recoder.*  
*A Sourceful of Secrets. 2002–2012.*

The reconstituted corporeality, however, is left incomplete. At the end of *Sanctus*, the image burns, the destructive force of the X-ray visualized onto the skin of the film. This act of burning forms the central event in *A Sourceful of Secrets*, a projection performance by Sandra Gibson and Luis Recoder. The work as it was performed at Anthology Film Archives in November 2012 consisted of two projectors, one 35mm and one 16mm. Over a digital audio score of birdsong and deep rumbling sounds, Gibson and Recoder placed colored gels and water sprayed on the projection-booth glass before the 35mm projector, while the 16mm projector was fed strips of China Girl leader. The artists held the filmstrips there, still, as the China Girl images burned from the heat of the projector lamps. (Ordinarily, of course, film doesn't burn, because it moves too quickly through the projector.) These fiery images appeared onscreen, overlaid with the watery abstractions coming from the 35mm projector. After burning through several China Girls, the artists concluded the performance.

*A Sourceful of Secrets* not only depicts but also enacts the China Girl's material dissolution. While the other films I have discussed have aimed in one way or another to make the China Girl visible, this performance presents us with another kind of view of the China Girl: the image of its destruction. The scorched image, or face, in *A Sourceful of Secrets* reveals an opening, a hole through which the light of the projector shines. Here this goes beyond *Sanctus's* metaphoric destruction,

wrought by irradiating light, and gestures toward the point at which new images, images not constrained by the cinematic apparatus, might be generated. Even as they burn in *A Sourceful of Secrets*, the China Girl images suggest a continued path to a place beyond the filmstrip. In her discussions of a politics of the post-colonial other, Trinh T. Minh-ha has argued, “The space of creativity is the space whose occupancy invites other occupancies. . . . Thus, if she [and here Trinh means the other] negates, it is also to refute negation—joyfully.”<sup>36</sup> Out of this negation, the ashes of the image, arises a space through which the politics of the visible might be expressed. On a broader level, we might understand the rise of digital technologies, which have largely replaced analog film in contemporary moving-image production, as a new medium to emerge from the scene of cinematic disaster. Cécile Fontaine’s digital video *China Girl* (2010) uses scanned images of several 35mm China Girl frames and deforms them through animation, slow motion, and mirroring effects. In this film, the China Girl, the same LAD used in Hammer’s *Sanctus*, is rendered barely recognizable.



Cécile Fontaine. *China Girl*. 2010.

On a technical level, the mirroring of the image has the effect of multiplying, layering, and animating the single image. Instead of the fragility of the film frame, we’re presented with digital fluidity and algorithmic multiplicity. The work denatures the material of the China Girl image, specifically its physical basis, by digitally re-sequencing or reconstituting it. For some, this might register as digital immateriality, though such a view offers too narrow an understanding of what technological materiality can mean or is too constrained by a filmically derived notion of materiality. The term *post-cinematic*, in this sense, is an especially myopic view, relegating anything that appears after cinema as ghostly. Fontaine’s digital China Girl occasions a different view: that digital media are imbued with their own materiality and cultural logic related to but not overdetermined by cinema.

One question that arises in the wake of structural film is whether China Girls, whenever they appear in a film, are always “about” film and filmic materiality, or whether they are always emblems for film and film only. The intermedial mix of film and digital images in Fontaine’s video, while it clearly suggests the endurance of filmic materiality within a digital context, also offers a way of conceiving the China Girl from the perspective of digital media. To the extent that Fontaine’s *China Girl* is “about” its medium, it is from the perspective of the technical process it describes: telecine recording from film to video to produce a digital intermediate (or DI). In industrial terms, the intermediate suggests that a film, scanned and

36. Trinh T. Minh-ha, “World as Foreign Land,” in *When the Moon Waxes Red: Representation, Gender and Cultural Politics* (London: Routledge, 1991), p. 187.

manipulated digitally, will eventually be outputted as something else: recorded to film or, as is becoming increasingly common, outputted as a DCP or some other digital file. A DI indicates the transformation, or the mutation, of film into another form: something that exists not only in the wake of film, of filmic materiality, but offers perhaps a new materiality. In other words, Fontaine's video may be less a ghostly afterlife—an After Effect—of film translated into pixels than a new materiality singularly constituted in digital terms.

While the China Girl is rooted in practices associated with film, especially in its linking of femininity and materiality, Fontaine's video demonstrates how the figure can also function emblematically for digital technologies as well. If China Girls, in their celluloid incarnations, told us something about the physical and chemical processes that attend the processing and printing of film images, then the digital China Girl, as a structural unit, offers a way of looking at the history of cinema from the perspective of new media.

The China Girl can thus be considered structural not just from a film perspective but also a digital one. Yet the problem that plagued structural filmmakers in the '70s recurs in contemporary media as well: the problem that such structural elements inevitably also have content. Content, as David James argues, is not incidental, as when he describes the woman in Land's *Film in Which There Appear. . .*:

The representation of the female model does engage issues of spectatorship that are continuous with the dominant issues of the film: for instance, her profession is to be looked at, but here she will alternately be overlooked by and look at us.<sup>37</sup>

In film, the China Girl highlights the disjunction between the women onscreen, whose images are given to be seen, and the women behind the scenes who are not meant to be seen at all. She is constitutive of cinema's system of representation, but largely excluded from it. In digital media, the China Girl is similarly obscured by the processes that depend on her image—chiefly monitor calibration and other forms of image adjustment—and in these ways the China Girl is subsumed into software, immaterial to the extent that there is no longer a physical artifact to grasp. With digital production and projection, the incidental view of a China Girl during a screening is no longer possible. Fontaine's continually morphing image, a familiar face made strange, reminds us of the transmutation not only of the image onscreen but the entire process by which films are made and exhibited in a digital context. Yet the China Girl need not be allied to either film or digital media. Rather, she offers a compelling opportunity to examine the two media as they are related historically, materially, and technically as a form of intermedial archaeology. One of the most recent films to feature the China Girl returns to celluloid and to the tradition of China Girl uses in experimental film, *Releasing*

37. David E. James, *Allegories of Cinema: American Film in the Sixties* (Princeton: Princeton University Press, 1989), p. 245.



*Lili Young, China Girl  
at DuArt. C. 1968.*

*Human Energies*, made by filmmaker and archivist Mark Toscano.<sup>38</sup> For a little over five minutes, the China Girl sits in real time, visibly uncomfortable and blinking. Her smile occasionally brightens, as she was apparently being directed offscreen to keep smiling. The woman's discomfort is underscored by the narration of Morgan Fisher, who once again speaks over the image of a China Girl. As the woman fidgets slightly, we hear him read aloud motivational passages from a 1955 instructional manual called *The Management of People in Restaurants, Hotels, and Clubs*. Against his exhortations for effective managers to "release their human energies," the awkward posture of the China Girl reminds us that this injunction is denied to many whose tedious labor is much less human than it is instrumental.

38. I owe a debt of gratitude to Toscano, since he was the one who first brought the China Girl to my attention when, during a workshop on moving images organized by Tom Gunning at the Getty Research Institute in 2009, he showed a 16mm camera original reel of China Girl footage that had been donated to the Academy Film Archive in Los Angeles. Toscano later used this same footage for *Releasing Human Energies*.

The stretch of uninterrupted time provides a clear view of the China Girl's movement. It is very unlike the brief glimpses and frozen bodies more commonly associated with the China Girl as it has been rendered filmically and digitally.<sup>39</sup> While on one level the experience of watching the reel is similar to that of a Warhol Screen Test, the knowledge that this found fragment originally came from an industrial source restores a sense of labor and endurance, of life itself, to the China Girl. This woman is there not merely to look pretty but must suppress her movements, doll-like, and become a picture for our prolonged pleasure. The film preserves a persistent temporality, along with the China Girl's sense of twitchy struggle, and we might consider it the insistent wholeness of the China Girl before she is adopted for technical use. As Lili Young, a former China Girl model I interviewed, described her experience posing, "It was not a very exciting thing to do, you know. Just sit and be very still. Expressionless. . . . They just wanted my flesh tone. . . . It was like being in a long still shot, forever."

39. See especially Michelle Silva's *China Girls* (2006), in which whole lengths of leader containing momentary glimpses of China Girl frames are spliced together. Silva sought to depict China Girls as they appear "in the wild," which is to say in brief, three-to-six-frame bursts.