THREE

Situated Technology: Meanings

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McGaw and Oldenziel both demonstrate the range of objects falling under the broad rubric of technology and highlight the extent of technological knowledge necessary to make such objects useful, desirable, or profitable. Their discussions remind us of the importance of human agency—users as well as designers—in understanding technological change, and thus of the need to examine various human ideas about what they (and others) want to accomplish in the material world.

Rebecca Herzig asks us to consider not only what technology is but also what things people choose to make and do, in which contexts, and why. Her article explores a now-familiar medical technology—the x-ray machine—sought out by women for what is now an unexpected purpose: facial hair removal. Radiation effectively causes hair loss, albeit with some risk. Hair loss—or hair removal, depending on one's perspective (and generally on the location of the hair in question)—carries highly gendered meanings, and highly racialized ones as well. For the women she studies, these meanings were potent enough to overcome the risks involved in x-ray hair removal. Why, according to Herzig, was hair removal so important to these women at this time? How, in Herzig's portrayal, does gender shape technology? How does technology in turn shape and maintain gender ideologies and gendered identities?

"Removing Roots: 'North American Hiroshima Maidens' and the X-Ray," *Technology and Culture* 40, no. 4 (1999): 723–45. Reprinted by permission of the Society for the History of Technology.

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On 25 February 1940, an officer with the San Francisco police department's homicide detail reported a "rather suspicious business" operating in the city. At 126 Jackson Street sat an old, three-story rooming house, recently leased by Dr. Henri F. St. Pierre of the Dermic Laboratories. As Assistant Special Agent J. W. Williams later described the scene, "women had been seen entering the place from the Jackson Street side at various times of the day, subsequently leaving by . . . an alley at the rear of the building. Following the arrival of the women, cars would arrive with a man carrying a case resembling . . . a doctor's kit. They would also enter the building for a short time, come out, and drive away. . . ."[1] At first sight, the medical kit, the furtive departures, and the seedy locale all signaled to Williams that St. Pierre was running a "new abortion parlor."[2] As it turned out, however, "the so-called 'Dr.'" was offering a somewhat different service to these women: the removal of their unwanted body hair through prolonged exposure to X rays.

At the time of Williams's writing the practice of removing hair with x-radiation was thoroughly disreputable—if not illegal—in most of North America. By 1940, health officials and X-ray clients had long since realized that intense doses of ionizing radiation not only removed hair, but also led to other, dangerous physiological changes. Articles lambasting the potentially lethal practice had been appearing regularly in medical journals and popular magazines since the early 1920s, and these articles only became more graphic with the passage of time. In 1947, an article in the *Journal of the American Medical Association* described in gruesome detail dozens of cases of cancer resulting from depilatory applications of x-radiation.[3] In 1970, a team of researchers found that more than 35 percent of all radiation-induced cancer in women could be traced to X-ray hair removal.[4] In 1989, two Canadian physicians suggested a new name for the widespread pattern of scarring, ulceration, cancer, and death that affected former epilation clients: "North American Hiroshima maiden syndrome."[5]

Although physicians might now liken X-ray hair removal to international atomic attack, the analogy obscures several of the most crucial aspects of the history of this technology. To begin, unlike the famous "Hiroshima Maidens" (twenty-five young bomb survivors brought to the U.S. for plastic surgery in 1955),

epilation clients were anything but the unsuspecting targets of foreign military action.[6] As Williams's 1940 description of back-alley hair removal makes clear, these individuals were not "passive victims" but willing participants in the diffusion and persistence of a controversial technology.[7] Moreover, unlike the atomic explosions that punctuated the summer of 1945, X-ray hair removal was not a dramatic aberration in the history of technology. Rather, from its first use among professional physicians in 1898 through its slow demise in the late 1940s, X-ray epilation enjoyed nearly fifty years of continuous practice. One 1947 investigation concluded that thousands of Americans visited a single X-ray hair removal company, the Tricho Sales Corporation.[8] Since Tricho was just one of dozens of similar X-ray epilation companies in operation in the 1920s and 1930s, one can conclude that tens of thousands—if not hundreds of thousands—of other American women also irradiated themselves in order to remove unwanted body hair.[9]

Rather than focusing on the eventual physiological impacts of X-ray epilation, a tragic story already told in meticulous detail by medical reports, this article explores the circumstances in which prolonged, repeated self-irradiation seemed appealing to its myriad users and promoters. Understanding the practice's allure requires consideration of two questions: first, why did so many early-twentieth-century American women wish to remove their body hair? Second, why would some women choose the X ray over other available hair removal technologies? The answers to these questions, we will see, quickly lead from X rays and hair to larger problems of race, sex, and science in the interwar period.

The Emergence of "Superfluous" Hair

The manipulation of human body hair has a long and rich history. Like teeth and foreskin, hair has been removed according to prevailing social custom for millennia.[10] Yet if unwanted hair and techniques for its removal have been around—in the words of one commentator—since "hoary antiquity," the years after 1870 saw an increasing fascination with "superfluous" hair in the United States.[11] In the wake of Darwin, body hair became newly invested with evolutionary significance and attendant questions of racial and sexual difference.[12] Changing patterns of immigration stimulated further attention to comparative physiognomy, while shifting economic and political roles for white, middle- and upper-class women provoked particular interest in "woman's" proper physical appearance.[13] The establishment of the American Dermatological Association in 1877 created a professional medical niche for the study and treatment of *hypertrichosis,* the condition of excessive body hair thought to be most troubling among young white women.[14] As excessive hair became increasingly identified with individual pathology, the threat of transgressed sexual roles, and racial atavism, new medical and popular energy was devoted to "remedying the evil" of superfluous hair.[15]

Scientific and popular fascination with excessive hair expanded still further between the two world wars. In the years between 1914 and 1945, as historian Christine Hope has demonstrated, popular U.S. women's magazines increasingly promoted models of hairless, white feminine beauty.[16] As ideals of smooth, white skin spread through the nation's periodicals, some American women developed new anxiety about hair growth. A number of these conveyed their mounting apprehension about body hair to popular magazine editors, beauty experts, and health advisors.[17] Medical practitioners also noted the intensity of women's concern, describing the severe depression, self-imposed seclusion, and nausea common to those "afflicted" with superfluous hair.[18] Physician Paul Bechet recalled one typical patient who "gave up a very lucrative position, shunned all her acquaintances, refused to go out unless heavily veiled, and slowly drifted into true melancholia" due to her hairy condition.[19] Others described patients who considered (or accomplished) escaping their misery through suicide.[20] Struggling to accommodate intensified ideals of hairlessness, many American women began to strip their body hair, removing the troubling growth from arms, legs, faces, armpits, breasts, buttocks, and pubic regions. By 1938, one expert could declare without sarcasm that any hair not on a woman's scalp was rightly considered "excessive."[21]

Such newly stringent norms of feminine hairlessness expressed changing cultural understandings of race. In the United States, where questions of racial identity have long focused on perceived morphological characteristics, discussions of physical appearance carry particular histories of race and racism.[22] Like skin color, body hair has long been central to perceptions of human variation, and concern with hair, hair growth, and hair manipulation often mirrors more general attitudes toward race and racial difference.[23] In the nineteenth century, for instance, most published discussions of human hair reflected a larger interest in the recognition and classification of distinct races, as evident in Peter A. Browne's 1853 *Trichologia Mammalium.* In this elaborate treatise, Browne delineates "three distinct species of human beings" based on differences in the quality of hair types.[24] Browne describes new instruments—the trichometer, the discotome, and the hair revolver—designed to divulge and quantify these fixed somatic differences. Other

North American and European naturalists similarly measured human hair growth in order to elucidate racial taxonomies. The measurement, classification, and manipulation of human body hair, in short, enabled and upheld nineteenth-century taxonomic understandings of race.[25]

By the 1920s and 1930s, nineteenth-century efforts to define stable, distinct racial categories had shifted to apprehension about racial mutability and blending. "White" was no distinct and fixed category of human being, but an identity that required maintenance and display. Concerns about hair shifted accordingly. Amid new discussions of immigration, racial degeneration, and "passing," women's body hair came to signify both the promise and threat of slippery racial boundaries. Some beauty advisors began to underscore the racial significance of body hair, emphasizing the importance of a pale, hairless complexion.[26] Physicians treating hypertrichosis similarly began to focus their attention on the racial characteristics of the disease. While debating environmental, gonadal, and psychological influences on "excessive" hair growth, most concluded that the ailment pointed to subtle, underlying racial differences. As Ernest L. McEwen concluded, "heredity is the most frequent etiological factor. The condition is seen very often in several members of the same family, and may be traced in the lateral branches of the same stock. A racial tendency is observable, notably in those of Jewish and Celtic extraction."[27] Emerging in a period of widespread anxiety about racial mixing and racial discrimination, commercial hair removal salons echoed popular and medical opinion on the value of "smooth, white, velvety skin," linking the eradication of hair to the eradication of "troubling" racial markers.[28]

While the emergence of new norms of hairless, white femininity helps account for some women's increasing interest in hair removal, these norms alone do not explain the prevalence of the specific technique of X-ray hair removal. Although dozens of other feasible hair removal technologies were readily available during the interwar period, thousands of American women sought this particular method of epilation. Indeed, clients continued to pursue X-ray hair removal even as the practice was denounced in popular women's magazines and assailed by medical and legal authorities.[29] While not all women remained committed to the technique once learning of its dangers, X-ray epilation persisted even after the practice's formal prohibition, as Assistant Special Agent Williams's report on the surreptitious activities at 126 Jackson Street demonstrates.[30] In the context of a widespread cultural demand for feminine hairlessness, how might we account for the peculiar popularity of hair removal with the X ray?

Selling the Imperceptible

To understand the enduring and widespread appeal of X-ray epilation, we must begin where consumers of the time would have: with a comparison between the X ray and other available hair removal technologies. During the 1920s and 1930s, a woman with unwanted body hair had a variety of temporary solutions at her disposal. Abrasives such as fine-grained pumice stone, sugar-paste solutions, or so-called "Velvet Mittens" made from sandpaper all depilated hair at the surface of the skin, but were expensive and likely to lead to skin irritation and scabbing.[31] Razors of various types could also be used to remove hair at the skin's surface, yet several commentators noted the distaste women had for shaving themselves, particularly for shaving their facial hair.[32] Since tweezing hairs individually frequently proved too time-consuming and too painful for densely covered areas, modified shoemaker's waxes were used to rip off large patches of enmeshed hair in a single motion. Waxes, too, remained expensive and painful to use.[33]

Chemical depilatories were also available, ranging from ineffective peroxides through irritating, foul-smelling sulfides to the outright lethal thallium acetate solution known as Koremlu.[34] These hair removers were not only hazardous but also caused significant discomfort to the user. One physician, H. L. Baer, speculated that the pain associated with chemical depilatories was not limited to the location of hair removal, but might also be transmitted "along the branches of the facial nerve to the teeth and the tongue," where metallic fillings and bridgework may help "to conduct the nerve current of the pain." Baer advocated the placement of a wooden barrier between the teeth of the patient during chemical epilation, thus "interrupting the transmission of this nerve current."[35] As a final method for the temporary removal of hair from the root, at least one specialist recommended a procedure known as "punching." With this technique, a slender cylindrical knife was inserted through the cutis around the hair shaft and immediately withdrawn, leaving a severed column of skin containing the hair-root. Punching was never one of the more popular methods of epilation.[36]

Each of these methods of epilation, although generally effective, provided only temporary relief from superfluous hair, since the follicle itself often remained intact and capable of still further hair growth. For a more lasting effect, women of means might try diathermy or electrolysis—complicated, expensive procedures typically practiced outside the home by experienced specialists.[37] Technically, dia-

thermy and electrolysis were quite similar. First, a slender needle charged by a galvanic battery was inserted directly into the hair shaft. The electrical circuit was then closed and a slight bubbling at the skin's surface was produced as both the hair root and surrounding tissues were blanched. The roasted hair was then easily removed with "epilation forceps" (more commonly known as tweezers). Unlike razors, waxes, or other hand tools, diathermy and electrolysis both involved contact between the woman, a separate, skilled operator, and sophisticated, spark-snapping machinery (fig. 3.1). The techniques required not only meticulous attention and skill on the part of the operator but also extreme patience and tolerance for pain on the part of the client. Indeed, since the client was often responsible for completing the electrical circuit by grasping an electrode of the machine, her fortitude enabled the very functioning of the apparatus.[38] As one physician described the Kafkaesque procedure: "When the needle is inserted the patient is directed to touch the electrode. She naturally touches it first with the end of one finger, adding gradually another one, till all five fingers are in contact with the handle, ready to grasp the handle with the full palm, if necessary, thus controlling by her own action the degree of intensity of the current."[39] In order to ensure the full intensity of the current and thus the full efficacy of the treatment, occasionally anesthetics such as cocaine were necessary to help the client become "hardened" to her task.[40]

Compared to these methods of epilation, the new rays offered several distinct advantages. To begin with, they were undeniably effective at removing hair.[41] Even the American Medical Association's Bureau of Investigation—one of the staunchest opponents of X-ray hair removal—grudgingly admitted the amazing results achieved with this technique.[42] More importantly, the rays bypassed the inescapable physicality of all other hair removal technologies. Appropriately named "X" by Roentgen in recognition of their enigmatic nature, the rays were alluringly imperceptible. Gone were the noxious smells of depilatories, the root-ripping pain of hot waxes, and the frightful appearance of multiple electrolysis needles. In the most popular commercial hair removal chain, Albert C. Geyser's Tricho salons, the client was seated before a large mahogany box containing the X-ray equipment (fig. 3.2).[43] A metal applicator the shape and size of the area to be treated was adjusted to the box's small front window, and the turning of a switch started the operation. The X-ray equipment itself was visible to the user only through a small window in the front of the machine, and the machine shut off automatically after the appropriate period of exposure, usually three to four minutes.[44] The

Figure 3.1. Electrologist and client, demonstrating the multiple needle technique. (Delmar E. Bordeaux, *Superfluous Hair, Its Causes and Removal* [Rockford, Ill., 1942], 48. Reproduced with permission of the American Medical Association.)

client might hear the sounds of electrical generation or detect an odd ozone smell, but the epilating rays themselves were clean, quiet, invisible, and mysterious.

Commercial salons seized on the imperceptible nature of the rays as their primary selling point, and eagerly perpetuated the promise of effortless self-fashioning available with the X ray. As one epilation pamphlet assured, "The woman being treated absolutely does not feel, hear, or see the action of the ray."[45] Or, as a number of advertisements summarized the experience, "Nothing but a ray of light touches you."[46] Not only would the gentle new light banish hair, the promotions further

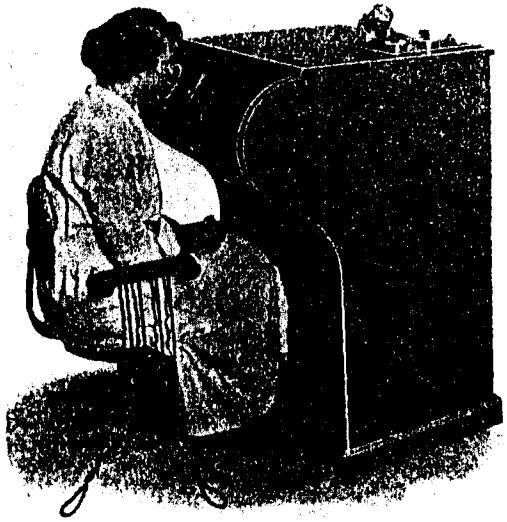

Figure 3.2. Albert C. Geyser's Tricho Machine, with automatic timer. (Reproduced with permission of the American Medical Association.)

emphasized, but also the messy, smelly, time-consuming labor once required for its removal. Hand tools such as tweezers and sandpaper were described as "Antiquated Methods," rudimentary vestiges of a painful, toilsome past happily superseded.[47] One Boston newspaper advertisement urged prospective clients to think of the "joy of freedom from depilatories or razors" possible with the X ray.[48] The theme of women's emancipation from routine work was reiterated in a pamphlet from a Tricho salon in Detroit, which concluded simply: "It is no longer necessary for any woman to resort to the old makeshifts, since science has shown the perfect way."[49]

The "Science" of X-Ray Epilation

The ray's imperceptibility augmented an equally crucial aspect of its popularity: its association with "science." Like countless other early Progressive-era businesses, hair removal salons learned that references to "science" both piqued customers' interest and provided the enterprise with an aura of legitimacy.[50] Rhetorically appropriating this aura, salon operators made frequent references to the "scientific" methods and equipment used in their establishments, and to the "scientifically-sound principles" on which their epilation process was based. Yet unlike many other early-twentieth-century businesses, the salons' references to science were not simply spurious. To consider the relations between science and X-ray epilation, we must return to its origins in nineteenth-century physical research.

The hair-removing properties of X rays were discovered accidentally by two Vanderbilt University researchers in 1896, within weeks of Roentgen's first public announcement of the "new kind of light."[51] In March of that year, researchers John Daniel and William L. Dudley were asked to locate a bullet in the head of a wounded child. As Daniel later recalled the chain of events, Dudley, "with his characteristic devotion to the cause of science," agreed to lend himself to an experiment with skull X rays. Twenty-one days after Dudley's head had been exposed for an hour with the tube placed half an inch from his scalp, Daniel reported that all hair had fallen out from the area held closest to the tube.[52] Word of the researcher's new bald spot spurred substantial "editorial merriment. . . . [T]here were even suggestions in the newspapers and technical journals that the X rays might render daily shaving obsolete."[53]

Soon after these merry speculations, professional physicians began to experiment with the X ray in the treatment of hypertrichosis. In 1898, two Viennese dermatologists, Eduard Schiff and Leopold Freund, published the first good results of this medical therapy.[54] On the heels of their success, scores of dermatologists, roentgenologists, and other physicians in both Europe and North America adopted the effective new treatment.[55] By 1910, one specialist declared that the "electric needle, formerly so prevalent, but tedious and painful in operation, has largely given way to the X-rays."[56]

In fact, medical use of the electric needle never actually gave way to X-ray epilation. Some European and North American physicians continued to use X rays well into the 1920s to remove hair from skin intended for grafts or on skin affected by ringworm, but most U.S. physicians had grown reluctant to use the X ray for other hair removal even before the First World War.[57] Why would physicians decide to abandon the highly effective (and lucrative) practice of X-ray epilation?

To be sure, American physicians' abandonment of X-ray epilation stemmed partly from their increasing recognition of radiation risk. As time provided further evidence of the latent effects of X-ray exposure, physicians grew loathe to expose their patients to the hazards of the ray.[58] Concern for radiation risk alone,

however, does not account for physicians' eventual disavowal of X-ray epilation. Scientists, technicians, and physicians had grown wary of radiation "burns" prior to widespread experimentation with X-ray hair removal, and their support for the technique continued even as they witnessed the destruction wrought on the bodies of X-ray "pioneers."[59] It would be difficult, therefore, to attribute physicians' increasing reluctance to treat superfluous hair with X rays solely to their sudden recognition of the effects of radiation on human tissue.

The decline of medical X-ray epilation in the 1910s reflected not only increasing awareness of radiation risk but also physicians' growing unwillingness to apply the prestigious new ray to "minor" concerns such as hypertrichosis. Definitions of "excessive" hairiness were maddeningly fluid, and the intractable ambiguity of the disease's diagnosis moved hypertrichosis to the contested border between "cosmetic" and "medical" concerns. Although most practitioners agreed that excessive hair was a matter of widespread public interest, hypertrichosis remained on the margins of professional therapeutics, the country cousin of more stately concerns such as cancer and tuberculosis.

The X ray, on the other hand, enjoyed unquestionable sovereignty as one of medicine's crowning achievements. Particularly in the wake of the damning 1910 Flexner report, American physicians grasped such achievements to shore up their troubled professional authority. For these physicians, the X ray played a crucial role not only in medical diagnostics and therapeutics but also in enhancing the status of the medical profession. As a result, physicians grew increasingly reluctant to use the X ray, a symbolically and materially potent therapy, on a problem that hovered on the fringes of professional respectability. Seeking to preserve the "scientific" clout of radiation therapy, many physicians sought to restrict its application.[60]

Accordingly, physicians pressured one another to resist patients' requests for X-ray epilation. One physician urged his fellows to resist the natural temptation to comply with patients' willingness to employ x-radiation, since their condition was a "cosmetic defect" rather than a "serious disease."[61] As another practitioner summarized, "It is not customary to shoot at sparrows with cannon-balls. Why, if we treat a hairy surface of the face of a fair lady, for instance, resort to means as powerful as those we employ in carcinoma?"[62] Through such admonitions, X-ray experts slowly recast hypertrichosis as "a purely cosmetic defect," superfluous to the proper domain of truly scientific therapeutics.[63]

As professionalizing physicians backed away from X-ray epilation in an effort revive medicine's troubled authority, commercial practitioners were quick to fulfill

demand for the therapy.[64] New commercial X-ray salons were opened not only by nonmedical beauty specialists but also by those physicians and scientists who had been squeezed out of reputable medical societies, professional publications, and other systems of collegial recognition due to their continued interest in X-ray hair removal. These practitioners easily presented clients with respectable diplomas and refereed publications testifying to their professional credentials. Their salons bore titles that alluded to the technique's scientific origins, such as "Hamomar Institute," "Kern Laboratories," "Hirsutic Laboratories," and the like. Commercial practitioners, in other words, emphasized the very same scientific aura physicians were attempting to define, protect, and control by disavowing this application of the ray. As professional scientists and physicians sought to prohibit X-ray epilation, they bolstered the technique's scientific prestige. The technique's popularity soared accordingly, and hundreds of X-ray salons opened across the country over the course of the next three decades.

The Triumph of Science over Superfluous Hair

While salon owners and managers promoted the X ray as the most "scientific" method of hair removal available, they never actually defined the term. Indeed, the ambiguity of "science" was perhaps its most marketable feature. Yet as loosely and broadly as science was defined in hair removal advertisements, it was quite systematically linked to a notion of progress. Whatever else science might have been, it was invariably and unceasingly advancing.[65] A brochure for the Virginia Laboratories of Baltimore emphasized the endless progress of science, noting that the thirty years of refinement of the X ray that had elapsed since Roentgen's discovery "can be said to be but a mere few minutes of time in the slow but certain development of knowledge." The advancement of science was further naturalized by likening it to the maturation of an awkward youngster. As the Baltimore salon put it, "great discoveries often go without much attention for a time, but inevitably they come into their own."[66]

Just as the epilation advertisements linked science to a notion of inexorable progress, that progress was in turn linked to the "strange power" of the X ray.[67] Science, accessible through the enigmatic new light, could now at last fulfill the dominant culture's "dream of faultless skin."[68] One 1933 brochure, paradoxically titled "Be Your True Self: We will tell you how," proclaimed: "Our MODERN SCIENTIFIC METHOD with filtered RAYS" is "not 'just another' hair remover," but the only one that can "banish" one's dark traces. As the brochure pledged, "It is only a step

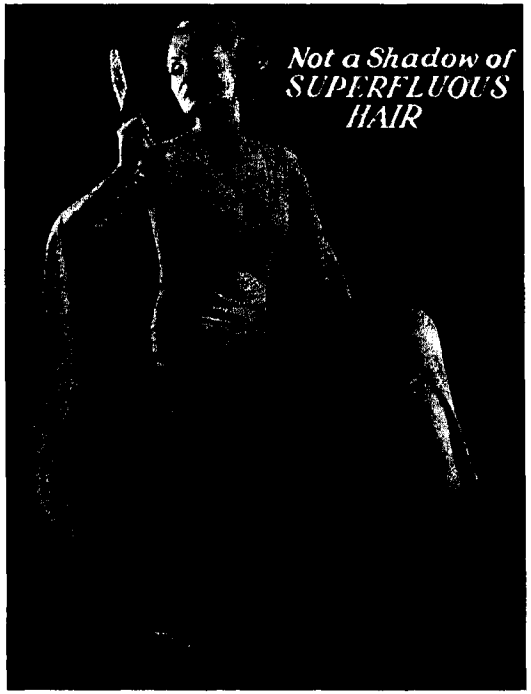

Figure 3.3. Advertisement for Vi-Ro-Gen, of Pittsburgh, ca. 1935. (Reproduced with permission of the American Medical Association.)

from the Shadow into the Sunshine."[69] The enlightenment offered by scientific knowledge and the woman's own visible, physical "enlightenment" were further entangled in one salon's letter to a prospective client: "Thanks to the progress of science, no woman need now endure the torture and selfconsciousness [*sic*] which a physical blemish causes."[70] Or, more ominously, "Whatever you do—wherever you go—you need to have your skin CLEARED from this dark shadow."[71] The inevitable progress of science, the brochures suggest, eliminates all darkness in its path. Scientific advancement yields personal, physiological transformation (fig. 3.3).

As a notion of scientific advancement was linked to somatic enlightenment, so too were both narratives linked to dreams of upward class mobility. Through plentiful photographs of plush consultation rooms and sleek treatment rooms, epilation promoters promised prospective clients a space unequaled in cleanliness and luxury.[72] Simply by stepping into the salon, claimed one testimonial, a woman was invited to experience the "padded carpets, the beautiful polychrome furniture, the soft shaded lights and dainty draperies, and . . . the quiet, restful atmosphere of . . . studious habits and refined tastes. . . . The epilation laboratory is a vision of sanitary loveliness. The place is done in pure white enamel, not an atom of dust can enter here."[73]

Many of these promotions made the economic importance of technological self-fashioning far more explicit. Prefaced by a drawing of a pale, well-dressed couple approaching a cap-wearing attendant, a Chicago Marveau Laboratories ad demanded, "Can you afford to neglect your personal appearance any longer, in this age when it counts so much in social and economic advancement?"[74] Similarly underscoring the sexual (and hence, economic) benefits of feminine hairlessness, the Dunsworth Laboratories of Indianapolis seconded this theme (fig. 3.4): "Freedom from Unwanted Hair Opens the Gates to Social Enjoyments that are Forever Closed to Those so Afflicted."[75] Cleanliness, science, and class mobility merged in the commodification of hair removal.

The salons knew their audience well. While it is impossible to determine the racial identities of the thousands of anonymous American X-ray clients, we do know that commercial epilation salons specifically distributed their promotions to urban, non-English-speaking populations, a fact noted by health officials seeking to warn the public about the practice.[76] Medical and legal records indicate that most epilation clients were working women employed in low- or middle-income positions: telephone operators, secretaries, clerks, and so on. Some former clients recalled receiving special group discounts at commercial salons for bringing in large numbers of friends or coworkers.[77] Such discounts must have been attractive, for even in the midst of the nation's worst depression, salons charged between five dollars and thirty dollars for a series of ten to forty treatments.[78] That thousands of working women struggled to save the vast sums necessary for these treatments points to the larger resonance of the epilation advertisements: the hope that personal, physical transformation might bring passage to new economic opportunities—to a world of "refined tastes." In the salons' promotions, a mist-enveloped "science" promised enlightenment at once somatic and social, with the X ray providing the purchasable avenue to both kinds of development.

Obviously, it is impossible to know exactly what role the advertisements' mul-

Figure 3.4. Advertisement for the Dermic Laboratories of San Francisco and Los Angeles, ca. 1931. (Reproduced with permission of the American Medical Association.)

tiple allusions to racial transformation and class mobility played in the lives of the particular individuals who sought access to X-ray hair removal. Yet removing the "dark shadow" that barred access to the world of "social enjoyments" appears to have acquired a certain urgency during the interwar period, an era of increasingly restrictive U.S. immigration laws, widespread interest in eugenics, and increasingly desperate economic depression.[79] While women rarely address race explicitly in their letters about hair, they frequently connected their "affliction" to broader economic and social concerns. In one young woman's letter to the American Medical Association (AMA), for example, anxiety about her financial malaise and anxiety about her excessive hair flow into one another. Describing her frustration at the expense of epilation treatments, the stenographer from Philadelphia concluded, "I am ever so anxious to find a cure for this affliction. This has been the cause of much unhappiness and actual sorrow to me."[80] Obviously troubled

by the "considerable sum" she had already exhausted on X-ray epilation, twenty-five-year-old Anne Steiman expressed similar concerns from Brooklyn in 1933:

> I am working for quite a small salary now and I have saved every penny I possibly could. denying myself luxuries that all girls love toward trying to get rid of this unwanted hair, and believe me that saving this money was quite an effort as things at home are quite bad.
>
> But, I cannot go on as I am now, as I am miserable through a freak of nature and I have more than once thought of putting an end to my misery.[81]

Steiman and other young women of the nation's urban working poor could scarcely afford to ignore the possibility of economic uplift seemingly carried by a "complexion clear and fair."[82]

The few existing traces of women's explicit responses to epilation advertisements suggest that consumers were in fact impressed by the promotions' themes of advancement. When writing to beauty specialists and medical experts for advice on the X ray, women often referred directly to advertisements that they had clipped and attached to their letters. One woman summarized the mood of these letters when writing to the AMA in 1931. Under the headline of a brochure from Philadelphia's Cosmique Laboratories, Katherine Moore asked simply, "Doesn't this sound pretty good?"[83]

The End of X-Ray Epilation

Clearly, the X ray did sound good, not only to Katherine Moore and to Anne Steiman but also to the women who would, nearly a decade later, sneak access to the technology in the old San Francisco rooming house. Assistant Special Agent Williams's confusion there between X-ray hair removal and back-alley abortion is illuminating, for it reminds us that however irrelevant or ridiculous the subject of hair removal may appear to readers today, for many women in the interwar period epilation was nothing less than a matter of life and death. While we can never know definitively why some individuals chose this technology from among the numerous others then available, two dominant themes in the cultural representations of the X ray—its suprasensuality and its association with scientific progress—suggest that the act of removing roots had more than one meaning for these women.

These meanings, of course, would change with the passage of time. By the late 1940s the practice of X-ray epilation had largely, though not completely, vanished.

The demise of X-ray epilation could be explained in various ways. On the broadest level, one might take into account shifting commitments to ideals of whiteness. Particularly after the atrocities of the Nazi eugenic program, white Americans were forced to reexamine their malignant veneration of racial purity.[84] The reevaluation of radiation risk in the aftermath of the bombing of Hiroshima and Nagasaki further tarnished the appeal of X-ray salons.[85]

While such major events abetted the demise of X-ray epilation, the end of the practice ultimately stemmed from persistent local activism. Opponents of X-ray epilation, including local and national Better Business Bureaus, local and state Departments of Health, Boards of Medical Examiners, women's magazine editors, and law enforcement agents, attacked the practice on multiple fronts throughout the 1930s. Some physicians lobbied for the revision of existing Medical Practices Acts, which had overlooked the unlicensed use of electrical devices in the treatment of superfluous hair, while others swayed X-ray manufacturers to stop production of commercial epilation equipment altogether.[86] Local Better Business Bureaus pressured daily papers to refuse advertisements for X-ray hair removal, while metropolitan health officials used radio announcements to warn illiterate consumers of the dangers of the practice.[87] The increasing prominence of severely disfigured or dying epilation clients and their retributive claims against epilation providers must have also lessened the popularity of the procedure.[88] By 1940 the practice had been driven out of the formal sector of the American economy, surviving primarily in surreptitious venues like the old rooming house at 126 Jackson.[89]

Fifty years after San Francisco police closed down operations on Jackson Street, several lessons emerge from the history of X-ray epilation. To begin with, we are reminded once again to shift attention from dramatic, singular events, such as the bombing of Hiroshima, toward more mundane, yet equally significant, uses of technology. As Ruth Schwartz Cowan argued persuasively more than twenty years ago, thinking only in "grandiose terms" about technological change often obstructs our view of the radical developments "going on right under our noses."[90] Turning to hair removal, a subject quite literally right under our noses, helps indicate a lacuna in mainstream technological history: the ongoing production of "whiteness." The making of race, this example demonstrates, is a symbolic and material process, one that merits further consideration by historians of technology.

As X-ray epilation demonstrates the role of race in histories of technology, so, too, does it demonstrate the centrality of technology in histories of race. Historians, literary critics, and philosophers have increasingly examined the construction or materialization of race and racial difference in early-twentieth-century narratives such as Nella Larson's 1929 *Passing* and George Schuyler's 1931 *Black No More*.[91] To date, however, little attention has been paid to the actual technologies used to produce "race" in this period of U.S. history. Even as they describe the mutability of race in interwar America, scholars continue to neglect the artifacts that render race visible or invisible.[92] The X ray was particularly central in this respect, used not only to eradicate some women's "dark shadows" but also to sterilize "undesirables" and to permanently lighten the skin of some African American men.[93] Further scrutiny of such technological practices can only expand our understanding of race's deadly effects, and thus increase our ability to counter them.

But perhaps the most haunting lesson of the North American Hiroshima Maidens lies in the persistent faith in scientific progress evident among survivors of X-ray epilation. Even while coming to terms with their scarred and twisted bodies, many X-ray epilation clients held on to their belief in the special, personal promise of science. Their faith is captured in the 1954 words of a former Tricho client:

> The treatments were supposed to have been guaranteed, but within the last few year's 'white spots' have appeared on my chin. This has been very heart breaking to me especially when on one's face.
>
> I have been wondering if ther might possibly be some new medical discovery which might help me. There are so many wonderful things happening these day's.[94]

Despite experiencing the dire physiological effects of attempts to reform bodies rather than social structures, some clients continued to seek personal salvation in the advancement of science. Their persistence, their hope in finding such salvation, seems the most bittersweet message of this story.

NOTES

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1. J. W. Williams to C. B. Pinkham, memorandum, 2 March 1940, folder 0317-01, American Medical Association Historical Health Fraud Collection, Chicago (hereafter cited as AMA).

2. Ibid.

3. A. C. Cipollaro and M. B. Einhorn, "Use of X-Rays for Treatment of Hypertrichosis is Dangerous," *Journal of the American Medical Association* 135 (11 October 1947): 350.

4. H. Martin et al., "Radiation-Induced Skin Cancer of the Head and Neck," *Cancer* 25 (1970): 61–71.

5. Irving B. Rosen and Paul G. Walfish, "Sequelae of Radiation Facial Epilation (North American Hiroshima Maiden Syndrome)," *Surgery* 106 (December 1989): 946–50. The analogy between the twelve former epilation patients considered and the famous Hiroshima Maidens structures the physicians' presentation of the syndrome. The article opens, for example, not with a description of the twelve patients but with a description of the bombing of Hiroshima and its resultant "100,000 deaths" (946). It concludes by explaining how the epilation patients, "like their Japanese counterparts," managed to accept "their situation with fortitude and were able in most part to fashion a normal life" (950).

6. For further discussion of the original Hiroshima Maidens, see David Serlin, "Cut-Out Identities: Cosmetic Surgery and Cultural Imperialism," *Merge* 0 (1998): 46–50.

7. In this respect, X-ray hair removal devices might better be likened to cigarettes or tanning beds than to weapons of war. Judith A. McGaw's classic essay "No Passive Victims, No Separate Spheres: A Feminist Perspective on Technology's History" provides a cogent critique of "victim" approaches to the historiography of women and technology; see *In Context: History and the History of Technology,* ed. Stephen H. Cutcliffe and Robert C. Post (Bethlehem, Pa., 1989). For a more recent comment on feminist historiographies of technology, see Nina E. Lerman, Arwen Palmer Mohun, and Ruth Oldenziel, "Versatile Tools: Gender Analysis and the History of Technology," *Technology and Culture* 38 (1997): 1–8.

8. Cipollaro and Einhorn, 350. Tricho advertisements boasted that their method of hair removal had been used "by thousands of women long before the discovery was announced to the public," lending further indeterminacy to the number of individuals using X-ray epilation. See "The Tricho System," advertisement for George Hoppman's salon, Chicago, folder 0318-01, AMA.

9. While a few men used X-ray epilation for removal of hair from the face, ears, and neck, the vast majority of X-ray clients were women. Indeed, some men expressed concern that adopting this method of hair removal—a method marketed so strongly to women—might cause them to become "effeminate." See, e.g., Arthur Nelson to AMA, ca. 20 July 1934, folder 0317-01, AMA.

10. J. B. Loudon, "On Body Products," in *The Anthropology of the Body,* ed. John Blacking (London, 1977), 163. On the prevalence of hair removal in ancient Greece, for instance, see Martin Kilmer, "Genital Phobia and Depilation," *Journal of Hellenic Studies* 102 (1982): 104–12. For an account of contemporary white women's attitudes toward body hair, see Susan A. Basow, "The Hairless Ideal: Women and Their Body Hair," *Psychology of Women Quarterly* 15 (1991): 83–96.

11. Alfred F. Niemoeller, *Superfluous Hair and Its Removal* (New York, 1938), 14.

12. On the evolutionary significance of hair, see Londa Schiebinger, *Nature's Body: Gender and the Making of Modern Science* (Boston, 1993), and Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge, Mass., 1989).

13. Attitudes concerning immigration, race, and hair are exemplified in "Racial Characteristics of Hair," *Scientific American Supplement,* 10 March 1917, 160. On ideals of white middle-class feminine beauty, see Lois Banner, *American Beauty* (Chicago, 1983); Kathy Peiss, *Hope in a Jar: The Making of America's Beauty Culture* (New York, 1998); Vincent Vinikas, *Soft Soap, Hard Sell: American Hygiene in an Age of Advertisement* (Ames, Iowa, 1992).

14. For one of the earliest uses of the term "hypertrichosis," see C. Krebs, "Case of Hypertrichosis (Homo Hirsutus)," trans. H. J. Garrigues, *Archives of Dermatology* 5 (1878): 161–62. A partial bibliography of period dermatological articles on hypertrichosis can be found in L. Brocq, "Cent Dix Hypertrichoses Traitées Par L'Électrolyse," *Annales de Dermatologie et Syphilogie* 8 (1897): 1083–84.

15. George Henry Fox, "On the Permanent Removal of Hair by Electrolysis," *Medical Record* 15 (1879): 270.

16. Christine Hope, "Caucasian Female Body Hair and American Culture," *Journal of American Culture* 5 (Spring 1982): 93–99.

17. See, e.g., Marie Fink to AMA, 17 August 1931, folder 0317-02, AMA; Mrs. B. Tellef to AMA, 6 August 1926, folder 0318-01, AMA; Mrs. Allen Stamper to *Hygeia,* 4 November 1929, folder 0317-03, AMA; Joseph Rohrer, *Rohrer's Illustrated Book on Scientific Modern Beauty Culture* (New York, 1924), 46.

18. Herman Goodman, "The Problem of Excess Hair," *Hygeia* 8 (May 1930): 433; Maurice Costello, "How to Remove Superfluous Hair," *Hygeia* 18 (July 1940): 586; William J. Young, "Hypertrichosis and Its Treatment," *Kentucky Medical Journal* 18 (June 1920): 217; Oscar L. Levin, "Superfluous Hair," *Good Housekeeping,* September 1928, 106. While physicians and beauty specialists all reported the intense suffering endured by hairy women, the presence of body hair did not necessarily lead women to depression. At least a few women viewed their bountiful body hair as neither excessive, superfluous, nor merely tolerable, but instead as a beautiful complement to the rest of their physique. See, e.g., Joseph Mitchell, "Profiles: Lady Olga," *New Yorker,* 3 August 1940: 20–28.

19. Paul E. Bechet, "The Etiology and Treatment of Hypertrichosis," *New York Medical Journal* 98 (16 August 1913): 313.

20. Ironically, some X-ray epilation clients—such as "Mrs. E.B.," aged 30—were so upset by the atrophy and other effects of radiation poisoning, particularly if their hypertrichosis had been only "mild" in the first place, that they attempted suicide. See F. J. Eichenlaub, "Some More Tricho Cases," *Journal of the American Medical Association* 94 (26 April 1930): 1341.

21. Niemoeller (n. 11 above), 13.

22. Historian Evelynn M. Hammonds discusses the reliance of race on the visual in "New Technologies of Race," in *Processed Lives: Gender and Technology in Everyday Life,* ed. Jennifer Terry and Melodie Calvert (New York, 1997), 109.

23. As Kobena Mercer has put it, "the legacy of . . . biologizing and totalizing racism is

traced as a presence in everyday comments made about our hair" (249). See his extended argument about the racial significance of human hair, "Black Hair/Style Politics," in *Out There: Marginalization and Contemporary Culture*, ed. Russell Ferguson et al. (Cambridge, Mass., 1990): 247–64.

24. Peter A. Browne, *Trichologia Mammalium; or, A Treatise on the Organization, Properties and Uses of Hair and Wool* (Philadelphia, 1853), 66.

25. William Stanton, *The Leopard's Spots: Scientific Attitudes toward Race in America, 1815–1859* (Chicago, 1960), 150–54.

26. See, e.g., Delmar Emil Bordeaux, *Cosmetic Electrolysis and the Removal of Superfluous Hair* (Rockford, Ill., 1942); Anna Hazelton Delavan, "Superfluous Hair," *Good Housekeeping*, March 1925, 96. On the valorization of whiteness in dominant middle-class U.S. beauty discourse more generally, see Peiss (n. 13 above), 34.

27. Ernest L. McEwen, "The Problem of Hypertrichosis," *Journal of Cutaneous Diseases Including Syphilis* 35 (1917): 830. See also Frank Crozer Knowles, "Hypertrichiasis in Childhood: The So-Called 'Dog-Faced Boy,'" *Pennsylvania Medical Journal* 24 (March 1921): 403.

28. "Beauty is your Heritage," advertisement for Marveau Laboratories, Chicago, folder 0317-02, AMA; "With the Advancement of Science Comes the Modern Way to Remove Superfluous Hair Permanently: TRICHO SYSTEM," advertisement for Tricho salon, Boston, folder 0317-17, AMA; Albert C. Geyser, "Facts and Fallacies about the Removal of Superfluous Hair," folder 0317-17, AMA; "Loveliness for the Most Discriminating Women," advertisement for Hair-X Salon, Philadelphia, folder 0317-02, AMA.

29. Condemnations of the technique in women's magazines were vivid and unambiguous. In 1928, for instance, "skin specialist" Dr. Oscar Levin described the perils of X-ray hair removal to the readers of *Good Housekeeping*: "the skin may become inflamed, scaly, wrinkled, streaked with prominent blood vessels . . . at times, later in life, warty and scaly growths may appear, which finally break down and ulcerate, and may even become cancerous . . . the weight of expert opinion is against the use of x-rays or any type of radiation for destroying superfluous hair." See Levin (n. 18 above), 190–91. On clients' resistance to authorities' condemnations, see H. L. J. Marshall to AMA, 30 May 1928, folder 0318-02, AMA.

30. Some women sought medical advice on the X-ray treatments of superfluous hair, and upon hearing condemnation of the practice unhesitatingly rejected it. Others, already well informed on the potential dangers of X-ray overexposure, were blatantly misinformed about the nature of the technology by X-ray providers themselves. But these were a small minority among epilation clients. See, e.g., the case report from G. V. Stryker in "The Tricho System Again," *Journal of the American Medical Association* 92 (16 March 1929): 919; Mary Mulholland to AMA, 24 June 1930, folder 0318-02, AMA.

31. Advertisement for the Velvet Mitten Company, Los Angeles, folder 0317-01, AMA; Albert Geyser, "Truth and Fallacy Concerning the Roentgen Ray in Hypertrichosis," *Scientific Therapy and Practical Research* (March 1926), reprint in folder 0317-17, AMA.

32. Young (n. 18 above), 217; Niemoeller (n. 11 above), 91.

33. Geyser, "Truth and Fallacy."

34. On Koremlu's toxicity, see *Journal of the American Medical Association* (30 July 1932): 407; A. J. Cramp, *Nostrums and Quackery and Pseudo-Medicine* (Chicago, 1936), 3: 35; and Gwen Kay, "Regulating Beauty: The Role of the Food and Drug Administration in the 1938 Food, Drug, and Cosmetics Act" (paper presented at the annual meeting of the History of Science Society, Atlanta, Ga., November 1996).

35. Cited by Niemoeller, 48.

36. Ernst Ludwig Franz Kroymayer, *The Cosmetic Treatment of Skin Complaints* (London, 1930), 69; McEwen (n. 27 above), 832.

37. As technical refinements were made to electrolysis equipment, the procedure was also practiced at home. See Niemoeller, chap. 21.

38. Adolph Brand, "Hypertrichosis," *New York Medical Journal* 97 (1913): 708.

39. Brocq (n. 14 above).

40. Ibid.; Young (n. 18 above), 219.

41. While historians typically resist explaining technological diffusion according to reified notions of "utility" (the idea that certain technologies succeed simply because they "work" better than others), the efficacy of X-ray hair removal was acknowledged by nearly all commentators in the early twentieth century. For a compelling critique of the notion of technological utility, see Michael Mulkay, "Knowledge and Utility: Implications for the Sociology of Knowledge," *Social Studies of Science* 9 (1979): 63–80.

42. AMA to Mrs. P. G. Range, 28 October 1927, folder 0314-03, AMA; AMA to Mr. A. E. Backman, 29 May 1930, folder 0314-03, AMA.

43. Mary Mulholland to AMA, 20 May 1930, folder 0318-02, AMA. This description of the Tricho machine may remind some readers of the shoe-fitting fluoroscopes employed in North American and European shoe stores in the mid-twentieth century. See "Shoe-Fitting Fluoroscopes," *Journal of the American Medical Association* 139 (9 April 1949): 1004–5; H. Kopp, "Radiation Damage Caused By Shoe-Fitting Fluoroscope," *British Medical Journal* 2 (1957): 1344–45.

44. Geyser, "Facts and Fallacies" (n. 28 above).

45. "Gone for Good," advertisement for Rudolph Tricho Institute, Detroit, folder 0318-01, AMA.

46. See, for example, "Tricho Method of Removing Superfluous Hair," advertisement for Mrs. L. P. Williams's Tricho salons, Connecticut and Massachusetts, folder 0318-01, AMA.

47. "Loveliness for the Most Discriminating Women" (n. 28 above).

48. "A Flawless Skin," *Boston Post*, 15 November 1928, copy in folder 0318-02, AMA.

49. "Gone for Good."

50. Banner (n. 13 above), 205.

51. Roentgen's discovery has been mythicized by Otto Glasser in his *Wilhelm Conrad Röntgen and the Early History of Röntgen Rays* (Springfield, Ill., 1934) and *W. C. Röntgen* (Springfield, Ill., 2nd ed., 1958). On the immediate public response to Roentgen's announcement, see Nancy Knight, "The New Light: X-Rays and Medical Futurism," in *Imagining Tomorrow: History, Technology, and the American Future*, ed. Joseph J. Corn (Cambridge, Mass., 1986); Ronald L. Eisenberg, *Radiology: An Illustrated History* (St. Louis, 1992); E. R. N. Grigg, *The Trail of the Invisible Light* (Springfield, Ill., 1965); Ruth Brecher and Edward

Brecher, *The Rays: A History of Radiology in the United States and Canada* (Baltimore, 1969). Curiously, most of these histories focus on the imaging and diagnostic capabilities of the X ray, to the neglect of the technology's myriad therapeutic applications.

52. John Daniel, "The X-rays," *Science,* 10 April 1896, 562–63.

53. Brecher and Brecher, *The Rays,* 82.

54. Eduard Schiff and Leopold Freund, "Beiträge zur Radiotherapie," *Weiner Medicinische Wochenschrift* 48 (28 May 1898): 1058–61.

55. Neville Wood, "Depilation by Roentgen Rays," *Lancet* 1 (27 January 1900): 231; T. Sjögren and E. Sederholm, "Beitrag zur therapeutischen Verwertung der Röntgenstrahlen," Fortschritte auf dem Gebiete der Röntgenstrahlen 4 (1901): 145–70; Edith R. Meek, "A Variety of Skin Lesions Treated by X-ray," *Boston Medical and Surgical Journal* 147 (7 August 1902): 152–53.

56. Mihran Krikor Kassabian, *Röntgen Rays and Electro-therapeutics* (Philadelphia, 1910), 80.

57. V.E.A. Pullin and W. J. Wiltshire, *X-Rays Past and Present* (London, 1927), 173–74.

58. A review of early awareness of X-ray sequelae may be found in Brecher and Brecher, *The Rays,* (n. 51 above), chap. 7.

59. See, for example, the long, autobiographical description of the grisly results of prolonged X-ray exposure in S. J. R., "Some Effects of the X-rays on the Hands," *Nature,* 29 October 1896, 621, or Elihu Thomson's early descriptions of his famous self-experiments with X-ray exposure: "Roentgen Rays Act Strongly on the Tissues," *Electrical Engineer* 22 (25 November 1896): 534, and "Roentgen Ray Burns," *Electrical Engineer* 23 (14 April 1897): 400.

60. For a general overview of the professionalization of medicine, see Paul Starr, *The Social Transformation of American Medicine* (New York, 1982). On the role of the X ray in professionalization in particular, see Joel Howell, *Technology in the Hospital* (Baltimore, 1995); Stanley Joel Reiser, *Medicine and the Reign of Technology* (Cambridge, 1978); and Bettyann Holtzmann Kevles, *Naked to the Bone: Medical Imaging in the Twentieth Century* (New Brunswick, N.J., 1997). Lisa Cartwright rightly critiques historians' repeated depiction of the X ray as the defining tool of modern professional medicine; see her *Screening the Body: Tracing Medicine's Visual Culture* (Minneapolis, 1995), esp. chap. 5.

61. George M. MacKee, "Hypertrichosis and the X-ray," *Journal of Cutaneous Diseases Including Syphilis* 35 (1917): 177.

62. Carl Beck, *Röntgen Ray Diagnosis and Therapy* (New York, 1904), 377.

63. William Allen Pusey and Eugene Wilson Caldwell, *Röntgen Rays in Therapeutics and Diagnosis* (Philadelphia, 1904), 360–61. For a relevant study of physicians' exclusion of "cosmetic" practices and practitioners during this era of medical professionalization, see Beth Haiken's award-winning work on the controversy surrounding the tension between "reconstructive" (hence medically legitimate) and "cosmetic" (hence illegitimate) plastic surgery in American medicine in the first two decades of the twentieth century: "Plastic Surgery and American Beauty at 1921," *Bulletin of the History of Medicine* 68 (1994): 429–53.

64. Although most professional physicians had disavowed X-ray epilation by 1918, it is important to note that this rejection was neither uniform nor total. As late as 1927 two physicians in Chicago offered an epilating dose of X rays to a girl with a hairy chin and upper lip; see Mrs. P. G. Range to A. J. Cramp, 23 October 1927, folder 0314-03, AMA. Three years later, physician H. H. Hazen reported other colleagues still practicing X-ray epilation; see H. H. Hazen, "Injuries Resulting in Irradiation in Beauty Shops," *American Journal of Roentgenology and Radium Therapy* 23 (1930): 411. Some evidence hints at the medical use of cosmetic X-ray epilation as late as 1960. See Howard T. Behrman, "Diagnosis and Management of Hirsutism," *Journal of the American Medical Association* 172 (23 April 1960): 126.

65. See, e.g., "With the Advancement of Science" (n. 28 above).

66. "Permanent Freedom from Unwanted Hair," advertisement for the Virginia Laboratories, Baltimore, folder 0317-01, AMA. Baltimore's Virginia Laboratories employed the "Marton Method" and used Marton's text and illustrations in many of their advertisements.

67. On the "strange powers" of the ray, see "Gone for Good" (n. 45 above).

68. Ibid.

69. "Be Your True Self: We will tell you how," advertisement for Frances A. Post, Inc., Cleveland, folder 0317-01, AMA.

70. H. Gellert [Secretary of Hamomar Institute] to "Madam," 1933, folder 0317-01, AMA.

71. Ibid.

72. Miss H. Stearn to National Institute of Health, 5 July 1933, folder 0317-01, AMA; "BEAUTY: Woman's Most Precious Gift," advertisement for the Dermic Laboratories, San Francisco and Los Angeles, folder 0317-02, AMA.

73. M. J. Rush, "Hypertrichosis: The Marton Method, A Triumph of Chemistry," *Medical Practice* (March 1924): 956, reprint in folder 0317-01, AMA.

74. "Beauty is your Heritage" (n. 28 above).

75. "Permanent Freedom from Unwanted Hair" (n. 66 above).

76. Herman Goodman, "Correspondence," *Journal of the American Medical Association* 84 (9 May 1925) 1443; S. Dana Hubbard [City of New York Department of Public Health.] to A. J. Cramp, 8 January 1929, folder 0318-02, AMA; Dale Brown [Cleveland Better Business Bureau.] to A. J. Cramp, 29 July 1930, folder 0314-03; AMA. Of course, even if epilation salons recorded statistics on their clients' racial and ethnic backgrounds, these classifications would not necessarily coincide with clients' self-identifications, nor with contemporary racial and ethnic typologies; "race" is hardly stable.

77. Edward Oliver, "Dermatitis Due to 'Tricho Method,'" Archives of Dermatology and Syphilology 25 (1932): 948; D. E. H. Cleveland, "The Removal of Superfluous Hair by X-Rays," *Canadian Medical Association Journal* 59 (1948): 375.

78. B. O. Halling, internal memorandum, 22 October 1925, folder 0318-01, AMA; Mulholland to AMA, 20 May 1930, AMA; Mrs. B. Tellef to AMA, 6 August 1926, folder 0318-01, AMA. Many women received more than forty treatments; one young woman received fourteen hundred exposures over five years; see Dorothy R. Kirk to Arthur Cramp, 14 December 1928, folder 0315-14, AMA.

79. Historians have scrutinized early-twentieth-century eugenic discourses at length. My understanding of this period is most influenced by Donna Haraway's "Teddy Bear Patri-

archy: Taxidermy in the Garden of Eden, New York City, 1908–1936," in *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York, 1989), 26–58.

80. Mary F. Amerise to AMA, 18 May 1925, folder 0314-03, AMA.

81. Anne Steiman to AMA, 5 September 1933, folder 0317-01, AMA (text appears as in original document).

82. "A Flawless Skin" (n. 48 above).

83. Katherine Moore to AMA, 27 August 1931, folder 0318-02, AMA.

84. While one would err by suggesting that the Holocaust marked the end of eugenic thinking, the specter of the Nazi program did (and still does) trouble discussions of racial purity in the United States and Canada. See Robert Proctor's discussion of changes in postwar eugenic discourse in *Racial Hygiene: Medicine under the Nazis* (Cambridge, Mass., 1989), 303–8.

85. As Anja Hiddinga has noted, widespread public discussion of radiation hazards began only after 1945. See Hiddinga, "X-ray Technology in Obstetrics: Measuring Pelves at the Yale School of Medicine," in *Medical Innovations in Historical Perspective*, ed. John Pickstone (London, 1992), 143. For an extended discussion on the significance of Hiroshima, see M. Susan Lindee, *Suffering Made Real: American Science and the Survivors at Hiroshima* (Chicago, 1994). For thorough discussions of the history of radiation standards in the United States, see Daniel Paul Serwer, "The Rise of Radiation Protection: Science, Medicine and Technology in Society, 1896–1935" (Ph.D. diss., Princeton University, 1976), and Gilbert F. Whittemore, "The National Committee on Radiation Protection, 1928–1960: From Professional Guidelines to Government Regulation" (Ph.D. diss., Harvard University, 1986).

86. On the revision of licensing laws, see C. B. Pinkham to Max C. Starkhoff, 3 April 1928, folder 0318-02, AMA; C. B. Pinkham to A. J. Cramp, 22 January 1929, folder 0318-02, AMA. On the distribution of X-ray equipment, see A. J. Cramp to Howard Fox, 15 November 1929, folder 0318-02, AMA; Rollins H. Stevens to Arthur Cramp, 8 November 1929, folder 0318-02, AMA.

87. Better Business Bureau of Rochester to A. J. Cramp, 15 May 1930, folder 0318-02, AMA; Howard Fox to Arthur J. Cramp, 13 November 1929, folder 0318-02, AMA.

88. The disintegration of the Tricho Sales Corporation in 1930, for example, was influenced by a collective lawsuit organized by a group of seven New York women, all former clients. See S. Dana Hubbard [New York City Department of Health] to A. J. Cramp, 8 January 1929, folder 0318-02, AMA. See also S. Dana Hubbard to C. B. Pinkham, 8 January 1929, folder 0318-02, AMA.

89. New franchises that publicly advertised the technique were opening in Canada as late as 1948. See Cleveland (n. 77 above), 374. It is impossible to determine the extent of back-alley X-ray epilation.

90. Ruth Schwartz Cowan, "The Industrial Revolution in the Home: Household Technology and Social Change in the 20th Century," *Technology and Culture* 17 (1976): 1. Conversations with Robert D. Friedel have encouraged me to uncover the histories of unglamorous, everyday technologies.

91. See, e.g., Valerie Smith, "Reading the Intersection of Race and Gender in Narratives

of Passing," *diacritics* 24 (Summer/Fall 1994): 43; Judith Butler, "Passing, Queering: Nella Larsen's Psychoanalytic Challenge," *Bodies That Matter* (New York, 1993), 167–85; Werner Sollers, *Neither Black nor White Yet Both* (New York, 1997). Also see Nella Larson, *Passing* (New York, reprint, 1969), and George S. Schuyler, *Black No More: Being an Account of the Strange and Wonderful Workings of Science in the Land of the Free, A.D. 1933–1940* (New York, reprint, 1971).

92. For one recent exception to this trend, see Tanya Hart, "From 'Heated Forks' to Pressing Combs: African American Women, Technology, and Progressive-Era Beauty Culture" (paper presented at the annual meeting of the Society for the History of Technology, Baltimore, Maryland, October 1998).

93. See, for example, in William J. Hammer Collection, 1874–1935, Archives Center, National Museum of American History, Washington D.C., "All Coons to Look White: College Professors Have Scheme to Solve Race Problem" (*New York City Morning Telegraph*, 22 January 1904), clipping in box 59, folder 2; "Radium and X-Ray Used to Beautify," *Boston Herald*, 8 May 1904, clipping in box 59, folder 3; "'Can the Ethiopian Change His Skin or the Leopard His Spots': Radium Light Turns Negro's Skin White," *Boston Globe*, 25 January 1904, box 60, folder 2; "Burning Out Birthmarks, Blemishes of the Skin and Even Turning a Negro White with the Magic Rays of Radium, the New Mystery of Science!" *New York American*, 10 January 1904, box 60, folder 2.

94. Helen L. Camp to AMA, 30 March 1954, folder 0318-02, AMA (text appears as in original document).