

Socially Camouflaged Technologies: The Case of the Electromechanical Vibrator

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Abstract — The electromechanical vibrator emerged in the 1880s as a medical instrument designed to mechanize massage techniques employed by physicians since antiquity. Among these was vulvular massage to orgasm as a treatment for hysteria in women. The sexual character of the therapy was camouflaged in medical rhetoric which characterized female arousal as a pathological syndrome from which relief was obtained in the “hysterical paroxysm.” Manual massage was fatiguing and slow, however, and water and steam-powered methods capital-intensive; when portable vibrators powered by line electricity became available at the turn of this century they quickly became the dominant medical massage technology until the appearance of vibrators in erotic films in the 1920s eroded the instrument’s social camouflage.

Certain commodities are sold in the legal marketplace for which the expected use is either illegal or socially unacceptable. Marketing of these goods, therefore, requires camouflaging of the design purpose in a verbal and visual rhetoric that conveys to the knowledgeable consumer the item’s selling points without actually endorsing its socially prohibited uses. I refer not to goods that are actually illegal in character, such as marijuana, but to their grey-market background technologies, such as cigarette rolling papers. Marketing efforts for goods of this type have similar characteristics over time, despite the dissimilarity of the advertised commodities. I shall discuss here an electromechanical technology that addresses formerly prohibited expressions of women’s sexuality—the vibrator in its earliest incarnation between 1870 and 1930. Comparisons will be drawn between marketing strategies for this electromechanical technology, introduced between 1880 and 1903, and that of emmenagogues, distilling, burglary tools, and computer software copying, as well as the paradigm example of drug paraphernalia.

I shall argue here that electromechanical massage of the female genitalia achieved acceptance during the period in question by both professionals and consumers not only because it was less cumbersome, labor-intensive and costly than predecessor technologies, but because it maintained the social camouflage of sexual massage treatment through its associations with modern professional instrumentation and with prevailing beliefs about electricity as a healing agent.[1]

The case of the electromechanical vibrator, as a technology associated with women’s sexuality, involves issues of acceptability rather than legality. The vibrator and its predecessor technologies, including the dildo, are associated with masturbation, a socially prohibited activity until well into the second half of this century.[2] Devices for mechanically-assisted female masturbation, mainly vibrators and dildoes, were marketed in the popular press from the late nineteenth century through the early thirties in similarly camouflaged advertising. Such advertisements temporarily disappeared from popular literature after the vibrator began to appear in stag films, which may have rendered the camouflage inadequate, and did not resurface until

social change made it unnecessary to disguise the sexual uses of the device.[3]

For purposes of this discussion, a vibrator is a mechanical or electromechanical appliance imparting rapid and rhythmic pressure through a contoured working surface usually mounted at a right angle to the handle. These points of contact generally take the form of a set of interchangeable vibratodes configured to the anatomical areas they are intended to address. Vibrators are rarely employed internally in masturbation; they thus differ from dildoes, which are generally straight-shafted and may or may not include a vibratory component. Vibrators are here distinguished also from massagers, the working surfaces of which are flat or dished.[4] It should be noted that this is a historian’s distinction imposed on the primary sources; medical authors and appliance manufacturers apply a heterogeneous nomenclature to massage technologies. Vibrators and dildoes rarely appeared in household advertising between 1930 and 1955, massagers continued to be marketed, mainly through household magazines.[5]

The electromechanical vibrator, introduced as a medical instrument in the 1880s and as a home appliance between 1900 and 1903, represented the convergence of several older medical massage technologies, including manual, hydriatic, electrotherapeutic and mechanical methods. Internal and external gynecological massage with lubricated fingers had been a standard medical treatment for hysteria, disorders of menstruation and other female complaints at least since the time of Aretaeus Cappadox (circa 150 A.D.), and the evidence suggests that orgasmic response on the part of the patient may have been the intended therapeutic result.[6] Douche therapy, a method of directing a jet of pumped water at the pelvic area and vulva, was employed for similar purposes after hydrotherapy became popular in the eighteenth and nineteenth centuries.[7] The camouflage of the apparently sexual character of such therapy was accomplished through its medical respectability and through creative definitions both of the diseases for which massage was indicated and of the effects of treatment. In the case of the electromechanical vibrator, the use of electrical power contributed the cachet of modernity and linked the instrument to older technologies of electrotherapeutics, in which patients received low-voltage electricity through electrodes attached directly to the skin or mucous membranes, and to light-bath therapy, in which electric light was applied to the

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skin in a closed cabinet. The electrotherapeutic association was explicitly invoked in the original term for the vibrator's interchangeable applicators, which were known as "vibratodes." Electrical treatments were employed in hysteria as soon as they were introduced in the eighteenth century, and remained in use as late as the 1920s.

Hysteria as a disease paradigm, from its origins in the Egyptian medical corpus through its conceptual eradication by American Psychological Association fiat in 1952, was so vaguely and subjectively defined that it might encompass almost any set of ambiguous symptoms that troubled a woman or her family. As its name suggests, hysteria as well as its "sister" complaint chlorosis were until the twentieth century thought to have their etiology in the female reproductive tract generally, and more particularly in the organism's response to sexual deprivation.[8] This physiological condition seems to have achieved epidemic proportions among women and girls, at least in the modern period.[9] Sydenham, writing in the seventeenth century, observed that hysteria was the most common of all diseases except fevers.[10]

In the late nineteenth century, physicians noted with alarm that from half to three-quarters of all women showed signs of hysterical affliction. Among the many symptoms listed in medical descriptions of the syndrome are anxiety, sense of heaviness in the pelvis, edema (swelling) in the lower abdomen and genital areas, wandering of attention and associated tendencies to indulge in sexual fantasy, insomnia, irritability, and "excessive" vaginal lubrication.[11]

The therapeutic objective in such cases was to produce a "crisis" of the disease in the Hippocratic sense of this expression, corresponding to the point in infectious diseases at which the fever breaks. Manual massage of the vulva by physicians or midwives, with fragrant oils as lubricants, formed part of the standard treatment repertoire for hysteria, chlorosis and related disorders from ancient times until the post-Freudian era. The crisis induced by this procedure was usually called the "hysterical paroxysm." Treatment for hysteria might comprise up to three-quarters of a physician's practice in the nineteenth century. Doctors who employed vulvular massage treatment in hysteria thus required fast, efficient and effective means of producing the desired crisis. Portability of the technology was also a desideratum, as physicians treated many patients in their homes, and only manual massage under these conditions was possible until the introduction of the portable battery-powered vibrator for medical use in the late 1880s.

Patients reported experiencing symptomatic relief after such treatments, and such conditions as pelvic congestion and insomnia were noticeably ameliorated, especially if therapy continued on a regular basis. A few physicians, including Nathaniel Highmore in the seventeenth century and Auguste Tripiet, a nineteenth century electrotherapist, clearly recognized the hysterical paroxysm as sexual orgasm.[12] That many of their colleagues also perceived the sexual character of hysteria treatments is suggested by the fact that, in the case of married women, one of the therapeutic options was intercourse, and in the case of single women, marriage was routinely recommended.[13] "God-fearing physicians," as Zacuto expressed it in the seventeenth century, were expected to induce the paroxysm with their own fingers only when absolutely necessary, as in the case of very young single women, widows and nuns.[14]

Many later physicians, however, such as the nineteenth century hydrotherapist John Harvey Kellogg, seem not to have perceived the sexual character of patient response. Kellogg

wrote extensively about hydrotherapy and electrotherapeutics in gynecology. In his "Electrotherapeutics in Chronic Maladies," published in *Modern Medicine* in 1904, he describes "strong contractions of the abdominal muscles" in a female patient undergoing treatment, and similar reactions such that "the office table was made to tremble quite violently with the movement." [15] In their analysis of the situation, these physicians may have been handicapped by their failure to recognize that penetration is a successful means of producing orgasm in only a minority of women; thus treatments that did not involve significant vaginal penetration were not morally suspect. In effect, misperceptions of female sexuality formed part of the camouflage of the original manual technique that preceded the electromechanical vibrator. Insertion of the speculum, however, since it travelled the same path as the supposedly irresistible penis during intercourse, was widely criticized in the medical community for its purportedly immoral effect on patients.[16] That some questioned the ethics of the vulvular massage procedure is clear; Thomas Stretch Dowse quotes Graham as observing that "Massage of the pelvic organs should be intrusted to those alone who have 'clean hands and a pure heart'." [17] One physician, however, in an article significantly titled "Signs of Masturbation in the Female," proposed the application of an electrical charge to the clitoris as a test of salacious propensities in women. Sensitivity of the organ to this type of electrical stimulation, in his view, indicated secret indulgence in what was known in the nineteenth century as "a bad habit." [18] Ironically, such women were often treated electrically for hysteria supposedly caused by masturbation.

However they construed the benefits, physicians regarded the genital massage procedure, which could take as long as an hour of skilled therapeutic activity, as something of a chore, and made early attempts to mechanize it. Hydrotherapy, in the form of what was known as the "pelvic douche" (massage of the lower pelvis with a jet of pumped water), provided similar relief to the patient with reduced demands on the therapist. Doctors of the eighteenth and nineteenth centuries frequently recommended douche therapy for their women patients who could afford spa visits. This market was limited, however, as both treatment and travel were costly.[19] A very small minority of patients and doctors could afford to install hydrotherapeutic facilities in convenient locations; both doctor and patient usually had to travel to the spa. Electrically-powered equipment, when it became available, thus had a decentralizing and cost-reducing effect on massage treatment.

In the 1860s, some spas and clinics introduced a coal-fired steam powered device invented by a Dr. George Taylor, called the "Manipulator," which massaged the lower pelvis while the patient either stood or lay on a table.[20] This too required a considerable expenditure either by the physician who purchased the equipment or by the patient who was required to travel to a spa for treatment. Thus, when the electromechanical vibrator was invented two decades later in England by Mortimer Granville and manufactured by Weiss, a ready market already existed in the medical community.[21] Ironically, Mortimer Granville considered the use of his instrument on women, especially hysterics, a morally indefensible act, and recommended the device only for use on the male skeletal muscles.[22] Although his original battery-powered model was heavy and unreliable, it was more portable than water-powered massage and less fatiguing to the operator than manual massage (Fig. 1).

Air-pressure models were introduced, but they required cumbersome tanks of compressed air, which needed frequent

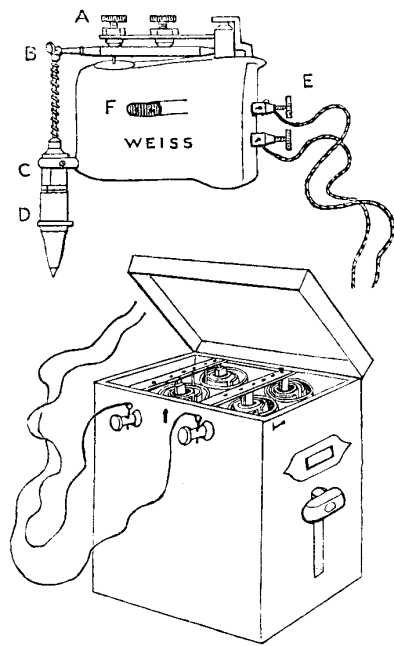


Fig. 1. Joseph Mortimer Granville's "percuteur" of 1883, manufactured by the Weiss Instrument Company.

refilling. When line electricity became widely available, portable plug-in models made vibratory house calls more expeditious and cost effective for the enterprising physician. The difficulty of maintaining batteries in or out of the office was noted by several medical writers of the period predating the introduction of plug-in vibrators.[23] Batteries and small office generators were liable to fail at crucial moments during patient treatment, and required more engineering expertise for their maintenance than most physicians cared to acquire. Portable models using dc or ac line electricity were available with a wide range of vibratodes, such as the twelve-inch rectal probe supplied with one of the Gorman firm's vibrators.

Despite its inventor's reservations, the Weiss instrument and later devices on the same principle were widely used by physicians for pelvic disorders in women and girls. The social camouflage applied to the older manual technology was carefully maintained in connection with the new, at least until the 1920s. The marketing of medical vibrators to physicians and the discussion of them in such works as Covey's *Profitable Office Specialties* addressed two important professional considerations: the respectability of the devices as medical instruments (including their reassuringly clinical appearance) and their utility in the fast and efficient treatment of those chronic disorders, such as pelvic complaints in women, that provided a significant portion of a physician's income.[24] The importance of a prestige image for electromechanical instrumentation, and its role in the pricing of medical vibrators is illustrated by a paragraph in the advertising brochure for the "Chattanooga," (Figs. 2 and 3), at \$200 in 1904 the most costly of the physicians' office models:

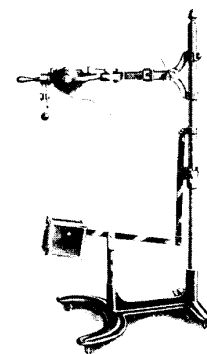
The Physician can give with the "Chattanooga" Vibrator a thorough massage treatment in three minutes that is extremely pleasant and beneficial, but this instrument is

neither designed nor sold as a "Massage Machine." It is sold only to Physicians, and constructed for the express purpose of exciting the various organs of the body into activity through their central nervous supply. [25]

I do not mean to suggest that gynecological treatments were the only uses of such devices, or that all physicians who purchased them used them for the production of orgasm in female patients, but the literature suggests that a substantial number were interested in the new technology's utility in the hysteroneurasthenic complaints. The interposition of an official-looking machine must have done much to restore clinical dignity to the massage procedure. The vibrator was introduced in 1899 as a home medical appliance, and was by 1904 advertised in household magazines in suggestive terms we shall examine later on. It was important for physicians to be able to justify to patients the expense of \$2-3 per treatment, as home vibrators were available for about \$5.

The acceptance of the electromechanical vibrator by physicians at the turn of this century may also have been influenced by their earlier adoption of electrotherapeutics, with which vibratory treatment could be, and often was, combined.[26] Vibratory therapeutics were introduced from London and Paris, especially from the famous Hôpital Salpêtrière, which added to their respectability in the medical community.[27] It is worth noting as well that in this period electrical and other vibrations were a subject of great interest and considerable confusion, not only among doctors and the general public, but even among scientists like Tesla, who is reported to have fallen under their spell. "... [T]he Earth," he wrote, "is responsive to electrical vibrations of definite pitch just as a tuning fork to certain waves of sound. These particular electrical vibrations, capable of powerfully exciting the Globe, lend themselves to innumerable uses of great importance ..."[28] In the same

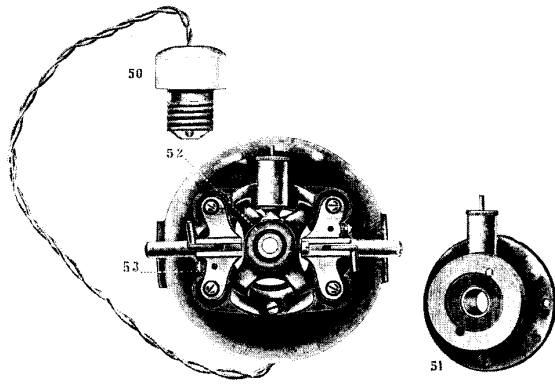
The Chattanooga Vibrator



*Vibrator Instrument Company
Chattanooga, Tennessee*

CHICAGO, ILLINOIS
NEW YORK CITY

Fig. 2. The Chattanooga, at \$200 the most expensive medical vibrator available in 1904, could be wheeled over the operating table and its vibrating head rotated for the physician's convenience.



External Parts of Motor

- 50. Plug.
- 51. Cap, for front end of Motor, Oxidized Copper Finish.
- 52. Brass Bearing.
- 53. Brush Holder, Nickel Finish.

Fig. 3. Chattanooga Vibrator parts.

category of mystical reverence for vibration is Samuel Wallian's contemporaneous essay on "The Undulatory Theory in Therapeutics," in which he describes "modalities or manifestations of vibratory impulse" as the guiding principle of the universe. "Each change and gradation is not a transformation, as mollusk into mammal, or monkey into man, but an evidence of a variation in vibratory velocity. A certain rate begets a *vermis*, another and higher rate produces a *viper*, a *vertebrate*, a *vestryman*." [29]

In 1900, according to Monell, more than a dozen medical vibratory devices for physicians had been available for examination at the Paris Exposition. Of these, few were able to compete in the long term with electromechanical models. Mary L. H. Arnold Snow, writing for a medical readership in 1904, discusses in some depth more than twenty types, of which more than half are electromechanical. These models, some priced to the medical trade as low as \$15, delivered vibrations from one to 7,000 pulses a minute. Some were floor-standing machines on rollers; others could be suspended from the ceiling like the modern impact wrench. [30] The more expensive models were adapted to either ac or dc currents. A few, such as those of the British firm Schall and Son, could even be ordered with motors custom-wound to a physician's specifications. Portable and battery-powered electromechanical vibrators were generally less expensive than floor models, which both looked more imposing as instruments and were less likely to transmit fatiguing vibrations to the doctor's hands.

Patients were treated in health spa complexes, in doctor's offices or their own homes with portable equipment. Designs consonant with prevailing notions of what a medical instrument should look like inspired consumer confidence in the physician and his apparatus, justified treatment costs, and, in the case of hysteria treatments, camouflaged the sexual character of the therapy. Hand or foot-powered models, however, were tiring to the operator; water-powered ones became too expensive to operate when municipalities began metering water in the early twentieth century. Gasoline engines and batteries were cumbersome and difficult to maintain, as noted above. No fuel

or air-tank handling by the user was required for line electricity, in contrast with compressed air, steam and petroleum as power sources. In the years after 1900, as line electricity became the norm in urban communities, the electromechanical vibrator emerged as the dominant technology for medical massage.

Some physicians contributed to this trend by endorsing the vibrator in works like that of Monell, who had studied vibratory massage in medical practice in the United States and Europe at the turn of this century. He praises its usefulness in female complaints:

... pelvic massage (in gynecology) has its brilliant advocates and they report wonderful results, but when practitioners must supply the skilled technic with their own fingers the method has no value to the majority. But special applicators (motor-driven) give practical value and office convenience to what otherwise is impractical. [31]

Other medical writers suggested combining vibratory treatment of the pelvis with hydro- and electrotherapy, a refinement made possible by the ready adaptability of the new electro-mechanical technology.

At the same period, mechanical and electromechanical vibrators were introduced as home medical appliances. One of the earliest was the Vibratile, a battery-operated massage device advertised in 1899. Like the vibrators sold to doctors, home appliances could be handpowered, water-driven, battery or street-current apparatus in a relatively wide range of prices from \$1.50 to \$28.75. This last named was the price of a Sears, Roebuck model of 1918, which could be purchased as an attachment for a separate electrical motor, drawing current through a lamp socket, which also powered a fan, buffer, grinder, mixer and sewing machine. The complete set was marketed in the catalogue under the headline "Aids that Every Woman Appreciates." (Fig. 4). Vibrators were mainly marketed to women, although men were sometimes exhorted to purchase the devices as gifts for their wives, or to become door-to-door sales representatives for the manufacturer. [32]

The electromechanical vibrator was preceded in the home market by a variety of electrotherapeutic appliances which continued to be advertised through the twenties, often in the same publications as vibratory massage devices. Montgomery Ward, Sears Roebuck and the Canadian mail order department store T. Eaton and Company all sold medical batteries by direct-mail by the end of the nineteenth century. These were simply batteries with electrodes that administered a mild shock. Some, like Butler's Electro-Massage Machine, produced their own electricity with friction motors. Contemporaneous and later appliances sometimes had special features, such as Dr. H. Sanche's Oxydonor, which produced ozone in addition to the current when one electrode was placed in water. "Electric" massage rollers, combs and brushes with a supposedly permanent charge retailed at this time for prices between one and five dollars. Publications like the *Home Needlework Magazine* and *Men and Women* advertised these devices, as well as related technologies, including correspondence courses in manual massage.

Vibrators with water motors, a popular power source, as noted above, before the introduction of metered water, were advertised in such journals as *Modern Women*, which emphasized the cost savings over treatments by physicians and further emphasized the advantage of privacy offered by home treatment. Such devices were marketed through the teens in *Hearst's* and its successors, and in *Woman's Home Compa-*

nion.[33] Electromechanical vibrators were sold in the upper middle class market, in magazines typically retailing for between ten and fifteen cents an issue. As in the case of medical vibrators, models adapted to both ac and dc current were more expensive than those for use with dc only; all were fitted with screw-in plugs through the twenties.[34]

All types of vibrators were advertised as benefiting health and beauty by stimulating the circulation and soothing the nerves. The makers of the electromechanical American vibrator, for example, recommended their product as an "... alleviating, curative and beautifying agent ... It will increase deficient circulation—develop the muscles—remove wrinkles and facial blemishes, and beautify the complexion." [35] Advertisements directed to male purchasers similarly emphasized the machine's advantages for improving a woman's appearance and disposition. And ad in a 1921 issue of *Hearst's* urges the considerate husband to "Give 'her' a Star for Christmas" on the grounds that it would be "A Gift That Will Keep Her Young and Pretty." The same device was listed in another advertisement with several other electrical appliances, and labelled "Such Delightful Companions!" [36] A husband, these advertisements seem to suggest, who presented his wife with these progressive and apparently respectable medical aids might leave for work in the morning secure in the knowledge that his spouse's day would be pleasantly and productively invested in self-treatment. Like other electrical appliance advertising of the time, electromechanical vibrator ads emphasized the role of the device in making a woman's home a veritable Utopia of modern technology, and its utility in reducing the number of occasions, such as visiting her physician, on which she would be required to leave her domestic paradise.[37]

Advertisements for vibrators often shared magazine pages with books on sexual matters, such as Howard's popular *Sex Problems in Worry and Work* and Walling's *Sexology*, hand-guns, cures for alcoholism and, occasionally, even personals, from both men and women, in which matrimony was the declared objective. Sexuality is never explicit in vibrator advertising; the tone is vague but provocative, as in the Swedish Vibrator advertisement in *Modern Priscilla* of 1913, offering "a machine that gives 30,000 thrilling, invigorating, penetrating, revitalizing vibrations per minute ... Irresistible desire to own it, once you feel the living pulsing touch of its rhythmic vibratory motion." Illustrations in these layouts typically include voluptuously proportioned women in various states of *déshabillé*. The White Cross vibrator, made by a Chicago firm that manufactured a variety of small electrical appliances, was also advertised in *Modern Priscilla*, where the maker assured readers that "It makes you fairly tingle with the joy of living." [38] It is worth noting that the name "White Cross" was drawn from that of an international organization devoted to what was known in the early twentieth century as "social hygiene," the discovery and eradication of masturbation and prostitution wherever they appeared. The Chicago maker of White Cross appliances, in no known way affiliated with the organization, evidently hoped to trade on the name's association with decency and moral purity. [39] A 1916 advertisement from the White Cross manufacturer in *American Magazine* nevertheless makes the closest approach to explicit sexual claims when it promises that "All the keen relish, the pleasures of youth, will throb within you." [40] The utility of the product for female masturbation was thus consistently camouflaged.

Electromechanical vibrator advertising almost never appeared in magazines selling for less than 5 cents an issue (10 to 20 cents

is the median range) or more than 25 cents. Readers of the former were unlikely to have access to electrical current; readers of the latter, including, for example, *Vanity Fair*, were more likely to respond to advertising for spas and private manual massage. While at least a dozen and probably more than twenty U.S. firms manufactured electromechanical vibrators before 1930, sales of these appliances were not reported in the electrical trade press. A listing from the February 1927 *NELA Bulletin* is typical; no massage equipment of any kind appears on an otherwise comprehensive list that includes violet-ray appliances. [41] A 1925 article in *Electrical World*, under the title "How Many Appliances are in Use?", lists only irons, washing machines, cleaners, ranges, water heaters, percolators, toasters, waffle irons, kitchen units and ironers. [42] *Scientific American* listed in 1907 only the corn popper, chafing dish, milk warmer, shaving cup, percolator and iron in a list of domestic electrical appliances. [43] References to vibrators were extremely rare even in popular discussions of electrical appliances. [44] The U.S. Bureau of the Census, which found 66 establishments manufacturing electro-therapeutic apparatus in 1908, does not disaggregate by instrument type either in this category or in "electrical household goods." The 1919 volume, showing the electro-medical market at a figure well over \$2 million, also omits detailed itemization. Vibrators appear by name in the 1949 *Census of Manufactures*, but it is unclear whether the listing for them, aggregated with statistics for curling irons and hair dryers, includes those sold as medical instruments to physicians. [45] This dearth of data renders sales tracking of the electromechanical vibrator extremely difficult. The omissions from engineering literature are worth noting, as the electromechanical vibrator was one of the first electrical appliances for personal care, partly because it was seen as a safe method of self-treatment. [46]

The marketing strategy for the early electromechanical vibrator was similar to that employed for contemporaneous and even modern technologies for which social camouflage is considered necessary. Technologically, the devices so marketed differ from modern vibrators sold for explicitly sexual purposes only in their greater overall weight, accounted for by the use of metal housings in the former and plastic in the latter. The basic set of vibratodes is identical, as is the mechanical action. The social context of the machine, however, has undergone profound change. Liberalized attitudes toward masturbation in both sexes and increasing understanding of women's sexuality have made social camouflage superfluous.

In the case of the vibrator, the issue is one of acceptability, but there are many examples of similarly marketed technology of which the expected use was actually illegal. One of these, which shares with the vibrator a focus on women's sexuality, was that of "emmenagogues" or abortifacient drugs sold through the mail and sometimes even off the shelf in the first few decades of this century. Emmenagogues, called in pre-FDA advertising copy "cycle restorers," were intended to bring on the menses in women who were "late." Induced abortion by any means was of course illegal, but late menses are not reliable indicators of pregnancy. Thus, women who purchased and took "cycle restorers" might or might not be in violation of anti-abortion laws; they themselves might not be certain without a medical examination. The advertising of these commodities makes free use of this ambiguity in texts like the following from *Good Stories* of 1933:

Late? End Delay—Worry. American Periodic Relief Compound double strength tablets combine Safety with Quick

Action. Relieve most Stubborn cases. No Pain. New discovery. Easily taken. Solves women's most perplexing problem. RELIEVES WHEN ALL OTHERS FAIL. Don't be discouraged, end worry at once. Send \$1.00 for Standard size package and full directions. Mailed same day, special delivery in plain wrapper. American Periodic Relief Compound Tablets, extra strength for stubborn cases, \$2.00. Generous Size Package. New Book free.[47]

The rhetoric here does not mention the possibility of pregnancy, but the product's selling points would clearly suggest this to the informed consumer through the mentions of safety, absence of pain, and stubborn cases. The readers of the pulp tabloid *Good Stories* clearly did not require an explanation of "women's most perplexing problem."

Distilling technology raises similar issues of legality. During the Prohibition period, the classified section of a 1920 *Ainslee's* sold one and four gallon copper stills by mail, advising the customer that the apparatus was "Ideal for distilling water for drinking purposes, automobile batteries and industrial uses." [48] Modern advertisements for distilling equipment contain similar camouflage rhetoric, directing attention away from the likelihood that most consumers intend to employ the device in the production of beverages considerably stronger than water. [49]

Although changes in sexual mores have liberated the vibrator, social camouflage remains necessary for stills and many other modern commodities, including drug paraphernalia. The Deering Prep Kit, for example, is advertised at nearly \$50 as a superlative device for grinding and preparing fine powders, "such as vitamin pills or spices." [50] Burglary tools are marketed in some popular (if lowbrow) magazines with the admonition that they are to be used only to break into one's own home or automobile, in the event of having locked oneself out. The camouflage rhetoric seems to suggest that all prudent drivers and homeowners carry such tools on their persons at all times. Most recently, we have seen the appearance of computer software for breaking copy protection, advertised in terms that explicitly prohibit its use for piracy, although surely no software publisher is so naive as to believe that all purchasers intend to break copy protection only to make backup copies of legitimately purchased programs and data. [51] As in vibrator advertising, the product's advantages are revealed to knowledgeable consumers in language that disclaims the manufacturers' responsibility for illegal or immoral uses of the product.

The marketing of socially camouflaged technologies is directed to consumers who already understand the design purpose of the product, but whose legally and/or culturally unacceptable intentions in purchasing it cannot be formally recognized by the seller. The marketing rhetoric must extoll the product's advantages for achieving the purchaser's goals—in the case of the vibrator, the production of orgasm—by indirection and innuendo, particularly with reference to the overall results, i.e., relaxation and relief from tension. The same pattern emerges in the advertisement of emmenagogues: according to the manufacturer, it is "Worry and Delay" that are ended, not pregnancy. In the case of software copyright protection programs, drug paraphernalia and distilling equipment, the expected input and/or output are simply misrepresented, so that an expensive finely-calibrated scale with its own fitted carrying case may be pictured in use in the weighing of jelly beans. As social values and legal restrictions shift, the social camouflaging of technologies may be expected to change in

response, or to be dispensed with altogether, as in the case of the vibrator.

REFERENCES

- [1] Various versions of this paper have benefitted from comments and criticism from John Senior at the Bakken, Joel Tarr of Carnegie-Mellon University, Shere Hite of Hite Research, Karen Reeds of Rutgers University Press, my former students at Clark University, and participants in the Social and Economic History Seminar, Queens University (Canada), the Hannah Lecture series in the History of Medicine at the University of Ottawa, and the 1986 annual meeting of the Society for the History of Technology with the Society for the Social Study of Science. Anonymous referees of this and other journals have also provided valuable guidance in structuring the presentation of my research results.
- [2] Sokolow, Jayme A., *Eros and Modernization: Sylvester Graham, Health Reform and the Origins of Victorian Sexuality in America*. Rutherford, NJ: Fairleigh Dickinson University Press, 1983, pp. 77-99; Haller, John S., and Robin Haller, *The Physician and Sexuality in Victorian America*. Urbana: University of Illinois Press, 1973, pp. 184-216; Greydanus, Donald E., "Masturbation; Historic Perspective," *New York State Journal of Medicine*, November 1980, vol. 80, no. 12, pp. 1892-1896; Szasz, Thomas, *The Manufacture of Madness*. New York: Harper and Row, 1977, pp. 180-206; Hare, E. H., "Masturbatory Insanity: The History of an Idea," *Journal of Mental Sciences*, 1962, vol 108, pp. 1-25; and Bullough, Vern, "Technology for the Prevention of 'Les Maladies Produites par la Masturbation,'" *Technology and Culture*, October 1987, vol. 28, no. 4, pp. 828-832.
- [3] On the vibrator in stag films, see Blake, Roger, *Sex Gadgets*. Cleveland: Century, 1968, pp. 33-46. An early postwar reference to the vibrator as an unabashedly sexual instrument is Ellis, Albert, *If this be Sexual Heresy*. New York: Lyle Stuart, 1963, p. 136.
- [4] Vibrators and dildoes are illustrated in Tabori, Paul, *The Humor and Technology of Sex*. New York: Julian Press, 1969; the dildo is discussed in a clinical context in Masters, William H., *Human Sexual Response*. Boston: Little, Brown, 1966. Vibrators of the period to which I refer in this essay are illustrated in Gorman, Sam J., *Electro Therapeutic Apparatus*. 10th ed. Chicago: Sam J. Gorman, c1912; Wappler Electric Manufacturing Co. Inc. *Wappler Cautery and Light Apparatus and Accessories*. 2nd ed. New York: Wappler Electric Manufacturing, 1914, pp. 7 and 42-43; Manhattan Electrical Supply Co., *Catalogue Twenty-Six: Something Electrical for Everybody*. New York: MESCO, n.d.; and Snow, Mary Lydia Hastings Arnold, *Mechanical Vibration and its Therapeutic Application*. New York: Scientific Author's Publication Company, 1904 and 1912. For modern vibrators, see Kaplan, Helen Singer, "The Vibrator: A Misunderstood Machine," *Redbook*, May 1984, p. 34; and Swarz, Mimi, "For the Woman Who Has Almost Everything," *Esquire*, July 1980, pp. 56-63.
- [5] See, for examples of such advertising, which in fact included a persistent abdominal emphasis, "Amazing New Electric Vibrating Massage Pillow," Niresk Industries (Chicago, IL) advertisement in *Workbasket*, October 1958, p. 95; "Don't be Fat," body massager (Spot Reducer) advertisement in *Workbasket*, September 1958, p. 90; and "Uvral Pneumatic Massage Pulsator," in *Electrical Age for Women*, January 1932, vol. 2, no. 7, pp. 275-276.
- [6] This therapy is extensively documented but rarely noted by historians. For only a few examples of medical discussions of vulvular massage in the hysteroneurasthenic disorders, see Aretaeus Cappadox, *The Extant Works of Aretaeus the Cappadocian*, ed. and transl. by Francis Adams. London: Sydenham Society, 1856, pp. 44-45, 285-287, and 449-451; Forestus, Alemarianus Petrus (Pieter van Foreest), *Observationem et Curationem Medicinalium ac Chirurgicarum Opera Omnia*. Rothomagi: Bertherlin, 1653, vol. 3, book 28, pp. 277-340; Galen of Pergamon, *De Locis Affectis*, transl. by Rudolph Siegel. Basel and New York: S. Karger, 1976, book VI, chapter II: 39; and Weber, A. Sigismund, *Traitement par l'Électricité et le Massage*. Paris: Alex Coccoz, 1889, pp. 73-80. Of modern scholars, only Audrey Ec-

- cles discusses this therapy in detail in her *Obstetrics and Gynaecology in Tudor and Stuart England*. London and Canberra: Croom Helm, 1982, pp. 76-83.
- [7] Baruch, Simon, *The Principles and Practice of Hydrotherapy: A Guide to the Application of Water in Disease*. New York: William Wood and Company, 1897, pp. 101, 211, 248 and 365; Dieffenbach, William H., *Hydrotherapy*. New York: Rebman, 1909, pp. 238-245; Good Health Publishing Company, *20th Century Therapeutic Appliances*. Battle Creek, MI: Good Health Publishing, 1909, pp. 20-21; Hedley, William Snowdon, *The Hydro-Electric Methods in Medicine*. London: H. K. Lewis, 1892; Hinsdale, Guy, *Hydrotherapy*. Philadelphia and London: W. B. Saunders Company, 1910, p. 224; Kellogg, John Harvey, *Rational Hydrotherapy*. Philadelphia: Davis, 1901; Irwin, J. A., *Hydrotherapy at Saratoga*. New York: Casell, 1892, pp. 85-134 and 246-248; Pope, Curran, *Practical Hydrotherapy: A Manual for Students and Practitioners*. Cincinnati, OH: Lancet-Clinic Publishing Co., 1909, pp. 181-192 and 506-538; and Trall, Russell Thacher, *The Hydropathic Encyclopedia*. New York: Fowlers and Wells, 1852, pp. 273-295. Women were reportedly in the majority as patients at spas, and some were owned by women entrepreneurs and/or physicians. See Whyman, T., "Visitors to Margate in the 1841 Census Returns," *Local Population Studies*, vol. 8, 1972, p. 23. Since at least the time of Jerome, baths and watering places have had a reputation for encouraging unacceptable expressions of sexuality. For female masturbation with water, see Aphrodite, J. [pseud.], *To Turn You On: 39 Sex Fantasies for Women*. Secaucus, NJ: Lyle Stuart, Inc., 1975, pp. 83-91; and Halpert, E., "On a Particular Form of Masturbation in Women: Masturbation with Water," *Journal of the American Psychoanalytic Association*, 1973, vol. 21, p. 526.
- [8] A bibliography of nineteenth century American works on women and sexuality in relation to hysteria is available in Sahli, Nancy, *Women and Sexuality in America: A Bibliography*. Boston: Hall, 1984. See also Shorter, Edward, "Paralysis: the Rise and Fall of the 'Hysterical' Symptom," *Journal of Social History*, Summer 1986, vol. 19, no. 4, pp. 549-582; Satow, Roberta. "Where Has All the Hysteria Gone?" *Psychoanalytic Review*, 1979-80, vol. 66, pp. 463-473; Bourneville, Désiré Magloire and P. Regnard. *Iconographie Photographique de la Salpêtrière*. Paris: Progres-Medical, 1878, vol. 2, pp. 97-219; Charcot, Jean-Martin. *Clinical Lectures on Certain Diseases of the Nervous System*, transl. by E. P. Hurd. Detroit: G. S. Davis, 1888, p. 141; Ellis, Havelock. *Studies in the Psychology of Sex*, vol. 1, New York: Random House, 1940, p. 270; Krohn, Alan, *Hysteria: The Elusive Neurosis*. New York: International Universities Press, 1978, pp. 46-51; McGrath, William J., *Freud's Discovery of Psychoanalysis: the Politics of Hysteria*. Ithaca, NY: Cornell University Press, 1986, pp. 152-172; Veith, Ilza, *Hysteria: The History of a Disease*. Chicago: University of Chicago Press, 1965; Wittels, Franz, *Freud and His Time*. New York: Grosset and Dunlap, 1931, pp. 215-242; and Ziegler, Dewey and Paul Norman, "On The Natural History of Hysteria in Women," *Diseases of the Nervous System*, 1967, vol. 15, pp. 301-306.
- [9] Bauer, Carol, "The Little Health of Ladies: An Anatomy of Female Invalidism in the Nineteenth Century," *Journal of the American Medical Woman's Association*, October 1981, vol. 36, no. 10, pp. 300-306; Ehrenreich, Barbara and D. English, *Complaints and Disorders: The Sexual Politics of Sickness*. Old Westbury, NY: Feminist Press, 1973, pp. 15-44; and Trall, Russell Thacher, *The Health and Diseases of Women*. Battle Creek, MI: Health Reformer, 1873, pp. 7-8.
- [10] Sydenham Thomas, "Epistolary Dissertation on Hysteria," in *The Works of Thomas Sydenham*, transl. by R. G. Latham. London: Printed for the Sydenham Society, 1848, vol. 2, pp. 56 and 85; and Payne, Joseph Frank, *Thomas Sydenham*. New York: Longmans, Green and Co., 1900, p. 143.
- [11] Only a minority of writers on hysteria associated the affliction with paralysis until Freud made this part of the canonical disease paradigm in the twentieth century.
- [12] Gall, Franz Josef, *Anatomie et Physiologie du Système Nerveux en Général*. Paris: F. Schoell, 1810-1819, vol. 3, p. 86; Tripier, Auguste Élisabeth Philogene, *Leçons Cliniques sur les Maladies de Femmes*. Paris: Octave Doin, Editeur, 1883, pp. 347-351; Highmore, Nathaniel, *de Passione Hysterica et Affectione Hypochondriaca*. Oxon.: Excudebat A. Lichfield impensis R. Davis, 1660, pp. 20-35; and Ellis, *Studies in the Psychology of Sex*, vol. 1, p. 225; see also Briquet, Pierre, *Traité Clinique et Thérapeutique de l'Hystérie*. Paris: J. B. Baillière et Fils, 1859, pp. 137-138, 570 and 613.
- [13] Cullen, William, *First Lines in the Practice of Physic*. Edinburgh: Bell, Bradfute, etc., 1791, pp. 43-47; Burton, Robert, *The Anatomy of Melancholy*, Floyd Dell and Paul Jordan Smith, eds. New York: Farrar and Rinehart, 1927, pp. 353-355; Horst, Gregor, *Dissertationem . . . inauguralem De Mania . . . Gissae: typis Viduae Frederici Kargerii*, 1677, pp. 9-18; King, A. F. A., "Hysteria," *American Journal of Obstetrics*, May 18, 1891, vol. 24, no. 5, pp. 513-532; *Medieval Woman's Guide to Health*, transl. by Beryl Rowland. Kent, OH: Kent State University Press, 1981, pp. 2, 63 and 87; Pinel, Philippe, *A Treatise on Insanity*, transl. by D. D. Davis. Facsimile edition of the London 1806 edition; New York: Hafner, 1962, pp. 229-230; and Reich, Wilhelm, *Genitality in the Theory and Therapy of Neurosis*, transl. by Philip Schmitz. New York: Farrar, Straus and Giroux, 1980 (reprint of 1927 edition), pp. 54-55 and 93.
- [14] Zacuto, Abraham. *Praxis Medica Admiranda*. London: Apud Ioannem—Antonium Huguetan, 1637, p. 267. Zacuto is at pains to point out that some physicians regard vulvular massage as indecent: "Num autem ex hac occasione, liceat Medico timenti Deum, sopitis pariter cunctis sensibus, & una abolita respiratione in foeminis quasi animam agentibus, seu in maximo vitae periculo constitutis, veneficium illud semen, foras ab utero, titillationibus, & frictionibus partium obscenarium elidere, different eloquenter . . ."
- [15] October-November, p. 4. Kellogg's background is described in detail in Schwarz, Richard W., *John Harvey Kellogg, MD*. Nashville: Southern Publishing Association, c1970.
- [16] Women who regularly undergo the discomfort of gynecological examination with this instrument are justifiably amused by its nineteenth century mythology. For an example of conservative views on the speculum, see Griesinger, Wilhelm, *Mental Pathology and Therapeutics*, transl. by C. Lockhart Robinson and James Rutherford. London: New Sydenham Society, 1867, p. 202. On the inefficiency of penetration as a means to female orgasm, the standard modern work is of course Hite, Shere, *The Hite Report on Female Sexuality*. New York: MacMillan Company, 1976, but the phenomenon was widely noted by progressive physicians and others before the seventies. Most of these latter, however, regarded the failure of penetration to fully arouse about three-quarters of the female population as either a pathology on the women's part or as evidence of a natural diffidence in the female. Hite is the first to point out that the experience of the majority constitutes a norm, not a deviation. For examples of various male views on this subject, see Hollender, Marc H, "The Medical Profession and Sex in 1900," *American Journal of Obstetrics and Gynecology*, vol. 108, no. 1, 1970, pp. 139-148; Degler, Carl, "What Ought to be and What Was," *American Historical Review*, vol. 79, 1974, pp. 1467-1490; and his *At Odds: Women and the Family in America from the Revolution to the Present*. New York: Oxford University Press, 1980, pp. 249-278; and Tourette, Gilles de la., *Traité Clinique et Thérapeutique de l'Hystérie Paroxystique*. Paris: Plon, 1895, vol. 1, p. 46. Feminine views are seldom recorded before this century; a few examples are those reported by Katherine B. Davis, summarized in Dickson, Robert L. and Henry Pierson, "The Average Sex Life of American Women," *Journal of the American Medical Association*, vol. 85, 1925, pp. 113-117; Lazarsfeld, Sofie, *Woman's Experience of the Male*. London: Encyclopedic Press, 1967, pp. 112, 181, 271 and 308. It has also been noted that few women have difficulty achieving orgasm in masturbation, and that the median time to orgasm in masturbation is substantially the same in both sexes: Kinsey, Alfred Charles, *Sexual Behavior in the Human Female*. Philadelphia: Saunders, 1953, p. 163.
- [17] Dowse, Thomas Stretch, *Lectures on Massage and Electricity in the Treatment of Disease*. Bristol: John Wright and Co., 1903, p. 181.
- [18] Smith, E. H., in *Pacific Medical Journal*, February 1903.

- [19] For examples of spa expenses in the United States, see Cloyes, Samuel A., *The Healer; the Story of Dr. Samantha S. Nivison and Dryden Springs, 1820-1915*. Ithaca, NY: DeWitt Historical Society of Tompkins County, 1969, p. 24; Karsh, Estrellita, "Taking the Waters at Stafford Springs," *Harvard Library Bulletin*, July 1980, vol. 28, no. 3, pp. 264-281; McMillan, Marilyn, "An Eldorado of Ease and Elegance: Taking the Waters at White Sulphur Springs," *Montana*, vol. 35, Spring 1985, pp. 36-49; and Meeks, Harold, "Smelly, Stagnant and Successful: Vermont's Mineral Springs," *Vermont History*, 1979, vol. 47, no. 1, pp. 5-20.
- [20] Taylor wrote indefatigably on the subject of physical therapies for pelvic disorders, and devoted considerable effort to the invention of mechanisms for this purpose. See Taylor, George Henry, *Diseases of Women*. Philadelphia and New York: G. McClean, 1871; *Health for Women*. New York: John B. Alden, 1883 and eleven subsequent editions; "Improvements in Medical Rubbing Apparatus," U.S. Patent 175,202 dated March 21, 1876; *Mechanical Aids in the Treatment of Chronic Forms of Disease*. New York: Rodgers, 1893; *Pelvic and Hernial Therapeutics*. New York: J. B. Alden, 1885; and "Movement Cure," U.S. Patent 263,625 dated August 29, 1882.
- [21] An example of the early Weiss model is available for study at the Bakken (Library and Museum), Minneapolis, MN, accession number 82.100.
- [22] Mortimer Granville, Joseph, *Nerve-Vibration and Excitation as Agents in the Treatment of Functional Disorders and Organic Disease*. London: J.&A. Churchill, 1883, p. 57; his American colleague Noble Murray Eberhart advises against vibrating pregnant women "about the generative organs" for fear of producing contractions. See his *A Brief Guide to Vibratory Technique*. 4th ed. rev. and enl. Chicago: New Medicine Publication, c1915, p. 59. For examples of enthusiastic endorsements of the new technology, see Gottschalk, Franklin Benjamin, *Practical Electro-Therapeutics*. Hammond, IN: F. S. Betz, 1904; the same author's *Static Electricity, X-Ray and Electro-Vibration: Their Therapeutic Application*. Chicago: Eisele, 1903; International Correspondence Schools, *A System of Electrotherapeutics*. Scranton, PA: International Textbook Company, 1903, vol. 4; Matijaca, Anthony, *Principles of Electro-Medicine, Electro-Surgery and Radiology*. Tangerine, FL, Butler, NJ and New York, NY: Benedict Lust, 1917; Monell, Samuel Howard, *A System of Instruction in X-Ray Methods and Medical Uses of Light, Hot-Air, Vibration and High Frequency Currents*. New York: E. R. Pelton, 1902; Pilgrim, Maurice Riescher, *Mechanical Vibratory Stimulation; its Theory and Application in the Treatment of Disease*. New York City: Lawrence Press, c1903; Rice, May Cushman, *Electricity in Gynecology*. Chicago: Laing, 1909; Rockwell, Alphonse David, *The Medical and Surgical Uses of Electricity*. New ed. New York: E. G. Treat, 1903; Snow, *Mechanical Vibration and its Therapeutic Application*; Waggoner, Melanchthon R. *The Note Book of an Electro-Therapist*. Chicago: McIntosh Electrical Corporation, 1923; Wallian, Samuel Spencer, *Rhythmotherapy*. Chicago: Ouellette Press, 1906; and the same author's "Undulatory Theory in Therapeutics," *Medical Brief*, May and June, 1905.
- [23] See for example, Smith, A. Lapthorn, "Disorders of Menstruation," in *An International System of Electro-Therapeutics*, Horatio Bigelow, ed. Philadelphia: F. A. Davis, 1894, p. G163.
- [24] Covey, Alfred Dale, *Profitable Office Specialities*. Detroit: Physicians Supply Co., 1912, pp. 16, 18, and 79-95; Bubier, Edward Trevert, *Electro-Therapeutic Hand Book*. New York: Manhattan Electric Supply Co., 1900; Duck, J. J. Co., *Anything Electrical: Catalog No. 6*. Toledo, OH: J. J. Duck, 1916, p. 162; Golden Manufacturing Co., *Vibration: Nature's Great Underlying Force for Health, Strength and Beauty*. Detroit, MI: Golden Manufacturing Co., 1914; Gorman, Sam J. Co. *Physician's Vibragenitant*. Chicago: Sam J. Gorman and Co., n.d.; Keystone Electric Co., *Illustrated Catalogue and Price List of Electro-Therapeutic Appliances . . . etc.* Philadelphia: Keystone Electric Company, c1903, pp.63-66; Schall and Son, Ltd., *Electro-Medical Instruments and their Management . . .* 17th ed. London and Glasgow: Schall and Son, 1925; Vibrator Instrument Co., *A Treatise on Vibration and Mechanical Stimulation*. Chattanooga, TN: Vibrator Instrument, 1902; Vibrator Instrument Co. Clinical Dept., *A Course on Mechanical Vibratory Stimulation*. New York City: Vibrator Instrument, 1903; "Vibratory Therapeutics," *Scientific American*, vol. 67, October 22, 1892, p. 265. Most of these manufacturers were quite respectable instrument firms; see Davis, Audrey B., *Medicine and its Technology: An Introduction to the History of Medical Instrumentation*. Westport, CT: Greenwood Press, 1981, p. 22.
- [25] Vibrator Instrument Company, *Chattanooga Vibrator*. Chattanooga, TN: Vibrator Instrument, 1904, pp. 3 and 26.
- [26] Vigouroux, Auguste, *Étude sur la Résistance Électrique chez les Melancoliques*. Paris: J. Rueff et Cie, Éditeurs, 1890; Cowen, Richard J., *Electricity in Gynecology*. London: Baillière, Tindall and Cox, 1900; Engelmann, George J., "The Use of Electricity in Gynecological Practice," *Gynecological Transactions*, vol. 11, 1886; Reynolds, David V., "A Brief History of Electrotherapeutics," in *Neuroelectric Research*, D. V. Reynolds and A. Sjöberg, eds. Springfield, IL: Thomas, 1971, pp. 5-12; and Shoemaker, John V., "Electricity in the Treatment of Disease," *Scientific American Supplement*, January 5, 1907, vol. 63, pp. 25923-25924.
- [27] "Vibratory Therapeutics," *Scientific American*, vol. 67, October 22, 1892, p. 265.
- [28] O'Neill, John J., *Prodigal Genius: The Life of Nikola Tesla*. New York: Ives Washburn, Inc., 1944, p. 210.
- [29] *Medical Brief*, May 1905, p. 417. See also the theory of light vibrations employed in the Master Electric Company's advertising brochure *The Master Violet Ray*. Chicago: n.d.
- [30] Monell, *A System of Instruction*. . . , p. 595; Snow, *Mechanical Vibration*.
- [31] Monell, *A System of Instrumentation* . . . , p. 591.
- [32] See for example, "Wanted, Agents and Salesman . . ." Swedish Vibrator Company, *Modern Priscilla*, April 1913, p. 60.
- [33] "Agents! Drop Dead Ones!" Blackstone Water Power Vacuum Massage Machine, *Hearst's*, April 1916, p. 327; and "Hydro-Massage" Warner Motor Company, *Modern Women*, vol. 11, no. 1, December 1906, p. 190.
- [34] Wall receptacles are a relatively late introduction. See Schroeder, Fred E., "More 'Small Things Forgotten:' Domestic Electrical Plugs and Receptacles, 1881-1931," *Technology and Culture*, July 1986, vol. 27, no. 3, pp. 525-543.
- [35] "Massage is as old as the hills . . .," American Vibrator Company, *Woman's Home Companion*, April 1906, p. 42.
- [36] "Such Delightful Companions!" Star Electrical Necessities, 1922, reproduced in Jones, Edgar R., *Those were the Good Old Days*. New York: Fireside Books, 1959, unpagged; and "A Gift that will Keep her Young and Pretty," Star Home Electric Massage, *Hearst's International*, December 1921, p. 82.
- [37] See for example, the Ediswan advertisement in *Electrical Age for Women*, January 1932, vol. 2, no. 7, p. 274, and review on page 275 of the same publication.
- [38] "Vibration is Life," Lindstrom-Smith Co., *Modern Priscilla*, December 1910, p. 27.
- [39] Pivar, David J. *Purity Crusade: Sexual Morality and Social Control, 1868-1900*. Westport, CT: Greenwood Press, 1973, pp. 110-117.
- [40] See also *American Magazine*, December 1912, vol. 75, no. 2, January 1913; vol. 75, no. 3, May 1913; vol. 75, no. 7, p. 127; *Needlecraft*, September 1912, p. 23; *Home Needlework Magazine*, October 1908, p. 479, October 1915, p. 45; *Hearst's*, January 1916, p. 67, February 1916, p. 154, April 1916, p. 329; June 1916, p. 473, and *National Home Journal*, September 1908, p. 15.
- [41] Davidson, J. E., "Electrical Appliance Sales During 1926," *NELA Bulletin*, vol. 14, no. 2, pp. 119-120.
- [42] December 5, 1925, vol. 86, p. 1164. See also Hughes, George A. "How the Domestic Electrical Appliances are Serving the Country," *Electrical Review*, June 15, 1918, vol. 72, p. 983; Edkins, E. A., "Prevalent Trends of Domestic Appliance Market," *Electrical World*, March 30, 1918, pp. 670-671; and "Surveys Retail Sale of Electrical Appliances," *Printer's Ink*, vol. 159, May 19, 1932, p. 35.

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[35] Rajan, A., "The social impact of information technology," *Oxford Surveys in Information Technology*, Vol. 2, pp. 105-126, 1985.

[36] Raouf, A. and Ahmnad, S. I., *Flexible Manufacturing*, New York: Elsevier, 1985.

[37] Robey, D., "Computer information systems and organization structure," *Communications of the ACM*, Vol. 24, No. 10, pp. 679-687, 1981.

[38] Salerno, L. M., "What happened to the computer revolution?" *Harvard Business Review*, Vol. 63, No. 6, pp. 129-138, 1985.

[39] Saunders, C. S. and Scamell, R. W., "Organizational power and the information services department: A reexamination," *Communications of the ACM*, Vol. 29, No. 2, pp. 142-147, 1986.

[40] Scott, P. B., *The Robotics Revolution: The Complete Guide for Managers and Engineers*, Oxford: Basil Blackwell, 1984.

[41] Shamir, B. and Salomon, I., "Work-at-home and the quality of working life," *Academy of Management Review*, Vol. 10, No. 3, pp. 455-464, 1985.

[42] Sterling, T. D., "Guidelines for humanizing computerized information systems: A report from Stanley House," *Communications of the ACM*, Vol. 17, No. 11, pp. 609-613, 1974.

[43] Warnecke, H. J. and Steinhilper, R., *Flexible Manufacturing Systems*, Bedford: IFS, 1985.

[44] Wynne, B., "The changing roles of managers," in *New Office Technology: Human and Organizational Aspects*, H. J. Otway and M. Peltu (eds), London: Frances Pinter, pp. 138-151, 1983.

[43] "Electrical Devices for the Household," *Scientific American*, January 26, 1907, vol. 96, p. 95.

[44] The vibrator is not included in extensive lists of appliances in Lamborn, Helen, "Electricity for Domestic Uses," *Harper's Bazaar*, April 1910, vol. 44, p. 285; and Knowlton, H.S., "Extending the Uses of Electricity," *Cassier's Magazine*, vol. 30, June 1906, pp. 99-105.

[45] U.S. Bureau of the Census. *Census of Manufactures*, 1908, 1919, and 1947, pp. 216-217, 203, and 734 and 748 respectively.

[46] On the early history of appliances, see Lifshy, Earl, *The Housewares Story*. Chicago: Housewares Manufacturers' Association, 1973. For the safety issue, see "Electromedical Apparatus for Domestic Use," *Electrical Review*, October 22, 1926, p. 682.


[47] *Good Stories*, October 1933, p. 2; see also similar advertisement in the same issue for Dr. Roger's Relief Compound, p. 12.

[48] "Water Stills," *Ainslee's Magazine*, October 1920. p. 164.

[49] See for example, Damark International, Inc., *Catalog B-330*. Minneapolis, MN: Damark International, 1988, p. 7, which emphasizes the "Alambiccus Distiller's" usefulness for distilling herbal extracts.

[50] *Mellow Mail Catalogue*. Cooper Station, New York City: 1984, pp. 32-39.

[51] Levy, Steven, *Hackers: Heroes of the Computer Revolution*. Garden City, NY: Anchor Press/Doubleday, 1984, p. 377.



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