

Chapter 2

The Penile Strain Gauge and Aversion Therapy: Measuring and Fixing the Sexual Body

Abstract The early Cold War had far-reaching effects into the gendered and sexual aspects of adult life. Those effects are clearly evident in the United States and United Kingdom, in which physicians and their assistants used technology to practice aversion therapy on male patients who were sexually “deviant,” including homosexuals, cross-dressers, fetishists, sadists, and masochists. They designed a form of aversion therapy using an electroshock machine together with a penile strain gauge in order to shock those men into heterosexually normative sexual desires and behaviors. The treatment did not work, and physicians abandoned it in the light of the rise of gay rights and amid civil rights movements and professional reinterpretations of homosexuality in the late 1960s and early 1970s. This chapter first describes the setup of early voluntary sex research laboratories, which provided a framework for the setup of laboratories using involuntary subjects. It then details the theoretical framework, based on Martha Nussbaum’s conception of objectification and Michel Foucault’s ideas on the functions of institutions in policing people’s bodies and minds. It describes how aversion therapy (originally using drugs) and the use of electricity on human and animal bodies came together in the mid-1960s in the form of electroshock aversion therapy. That description includes primary-source interviews with patients, doctors, and nurses, all of whom had varying responses to the use of such therapy. The chapter concludes with an explanation of how electroshock aversion therapy largely ended by the mid-1970s and how some doctors, nurses, and patients resisted it.

Keywords Electroshock · Aversion therapy · Penile strain gauge · Homosexuality · Sex research · Cold War

The Cold War in the United States and United Kingdom, as multiple historians have discussed, was a time of gender and sexual policing by individuals, social groups, and mass media culture. It was also a time of medical, and particularly psychiatric, authority (Johnson 2004; Cuordileone 2005; Cook 2007; Cohen 2013). Numerous individuals, particularly homosexual men, but also lesbian women, transsexuals, transgendered individuals, cross-dressers, sadomasochists, fetishists, and pedophiles were at the margins of society. Medical, legal, and political

authorities attempted to change them to conform to societal norms, to push them into changing themselves, and to punish them for nonconforming. The laboratory settings and machines used in sex research during the 1950s and 1960s were often used in the service of such agendas.

As machine-based physiological research in the 1950s and 1960s focused largely on studying or fixing men, researchers oriented and developed their machines mostly for male bodies. The gender and sexual values of the Cold War both supported and were reflected in the sex research done at the time. However, scientists also established broader frameworks and practices for the use of machines in sex research that set the stage for studies that would ultimately be more liberating than restrictive. Human sex research using machines developed in two main directions in the 1950s and 1960s: one in which individual, largely isolated researchers invented and experimented with various types of machines to pursue their interests in sexual physiology. The second avenue of research used machines as tools to normalize men considered “deviant” by cultural, medical, and legal standards. (The third avenue—comparative research with individuals and couples—is the subject of [Chap. 3](#).) Those two early paths of sexual physiology research illustrated two approaches to the role of machines in sexual medicine: one aimed at the discovery of basic physiology, the other toward regulation and punishment. This chapter has four parts—first, a brief overview of the gender and sexual issues in the 1950s and 1960s in the U.S. and U.K.; second, a description of the laboratories and machines used in exploratory research; third, the machines and practices used in aversion therapy; and fourth, resistance tactics that medical staff and patients used to subvert aversion therapy. This chapter illustrates that machines used in sex research were not neutral: they became loci for scientific or self-discovery, fear, pain, resistance, and many other sex-related experiences and emotions.

Historical Background

Elaine Tyler May, in her now-classic book *Homeward Bound*, describes how ideals of containment in the United States intersected nuclear and foreign policies of the Cold War with popular constructions of the white, middle-class, suburban, heterosexual, single-family home (May 1988). She argues that American governmental policies directed toward containing the threats of nuclear energy, the atom bomb, and Communism also included medical and legal policies corralling dangerous social forces so that people could live secure, fulfilling lives. Such social forces prominently included any kind of sexual deviance, so people (often unhappily, as May argues) contained, or tried to contain, themselves as well. They attempted to police their own bodies as Michel Foucault described: to conform inwardly and outwardly to the social mores of the time (Foucault 1977). Legal and medical establishments in the United States and United Kingdom then took on the task of containing people who were unwilling or unable to contain themselves, and

those people were willingly or unwillingly subjected to the power of machines to eliminate the deviant parts of themselves. In addition, an expert culture surrounding marriage was rising, with more and more individuals claiming science-based advice and formulas for marital happiness and success (Minton 1988; Davis 2010; Lewis 2010). Such expertise was often based on the premise that heterosexual marriage was the foundation of a strong American nation, and any departure from that ideal was a threat to national stability (Reumann 2005). May's, Davis's, and Reumann's work also shows the importance of postwar expert culture in enforcing the rules of heterosexual containment, a culture which was similar to but not identical to the sociocultural situation in Britain.

American cultural ideals emphasized domestic stability, security, and the nuclear family following the Depression and the end of World War II. The language of American Cold War politics emphasized the importance of heterosexual masculinity, as the strength of the nation was rhetorically embedded in the physical and moral strength of its adult men. Cold War political culture "put a new premium on hard masculine toughness and rendered anything less than that soft and feminine and, as such, a real or potential threat to the security of the nation" (Cuordileone 2000, p. 516). Homosexual or queer men embodied that particular threat. Historians including John D'Emilio, Estelle Freedman, and David Johnson have written of the heightened tension in postwar sexual politics, particularly the fears of a "homosexual menace" and an accompanying anxiety that homosexuals were aligned with, or tools of, the Communist party (D'Emilio and Freedman 1988; Johnson 2004; Drucker 2010). As Freedman and D'Emilio put it, "the labeling of homosexuals as moral perverts and national security risks, along with the repressive policies of the federal government, encouraged local police forces across the country to harass them with impunity" (D'Emilio and Freedman 1988, p. 293). In a political and cultural atmosphere largely hostile to homosexuality, some physicians took the opportunity to use their medical authority to treat the non-heteronormative nature of men (and some women) as a disease that they could cure in a laboratory setting.

Following World War II in Britain, there was a public cultural and political emphasis on the stability of family traditions and gender roles. Nonetheless, plenty of signs existed that the values and the traditions of the Victorian, heterosexual, Christian, and reproductive family were fragmenting in the minds of the broader population beginning in the 1950s. By the beginning of the 1960s, Callum G. Brown suggests that British Christian women and men began to feel alienated from church teachings, were less likely to attend religious services, and more likely to engage in premarital intercourse than in the previous decade (Brown 2011). Frank Mort emphasizes the rise in public expressions of scientific expertise in sexual matters and the wider visibility of gay male sexuality and non-marital sexuality widely—along with figures such as "the man about town" and concepts such as the rise of the "pleasure economy" in the 1960s (Mort 2010). After the *Wolfenden Report* appeared in 1957, many physicians saw an opportunity to experiment with using medicine to help people conform to contemporary societal norms (Wolfenden et al. 1957).

The late 1950s through the late 1960s were also opportune years for the British medical establishment to study and perhaps to “fix” homosexuality. After the conviction for “gross indecency” and death by apparent suicide of the scientist Alan Turing, among other widely publicized criminal trials for homosexuality-related offenses, the Conservative government set up a Departmental Committee in 1954 under the leadership of Sir John Wolfenden, vice chancellor of Reading University, to consider homosexual offenses along with prostitution (Daily Mail 2007; Bryant 2012). The *Report of the Departmental Committee on Homosexual Offences and Prostitution* (popularly known as the *Wolfenden Report*), after multiple hearings, interviews, and debates, was finally published in 1957. It recommended the decriminalization of homosexual sex in private between consenting adults over the age of 21; that buggery (sodomy) be reclassified from a felony to a misdemeanor criminal offense; that estrogen treatment should be available to any man who wanted it; and that physicians should continue to research the causes of—and treatments for—homosexuality (Dickinson 2012, p. 110). The committee concluded that homosexuality was not a disease, but that men who wanted medical treatment should be able to seek it. The report did not consider lesbian women, as sex between women was not a crime in the U.K. Treatment aims could involve a change of direction in sexual preference, a better adaptation to life in general, and greater continence and self-control (Wolfenden et al. 1957, p. 66). According to the committee, homosexuals suffered from a “maladjustment to society,” and their treatment could involve estrogen, psychotherapy, help from probation officers, and counseling from clergy (ibid., pp. 66–68).

In the decade between the *Wolfenden Report* and the Sexual Offences Act of 1967 (when male homosexuality was partially decriminalized), many British physicians, particularly psychologists and psychiatrists who felt as though the *Wolfenden Report* gave them a mandate to do so, took it upon themselves to experiment with cures on homosexual men. As Tommy Dickinson put it, “following Wolfenden, there was a distinct altering of notions regarding homosexuality from a criminal perspective to understandings of the subject as pathology. There was a shifting of control and power from the courts to the medical profession, many of whom were optimistically promoting their worth in being able to cure these individuals by reporting successful outcomes” (Dickinson 2012, pp. 133–34). The *Wolfenden Report* helped establish the cultural idea that scientific experts could cure social maladies, as embodied in British citizenry, and that the government had faith that they could do so. One physician hinted that medicine’s inability to find a simple solution to homosexuality led to frustration and anger among medical practitioners, and that those feelings may have been an inspiration to test more extreme solutions. Basil James introduced a 1962 article by describing the failure of psychoanalysis to cure homosexuality as “the feeling of therapeutic impotence which the practitioner so often feels when faced with the problem of homosexuality” (James 1962, p. 768). By the late 1950s, in both the U.K. and U.S., the social and political context for sexual physiology experiments was in place. First, however, physicians needed the right spaces and tools for the job: properly organized research laboratories with machines to measure the

physiological processes that interested them the most. Chief among those was a penile measurement instrument.

The Sex Research Laboratory

The physical space of the laboratory, the placement of instruments and machines within it, and the ways that researchers' and subjects' bodies moved within the laboratory all affected how the research took place, how researchers understood their own investigative practices, and the researchers' results (Latour and Woolgar 1986). Understanding the meaning of laboratory space and its effects on research outcomes is particularly important for analyzing studies of human behavior, as researchers' and subjects' interactivity within the laboratory environment frames how individuals behaved throughout the research process. The laboratory space, its instruments, and its machines also contained or placed limitations on the possible outcomes of the research. The positions of the researchers (inside the laboratory or viewing from outside), the positions and clothing of the subjects, the furniture, audio or video recording equipment, lighting, and temperature of the room all affected the ability of subjects to perform, and the data that the researchers hypothesized that they would find. Close analysis of the space of the human sex research laboratory, along with the actors, the instruments, and practices, shows that laboratory settings provided subjects with some privacy and anonymity but also reinforced certain kinds of sexual behaviors and physiological responses as the only aspects of "normal" sexuality.

Sex research laboratories across the Western world were often remarkably alike whether they were used to study or to change people. Sometimes scientists were simply testing machines to see what tools might work most effectively in the future. Others thought more broadly, considering what just the right set of machines and experiments could identify about the bodily mechanisms of arousal and desire, and what combination of forces in body and mind led to arousal, response, and orgasm. The spaces and instruments of the laboratories, along with the interactions of the researchers with the spaces and instruments, placed constraints on the possibilities for research, regardless of the perspectives and intentions of the researchers themselves. While some furniture and machines permitted a relatively wide range of movement and thought, others restricted the actions of the participants so that a realistic measure of their "natural" behavior was limited.

Past laboratory spaces become visible in the present through the textual descriptions in articles from psychological and other medical journals; from some second-hand descriptions by biographers of sex researchers; and researchers' and participants' firsthand accounts of their experiences. Few of the researchers from the earliest period of machine-based sex research described their laboratory spaces in much detail. Research often took place at hospitals or science laboratories of universities, and most study subjects were college students, patients under the researcher's care, local volunteers solicited through billboard postings, or those

whom Alfred C. Kinsey euphemistically called for his work “friends of the research”: acquaintances, family members, and friends of the lead investigators who were interested in sex, were curious about the research process, and wanted to help the project (Gathorne-Hardy 1998/2004, p. 218). The voluntary research subject, who was usually only given a vague outline of what he or she was about to see and to do, was shown to a small room outfitted with a chair, a slide or film projector, a projection screen, wall outlets, and the measurement devices. Sometimes researchers would be seated behind a one-way mirror and be able to watch the subject; other times they would be in the room watching the patient from behind or audio- or tape-recording the entire proceedings.

Researchers used a wide variety of devices to see if any of them could become standardized equipment. The use of machines moved through phases: as one researcher would seem to get promising results from a new invention, others would try it and get mixed or poor results, and then the machine would disappear. The nascent research community would affirm the success of the few that seemed to deliver results by incorporating them repeatedly into experiments. Whatever devices researchers decided to use, sex research demanded a level of physical intimacy between investigator and subject. The researchers needed to fit all of the devices properly and to instruct the subject in how to use and to adjust the machines if necessary. The most widely used machines for both male and female subjects were respirators to measure breathing, small blood pressure cuffs that fit on fingers, toes, or wrists, electrocardiograms to measure heart rate, electroencephalograms to measure brain activity, and galvanic skin transducers, which measured the levels of sweat or dryness on the skin. The subject was hooked up to the electrocardiograms and electroencephalograms with electrodes. Particular machines were also designed for genitals. For men, the most common device was a mechanical or mercury-in-rubber penile strain gauge, while one researcher developed a scrotal strain gauge that she used in a similar manner (Zuckerman 1971, p. 314; Bell 1975; Bell and Stroebel 1973). The most common machine for women was the vaginal photoplethysmograph (Chap. 4).

The penile strain gauge was initially developed in Tübingen, Germany, in 1936 to measure men’s erections in sleep. Researchers at the University of Tübingen measured the number of erections of a single sleeping man overnight using a metal cuff attached to his penis. Circumferential penile fluctuations were recorded on a kymograph through a magnetic recorder (Ohlmeyer et al. 1944). The metal cuff only measured the presence or absence of an erection, not any specific measurements of penile circumference or rigidity. Ohlmeyer and colleagues later repeated the initial experiment with six more men (Ohlmeyer and Brilmayer 1947). This device inspired other inventions for measuring erection, including a mercury-in-rubber strain gauge.

The late 1940s and early 1950s was a time of innovation in the American development of strain gauge technology generally. As the authors of *The Strain Gauge Primer* put it in 1955, “only the last decade has seen outstanding advancement in the art of strain management” (Perry and Lissner 1955, p. 1). In 1949, the American researcher R. J. Whitney adapted the strain gauge to measure

muscular tension in a subject's arm or leg, using mercury enclosed in a rubber tube attached to a Wheatstone bridge circuit. As he wrote in his initial description of it, "the band... forms a mercury-in-rubber resistance strain gauge, and extension or shortening of the band will give a corresponding increase or decrease in its electrical resistance" (Whitney 1949, p. 6). This measure had great sensitivity, and Whitney intended other doctors to use it to measure blood flow and limb volume in relation to water intake and to record muscular movements. However, the Whitney strain gauge was not adapted to medical use for sexual investigations right away. Beginning in the mid-1960s, though, researchers modified the Whitney strain gauge to measure the change in penile circumference in millimeters (Gibbons et al. 1963; Barlow et al. 1970; Britt et al. 1971; Farkas et al. 1979). In the late 1960s and early 1970s, other researchers modified the original German metal penile strain gauge so that it too could measure penile circumference (Laws and Rubin 1969; Laws and Pawlowski 1973; Laws and Bow 1976; Laws 1977). Both the mercury-in-rubber strain gauge and the mechanical strain gauge remained in use through the mid-1980s, when an electromechanical strain gauge was added to the market of penile measurement devices.

Researchers from the late 1950s onward also used a penile vacuum pump, which measured the displacement of air in a sealed tube placed over the penis. Penile vacuum pumps to restrict blood flow were available as early as the 1860s in France, and they were a near-constant part of quack medical practitioners' toolkits as impotence cures (Seraine 1865; McLaren 2007). Kurt Freund in Czechoslovakia developed a mechanized vacuum device in order to test men who claimed to be homosexual as a means of getting out of the country's two-year compulsory military service requirement (Freund 1957; Freund et al. 1958; Freund 1963; Freund 1965; Chivers and Bailey 2007).¹ Freund believed that a change in penile volume over a certain number of milliliters indicated that the subject was aroused. Physicians could hook the vacuum pump to men who were shown images of men and women in different stages of undress to test for homosexuality, a desire to cross-dress, or pedophilia (McConaghy 1967; Rosen 1973; Rosen et al. 1975; Rosen and Kopel 1977; Rosen and Keefe 1978). Freund wrote toward the end of his career that an unnamed colleague's work on finger plethysmography had inspired his work on penile plethysmography, but he did not detail the process of creating the vacuum pump (Freund 1991). Of course, Freund and the other researchers described below were proceeding on the assumption that an erection meant only one thing: sexual response, even though Kinsey's and his younger colleague Glenn V. Ramsey's research in the 1940s had shown that men's and boy's erections could be responses to sexual and non-sexual stimuli alike, including friction with clothing, taking a shower, watching a war movie, riding in an airplane, or anxiety (Kinsey et al. 1948;

¹ Even though homosexuality was illegal in Czechoslovakia, and admitting to homosexuality could land them in treatment programs designed to make them heterosexual, nevertheless some men preferred to lie about their sexual preferences and go through a treatment program rather than serving in the military (Freund 1991).

Ramsey 1943). Even though erections could indicate a wide range of emotions, researchers considered them only sexually (Fig. 2.1).²

Researchers often showed subjects a set of still or moving images to measure their response: usually a “control” image of landscapes or other nature scenes, some type of sex-related scene that involved varying degrees of nudity (often stills from *Playboy* magazine for men), and a third set of images designed to invoke horror, fear, or disgust. Some researchers also used audiotapes of erotic and non-erotic stories or gave subjects material to read and to then fantasize about, but listening and reading were much less popular. The images or films were often shown in a random order, and subjects were usually given some time to rest in between image sets. The aim behind using horrific images was to compare bodily processes like heart, breath, and pulse rates with different kinds of stressors. Some used images of skin diseases, such as ulcerated legs, but the most common horror images, either film or still, were of Holocaust concentration camps showing living or deceased prisoners (Zuckerman 1971; Wood and Obrist 1968; Bernick et al. 1971). There exists no record of subject reactions to such an extreme juxtaposition of images in a laboratory setting, sometimes without air conditioning or room temperature control, with strangers observing them, being partially or fully nude, and hooked up to at least two machines. Sometimes they were given a small stipend, but probably not enough to offset the strangeness of their experiences. Researchers were often testing what machines would best measure arousal, and while they generally expected heterosexual responses from their oddly posed subjects, sometimes subjects defied those assumptions.

For example, two researchers at Chatham College in Pittsburgh, Pennsylvania, in 1965, used a galvanic skin transducer to study sexual stimuli in twenty women who were seniors in college. The women were attached to the transducer, which fit around the hand and finger, and then were shown images of men and women in various stages of undress. They found that women had the highest skin temperature change when viewing nude still images, whether the images were of men or women. They concluded, “whether or not the responses measured in this study reflected guilt, shock, disgust, or sexual eroticism...the responses may be said to be sexual at least in part” (Loiselle and Mollenauer 1965, p. 277). So subjects sometimes validated and occasionally challenged the heteronormative assumptions of researchers. Most (those not involved in aversion therapy, that is) were generally willing to accept and to include same-sex arousal in their results—if they saw it. It is even clearer that researchers did not know what kinds of techniques and equipment could accurately isolate and then measure something as elusive as sexual arousal and response, let alone what instrument could find the physiological reasons for those phenomena.

² Interestingly enough, no other scientist has ever replicated Ramsey’s research on the different possible meanings of erections. Thus scientists generally presume that the erections they measure indicate sexual response, when the erections also could indicate a reaction of fright, anxiety, or other emotions. John Bancroft pointed out that lack of research at a conference in 2003 (Bancroft in Janssen (ed) 2007, p. 308).

Fig. 2.1 Volumetric penile transducer. Freund et al. (1965), p. 170, Fig. 2. Copyright 1965 by the Society for the Experimental Analysis of Behavior, Inc

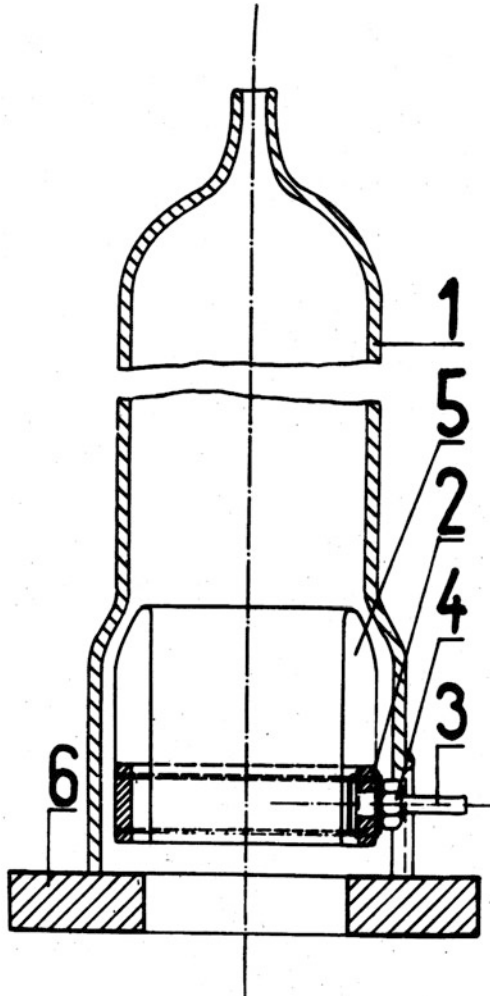


Fig. 2. Components of the assembled transducer.
1 glass cylinder
2 plastic ring
3 metal tube with threads
4 locknut
5 rubber cuff
6 flat soft sponge rubber ring

A reviewer of machine-based sex research summarized the experience of its subjects this way:

The effects of the general experimental situation on the subjects have not been considered in most experiments....Even physiological responses may be influenced...by instructions, or the characteristics and behavior of the experimenter....Failure to consider the human qualities of subjects can often lead to erroneous conclusions in psychological experiments (Zuckerman 1971, p. 326).

The last sentence of this quotation points to a crucial element in the use of machines in sex research. Sometimes researchers were so interested in testing out a machine, the fact that they were using machines on actual human subjects who could feel discomfort or even just puzzlement seemed secondary. Such was the case with the original electroconvulsive therapy (ECT) machine, for example, as after Lucio Bini and Ugo Cerletti first used it in Rome in April 1938, “experiments with the Bini–Cerletti electroshock apparatus continued, as much for the perfection of the machine as for the therapy” (Aruta 2011, p. 412). As researchers were trying to learn more about physiology, their subjects were newly learning how their bodies as sexual objects interacted with machines. Perhaps participating in such research was a lark for them, or perhaps they learned something new about themselves through an unexpected erectile response to a nude same-sex image or experienced heightened blood pressure when hearing an erotic story read aloud. Subjects, doctors, and nurses involved in aversion therapy also learned new ways of being, interacting, testing, and measuring the sexual body. Their interactions with machines would have a different cast than purely voluntary research, as the physician’s intentions—if not the nurses’ and the patients’—were to fix a non-normative sexual body. Thus the role of machines in this type of research shifted to changing the body, rather than to exploring it.

Aversion Therapy

Physicians and their assistants were key participants in the medical treatments that British and American court systems offered sexual deviants instead of jail time. “Although some participants chose to undergo treatments instead of imprisonment or were encouraged through some form of medical coercion, most were responding to complex personal and social pressures that discouraged any expression of their sexuality” (Smith et al. 2004, p. 427). Doctors involved in aversion therapy from the mid-1950s through the mid-1970s thought that machines were especially effective, because they permitted distance between doctor and patient, unavoidable in nausea drug-based aversion therapy. Electromechanical shock machines too, seemed quicker and more effective, but in fact aversion therapies only rarely worked.

Cold War masculinity was linked specifically to technology, as shown by the intersected use of the strain gauge with the electroshock machine to police male sexuality. While the strain gauge measured erection, the electroshock machine, in ways that hormonal or medicinal treatments for aversion therapy could not, gave medical practitioners the perception that they could retrain a man’s sexuality through the use of seemingly invisible techniques. Put together, these devices would contain, constrain, and shape Cold War era masculinity into a socially acceptable form. Containment of bodily desire would lead to containment of personal and national risk (Cuordileone 2005). Anyone who did not conform to such masculine ideals could be, and often was—to borrow the title of Foucault’s well-known work—disciplined and punished (Foucault 1977). Machines permitted

researchers to treat patients like objects that needed fixing, not subjects with autonomy. However, there was room for male subjects (and sometimes for their nurses) to subvert these disciplines and to use them against the medical communities' attempts to change them.

Aversion therapies were well-known treatments in the Cold War era, especially as a cure for alcoholism. By the early 1960s, however, they had become popular with physicians seeking to cure homosexual desire and behavior and to replace it with heterosexual desire and behavior. The now-classic 1971 film, *A Clockwork Orange*, depicts a nightmarish version of aversion therapy called the Ludovico Treatment used on the main character, Alex, who is in prison for murder. He is placed in a straightjacket, his eyes are held open with a machine while a technician drops liquid into his eyes, and doctors show him films with Nazis marching and destroying buildings while his favorite Beethoven music plays over the top. At one point he screams, "Stop it, stop it, please I beg you." The male doctor replies, "I'm sorry, Alex. This is for your own good. You have to bear with us for a while." Alex screams that he has seen the light and is cured, but the Nazi films continue in front of his artificially opened eyes. The idea that a patient who wanted to be cured of a particular desire must associate his most beloved feelings and experiences with atrocities was the logic of aversion therapy.

The two theoretical works that frame the following discussion of aversion therapy are Foucault's *Discipline and Punish* and Martha Nussbaum's "Objectification" (Foucault 1977; Nussbaum 1995). Foucault describes how officials in the military, prison, educational, and hospital institutions of late eighteenth-century France began to exert control over the movement of bodies. "The human body was entering a machinery of power that explores it, breaks it down, and rearranges it." That "mechanics of power" determined "how one may have a hold over others' bodies, not only so that they may do what one wishes, but so that they may operate as one wishes" (Foucault 1977, p. 138). Elizabeth Grosz furthers Foucault's emphasis on the importance of hospitals' powers over unruly bodies, pointing out that "the increasing medicalization of the body...demonstrate[s] a body pliable to power, a *machinic* structure in which 'components' can be altered, adjusted, removed, or replaced. The body becomes increasingly regarded as functional" (Grosz 1995, p. 35, emphasis in original). Institutional control over the physical movement of bodies, particularly using machines, and the internal processes that governed their actions thus literally reshaped the body politic. Foucault's description of how disciplinary powers create "docile bodies" elides neatly with Nussbaum's seven-part breakdown of the ways that humans can objectify others. Nussbaum's theory shows how aversion therapy could objectify a patient using a seven-part concept of objectification: instrumentality, denial of autonomy, inertness, fungibility, violability, ownership, and denial of subjectivity (Nussbaum 1995, p. 257). Using that breakdown of objectification, particularly focusing on the denial of autonomy and subjectivity, shows that from the 1950s through the 1970s, even innocuous-seeming machines such as film projectors and tape recorders served as tools for medical practitioners to deny homosexual and other so-called deviant persons their autonomy and subjectivity.

Well before electroshock became part of aversion therapy, there was a long history of people using machines to police the human body. With the development of widely available commercial electricity networks in urban areas in the 1880s came the use of electricity on human and animal bodies. The most obvious and visible type of electricity applied directly to human bodies was the electric chair, seen in highly publicized photographs in the 1920s, and particularly in the photograph of the American convicted murderer Ruth Snyder's death by electrocution in 1928 (Shahid 2008). The first mention of electroshock therapy for "curing" homosexuality in English was a short notice in the *Psychological Journal* in 1935. That article had very little detail, as it was only a paragraph-length record of a conference paper, but in it the psychologist Louis Max stated that he gave a man electric shocks in conjunction with his homosexual fantasies, aiming to cause "a diminution of the emotional value of the sexual stimulus" (Max 1935, p. 734). After three months of treatment, the man claimed to be "95 per cent cured" (ibid.). Electroconvulsive therapy, as briefly mentioned above, was first developed in Italy in the late 1930s to treat severe depression and schizophrenia (Dickinson 2012, pp. 148–149; Aruta 2011). The patient was given a strong shock with electricity directly applied to the head, which induced an immediate seizure and often unconsciousness. Several members of a hospital's medical staff needed to hold the patient down to ensure that he or she did not self-injure or fall off the bed or examination table. Aversion therapy for homosexuality, by contrast, used a much lower amount of electricity applied to the arm or leg that caused a shock through the limbs but did not cause the seizure and unconsciousness that ECT did. As physicians continued to use ECT to treat severe mental illness, others began to apply smaller amounts of electricity in aversion therapies in order to cure mental conditions they considered problematic but less debilitating, including homosexuality.

It was in the mid-1950s, at a peak of the Cold War internationally, that books and articles were published describing experiments with aversion therapies, usually for alcoholism, but also for smoking, fetishes (such as for shoes, lingerie, or baby carriages), "obsessional ruminations," and even for writer's cramp (Raymond and O'Keeffe 1965; Liversedge and Sylvester 1955; Hilgard 1961; Raymond 1956; Russell 1970). The only machines used at this point were audiotapes, and sometimes films or projected still images. Most aversion therapies were conducted using a classical conditioning technique, in which therapists attempted to get the patient to associate his or her behavior with nausea, physical pain, and the idea that the behavior was truly sick and needed to be abandoned (Rachman 1961). Physicians or their assistants gave patients a nausea drug at two- to three-hour intervals, deprived them of sleep, and often woke them to view still images or to listen to an audiotape about the terribleness of their behavior and the goodness of stopping it. Sometimes, therapists asked patients to tape-record their own thoughts about their behavior and why it was good or enjoyable, and then that audiotape was overlaid with messages repeatedly using the words "sickening" and "nauseating," and describing how the person needed to give it up to live a so-called normal life. In one 1962 case, a male homosexual with a Kinsey 6 rating (attraction to his own sex alone) was subjected to the juxtaposition of a tape-recording of his verbal fantasies with nausea drugs every

two hours for thirty hours straight. After a twenty-four-hour rest, the treatment was repeated for another straight thirty-two hours (James 1962). Thus, Aldous Huxley's *Brave New World*, with its depiction of sleep-based mental-conditioning audio for children, came to life for adults (Huxley 1932). The effect of using a patient's own words and interests against them was depicted clearly in *A Clockwork Orange*. Some patients, who were deprived of sleep for long periods, felt temporarily cured, but some also experienced complete nervous breakdowns, and one developed a heart condition as a result.

Psychiatrists in the late 1950s and early 1960s, many of whom invested their careers in the idea of medicine as a therapeutic vehicle to normalcy, began to turn their attention to the usefulness of electric shock therapy as a replacement for nausea drugs. Descriptions of the shock treatment often sound like this 1964 article by R. J. McGuire titled "Aversion Therapy by Electric Shock: A Simple Technique":

The use of the [electroshock] apparatus follows classical conditioning technique. The stimulus to which aversion is to be produced is presented, often by having the patient imagine the stimulus. This procedure is repeated throughout the treatment session of 20 to 30 min, which can be held from six times per day to once a fortnight. The strength of the shock should be adjusted so it is as painful as the patient can bear... After initial instruction he can treat himself and may take the apparatus home to continue the treatment there (McGuire and Vallance 1964, p. 151).

Such an arrangement also "saves the therapist's time" (*ibid.*). The advantages of electroshock for changing sexual desire were frequent subjects in medical literature; other authors wrote that "electric aversion has largely supplanted chemical aversion as it is safer, easier to control, more precisely applied, and less unpleasant" (Bancroft and Marks 1968, p. 30). The literature on electroshock aversion therapy frequently compared it to aversion therapy using nausea drugs, claiming how much easier and less messy the former was to administer (William 2010). Another advantage, according to one therapist, included that the "therapist is in a position to administer a discrete stimulus of precise intensity for a precise duration of time at precisely the required moment" (Rachman 1965, p. 291). Thus "the greater control which is possible with electrical stimulation should ensure more effective treatment, closer definition of the treatment process and increased theoretical clarity" (*ibid.*).

The electroshocks were administered with a cuff attached to a man's arm, wrist, ankle, or leg, or via an electrified grid on the floor on which the patient sat or stood with bare feet (McGuire and Vallance 1964; Audrey 2010). Sometimes the shocks happened while the patient observed films or slide photographs of nude or semi-nude males (known or unknown to him); sometimes they were administered at random; and occasionally at other times when the patient signaled the therapist that his homosexual fantasy was clear.³ The shock treatments were administered

³ A female doctor remembered how machines separated patients and medical staff during treatments: "It was the nurse therapists who actually gave the aversion therapy, although it was automated, and the nurse therapist would sit in another room when the treatment was taking place. I can't remember now whether they had a one-way mirror or something like that... There

for four to eight weeks at a time, several days per week, on-and-off for ten- to thirty-minute periods. One psychiatrist wrote that the treatments “continued until either a change of interest occurs or it becomes clear that no change is likely. A number of patients...have discontinued treatment of their own accord” (MacCullough and Feldman 1967a, p. 594). The practitioners sometimes shocked themselves to test the machines and sometimes by accident, as one psychologist active in the practice from 1966 through 1971 stated: “It was most unpleasant and the voltage was a jagged alternating voltage so that it had a very unpleasant fizzing feel. I had hundreds of shocks from the thing—sometimes not intended—but we did test it very thoroughly on ourselves and we all knew exactly what it was like” (James 2010, p. 3; see also Paul 2010).

The electroshock machines themselves were often cheaply and poorly designed. A male nurse remembered: “The treatments were so contrived! I mean to see a doctor coming in with a slide projector and a handful of slides, and setting it up, and then putting a couple of electrodes on this lad’s body, and plugging him [in]to this machine—it was even crueler than ECT... And I remember asking the Charge Nurse: ‘By administering the shock where is the treatment?’ And of course this was regarded as an insolent and impertinent question” (Dickinson 2012, p. 304). A man who was an eighteen-year-old apprentice electrician at a hospital in the early 1960s described in an interview that a psychiatrist asked him to build a machine that would shock patients according to when the patient switched one or two 16 mm film projectors (one showing male images, one showing female images) on or off. The doctor had no money for the machine, so the electrician built it using spare parts. He built a contraption with a copper tube that measured shaking on the bed, and a leather strap connected the patient’s penis to a wire, which then linked to the shock machine. He did not seem to have much faith that the machine worked, or that the patients wanted to be cured: “The patients did it to please [the doctor] so they wouldn’t have to go to prison” (George 2010, pp. 2–3). A man in his first year of residency as a clinical psychologist was assigned to administer shock treatments: “It would be the patient and I in a darkened room with an elaborate Heath Robinson set up that the psychiatrist had built.⁴ The psychiatrist had practical skills of hydraulics and electric switches and he just happened to put

(Footnote 3 continued)

was some sort of physical barrier between the nurse and the patient” (Elliot 2010, p. 2). A junior male psychologist recalled how he could sometimes not even see the patients whom he was treating: “You didn’t really have that much contact with the patients. The room was basically a broom cupboard. Literally it had been a broom cupboard and it was cleared out or so I was told.... I would strap two electrodes on the wrist. Occasionally I seem to remember some people seemed to prefer it on the leg. But it was mostly on the wrist. They’d be on one side of the screen where you projected the slides and I’d be on the other side. You really wouldn’t see them even if the light was on. I’d be on the other side operating the projector and the electric shock apparatus” (Isaac 2010, pp. 1–2).

⁴ “Heath Robinson” is a term used in British English, named for the cartoonist W. Heath Robinson (1872–1944), which refers to a machine or device that is unnecessarily complicated to achieve a simple task (Carswell 2012).

it together. It was very amateurish” (Isaac 2010, p. 1; see also Audrey 2010). The crudeness of these machines showed how under-theorized and under-tested they were. The doctors themselves unsure of what treatments were effective, so they tested a variety of electroshock machines at patients’ expense.

One homosexual participant in a 2004 interview series with British aversion therapy patients was coerced into receiving treatment when an undercover police officer entrapped and arrested him in a public place for importuning: “I was given the option, prison or hospital... [I] knew it was not going to make me straight, I didn’t want it to, but it seemed a better option than prison” (Smith et al. 2004, p. 428). In the same interview series, a cross-dressing patient recalled how electroshock therapy was conducted in a British National Health Service hospital: ‘I remember sitting in the room on a wooden chair “dressed” [in women’s clothes], but I had to be barefoot as my feet had to touch the metal electric grid. My penis was also wired up to something to measure if I got an erection—I felt totally violated... I remember the excruciating pain of the initial shock; nothing could have prepared me for it. Tears began running down my face and the nurse said: “What are you crying for? We have only just started!”’ (ibid.). All participants in the interview series (seven male, two now female) reported that the treatment they received still disturbed them. Said one, ‘I can still have terrible flashbacks of my time in hospital and the barbaric treatments I received.’ Said another, ‘I just don’t know how something so tortuous could have been concealed under the term “health care”’ (ibid).

In 1966, the British physician John Bancroft and two colleagues decided to put electroshock therapy together with the penile strain gauge (Bancroft et al. 1966). Combining the two machines was a way to harness the power of them both at the same time: the strain gauge detected erections, and then the shock device would automatically shock the patient if his erection went over a certain circumference. Previous electroshock treatment depended on the therapist or an assistant to administer the shocks, and on the patient who reported when he was about to have an orgasm, when a cross-dresser was wearing women’s clothing, or when a gay man or cross-dresser was having a sexual fantasy. Joining these devices distanced therapists further from what they were doing to the patient. They did not have to notice when the patient had an erection or have to listen to them speak about or notice their desires; the machines together did the work for them (Fig. 2.2).

Machine-based aversion therapy was an attempt to do two things: to rid the individual of homosexual feelings and desires and to replace them with heterosexual feelings and desires. Most of the time, however, it erased homosexual feelings and desires by replacing them with no sexual desires at all. Such negative effects from the treatment were fairly common. In a feasibility study of ten men whom Bancroft treated in 1969, one developed phobic anxiety to attractive men and attempted suicide; one became aggressive, attempted suicide and was anorgasmic in homosexual relationships; one developed serious rejection by women; one became psychotically depressed and wandered into the streets removing his clothes, and one became disillusioned by the homosexual world and could no longer sustain emotionally rewarding relationships (Bancroft 1969; Bancroft 1974;

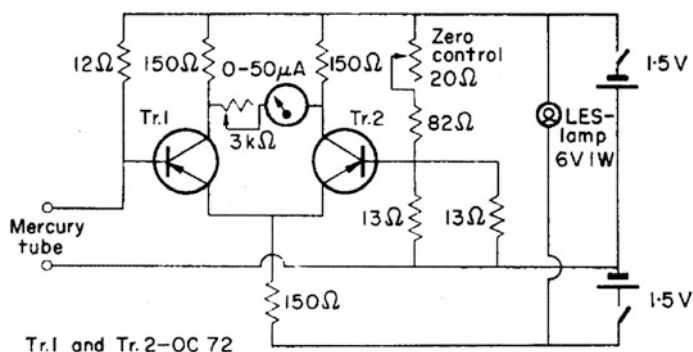


Fig. 2.2 A circuit diagram of a penile strain gauge transducer. Bancroft et al. (1966), p. 239, Fig. 2. Copyright Elsevier, 1966

Smith et al. 2004). On the other hand, more machines did not equal better results, and doctors frequently expressed their frustration with their lack of permanent and lasting success. The treatments seemed to turn patients straight in the short-term—three to six months—if they had some heterosexual experience or interests before they began therapy. But as more time passed, the effects of the aversion therapy would wear off, and for “Kinsey 6s,” or men and women with no heterosexual inclinations at all, the treatment had little to no effect on their homosexual desire or orientation (MacCullough and Feldman 1967a, p. 594; James and Early 1963).

Doctor’s descriptions of aversion therapy in this era echo Jürgen Habermas’s description of the dangers of allowing the values of technology producers and users, specifically efficiency and productivity, to direct workflow in industrial societies rather than allowing for debates over such norms to occur (Habermas 1970; Bimber 1994). The use of aversion therapy echoed contemporary Western values of the 1960s that advocated the incorporation of ever newer, better, and faster machines and technology into everyday private and public life. Electroshock aversion therapy may have looked tidier than other therapies from the outside, but its lack of effectiveness and the deep damage it caused patients left mental scars that haunt them into the present.

Resistance

Psychiatrists and other physicians did not universally accept aversion therapy as a treatment for homosexuality, cross-dressing, and fetishism. After reading the MacCullough and Feldman study, a physician wrote a letter to the *British Medical Journal* criticizing the premise of the study itself, that homosexuals should adjust to societal conventions instead of the reverse: “because of these persons’ unconventional sexual practices they have been conditioned to conventional ones, so much so that it looks as though fornication has become an end in itself” (Kalcev 1967, p. 436;

MacCullough and Feldman 1967a). Kalcev extended the authors' thinking to others who did not conform to contemporary standards of social behavior: "If this treatment gives such satisfactory results is there any reason why enthusiasts should not extend it to conditions such as promiscuity or adultery? And if we extend it to people with less conventional views than ourselves in general we will be in 1984" (Kalcev 1967, p. 436). Kalcev's reference to George Orwell's novel, which depicted a world in which the government intensively scrutinized all citizens' behavior and forcibly purged them of any wrongdoing, struck a nerve with MacCullough and Feldman (Orwell 1949). They countered: "The argument that it is society that is wrong is very misguided. Which seems more unethical: to treat someone in distress, or to suggest to him that he waits until his practice is as socially acceptable as heterosexuality?" (MacCullough and Feldman 1967b). Other possibilities for change, such as homosexuals and their allies working to change society to improve tolerance for people of diverse sexualities, did not occur to them.

While aversion therapy caused many individuals long-lasting mental pain, physical pain and distress, some fought the treatment in ways that physicians did not expect. One reviewer noted some resistance even to basic sex-related experiments that doctors conducted with machines, let alone aversion therapy. Marvin Zuckerman wrote in a 1971 review article, "confronted with prying experimenters attaching electrodes, penile plethysmographs, vaginal devices, and showing pornographic stimuli, many subjects might be inclined to inhibit voluntary response" (Zuckerman 1971, p. 326). Subjects of voluntary sex research often found the machines used to play them images, films, or audiotapes, and to measure their responses strange or invasive, and consciously or unconsciously limited their responses as a reaction to machine-based interactions. So too did the subjects of machine-based aversion therapy for non-heteronormative sexualities. Some patients challenged the machines that hospital staffs used to try and change them. Sometimes, with the help of sympathetic nurses who were themselves opposed to aversion therapy, they would work the system in order to bring their treatment to an end.

For example, physicians were unprepared for the possibility that patients might find the electroshocks themselves erotic. Bancroft and Marks noted in 1968 that two of four male sadomasochists receiving electroshock treatment to arrest their sadomasochism had an increase, rather than a decrease, in their erections during the treatment (Bancroft and Marks 1968, p. 32). Despite some sadomasochists revealing their pleasure in the application of pain, limiting its usefulness as a deterrent, Bancroft and his associates kept trying to use electroshock to rid them of such desire. According to him in 1971, for one patient, "When the masochistic fantasy was involved, the anticipation of a shock resulted in greater erections. As treatment continued there was an increase not only in his erections to masochistic fantasies but also [in] his subjective ratings of sexual interest... It seems possible that the aversive procedure was aggravating the masochistic tendency" (Bancroft 1971, p. 127; see also Sandler 1964). Far from the electrical shock averting sado-masochistic or homosexual feelings, then, the shock became part of the patient's normal sexual fantasies. Thus, for some individuals, the pain of shock caused them pleasure, a situation that the medical staff clearly had no idea how to handle.

If pain was incorporated into pleasure, what other kind of punishment for deviant behavior could they administer? The fact that some patients were given small shock boxes for home use would have excited someone who found erotic stimulation in pain (McGuire and Vallance 1964).⁵ It is clear from the above examples that patients resisted treatments in unanticipated ways.

Nurses and doctors assigned to aversion therapy wards in the 1960s had mixed emotions about and reactions to participating in aversion treatment procedures. Many were disturbed whenever their colleagues seemed to get a thrill out of giving the shocks to patients. A British nurse interviewed in 2010 remembered that “there were also some nurses who you could tell enjoyed administering these aversion treatments. There were others, myself included, who never enjoyed this aspect of their role and considered it barbaric” (Dickinson 2012, p. 202). A female doctor recalled: “I was asked to show some nursing staff and medical students the electric shock equipment, and I picked it up and held these electrodes in my hand and suddenly pressed the button and it was painful. I thought, how can anyone subject themselves to having this? You questioned whether you were getting into a sadomasochistic role” (Elliot 2010, p. 2). Some practitioners denied that they received any pleasure from administering the treatments. “I can’t say I particularly enjoyed administering these treatments. I’m not a sadist at heart” (Isaac 2010, p. 3). When Bancroft reflected on his work in aversion therapy in a 1999 *New York Times* interview, he said that his participation in it embarrassed him now, but that “my motives for doing it were entirely honorable. I just think it was a stage of development in the way we were thinking about it” (Dreifus 1999). His motivation for participating in aversion therapy was to help people that had asked him to help them change, which was rarely a request he heard anymore (ibid.). Physicians who used aversion therapy had a variety of motives for their involvement in it, including a desire to help, a desire for fame or notoriety, a desire to experiment, and perhaps a desire to harm. Whatever those motivations were, the therapy did the majority of patients more harm than good.

Subordinate medical staff with direct contact to patients saw their suffering and tried to alleviate it. One nurse recalled that she only pretended to give a patient a required injection: “It sickened me knowing what we had to do to him in the futile

⁵ The home-use shock boxes did not work any better than the laboratory-based shock treatment. The fiancée, later wife of a man who was given a shock box remembered it this way: “It was a small wooden box which gave him electric shocks. It would be about 4 or 5 inches square with a dial on it and wires. He explained that he’d been told that whenever he felt interest in a man he should give himself this treatment. I never witnessed him using it, so I don’t know how it worked specifically or what his immediate reaction to it was when he gave himself the treatment. He explained that he did use this from time to time and that he felt that the advice he’d been given was that this would help him to get over these homosexual feelings and that he should be able then to lead a ‘normal life.’... For it to work he’d have had to carry it round in his pocket and every time you saw a man you fancied you’d have to go ahead and give yourself an electric shock in order to make sure you took action on any possible opportunity. He’d been assured that by giving himself this treatment this would suppress the urges and eventually they would go away” (Joan 2010, p. 1). See also (Tony 2010).

hope of making him heterosexual. I just thought: ‘Where is the treatment in that? I just couldn’t see any benefit to it—it was punishment and torture’” (Dickinson 2012, p. 242). After a conversation with the patient, she faked giving him the injections, and told him to lie to other staff members that he felt the treatment working and that he was feeling more attracted to women. Her coaching worked, and the man was discharged a few weeks later. He sent her a thank-you note, and told her that he was now living with his boyfriend from before his hospitalization. Both a nurse and a patient at the same hospital remember an incident in which the patient had to receive “social skills training” by going out on a pretend date on the hospital grounds (*ibid.*, pp. 244, 248). Instead the patient did humorous impressions of hospital staff members, the nurse lied to the matron about her impressions of the patient’s progress toward becoming heterosexual, and the patient was discharged a few weeks later.

A male ex-patient reflected around forty years after his treatment in Britain on his experiences with physicians administering aversion therapy:

I don’t think they were either driven or cruel sadist[s]. I think they were deluded by a body of theory, particularly in the institution they worked in, that suggested that this was a successful way of dealing with people with obsessive behaviours as they probably see them. Money is much better spent counseling people to come to terms with their sexuality and live a wholesome and full life and to learn to love themselves again—not inflict more harm (Warren 2010, p. 4).

Unlike physicians, who wanted to adjust patients to the widely anti-homosexual social attitudes and mores at the time, this former patient instead thought that

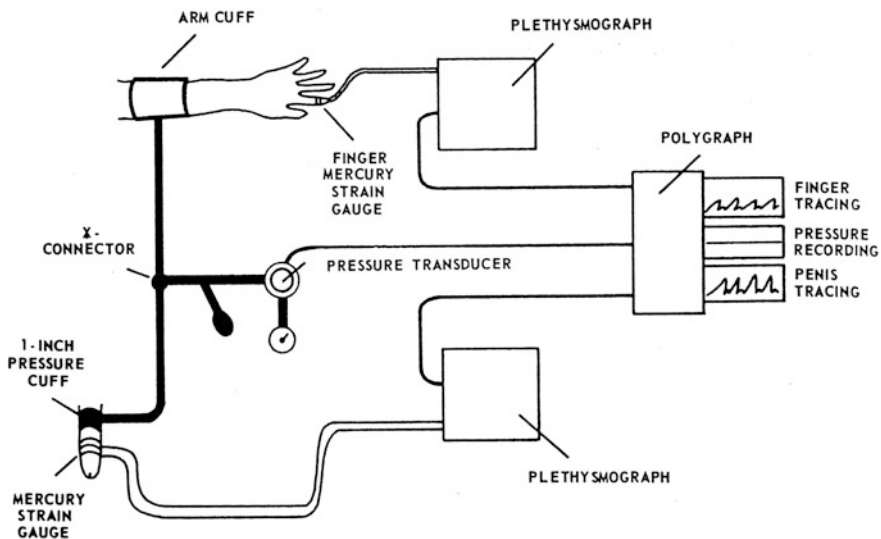


Fig. 2.3 Schematic arrangement of mercury strain gauge plethysmography used to estimate penile blood flow to indicate impotence. Britt et al. (1971) p. 674, Fig. 1. Copyright Elsevier, 1971

society should let people of differing sexualities live fulfilling and happy lives. Rather than teaching self-hate, this man argued, medicine should promote self-acceptance. In the present, this former patient's view of how Anglophone society should operate has been more prevalent, though the idea that homosexuality is a disease has remained (Fig. 2.3).

Conclusion

Aversion therapy slowly lost favor in the Anglophone medical community in the late 1960s and early 1970s as gay and lesbian movements, among other civil rights movements, gained strength. The Sexual Offences Act of 1967 partially decriminalized homosexuality in England and Wales. The Stonewall riots in New York City, which occurred in June 1969 when gay, lesbian, and transgender patrons of the Stonewall Inn fought back against a police raid, galvanized the American homosexual rights movement (Duberman 1994). Two students at the London School of Economics, inspired by the events at Stonewall, created the Gay Liberation Front (GLF) in October 1970 to form a united front against homosexual discrimination (Cook 2007). The American Psychological Association (APA) removed homosexuality from its classification of mental disorders in 1973. The medical, legal, and cultural barriers to homosexuals being allowed full civil rights were beginning to crumble.

This analysis of the use of the penile strain gauge, electroshock therapy, and associated technologies illustrates a recurring theme in the history of technology and its intersection of the history of gender and sexuality: as Nina E. Lerman, Ruth Oldenziel, and Arwen Mohun put it in the introduction to *Gender and Technology*, "When we recognize the role of human choice in shaping social and technical categories and their relationships, we must recognize also that both gender and technology are about power: social, cultural, economic, political" (Lerman et al. 2003, p. 7). Users determine the values of technological devices, and cultural, medical, and legal systems empower those individuals to use devices on or with particular individuals. A political and cultural preference for containment authorized the medical establishment to use technology to cause pain to sexual deviants in the name of disciplining their bodies, curing them, and making them "normal." But professional organizations, government bodies, or the patients themselves could also take away that power.

Moreover, the broader history of sex research devices shows that individuals are not merely passive victims of a techno-medical agenda. They also challenge such agendas, and even unorganized and unrecorded resistances matter for eventual shifts in attitudes and values. For example, the behavior of the sadomasochists in Bancroft's article exemplifies the idea of everyday resistance. As James Scott wrote in his now-classic text *Weapons of the Weak*, "Where everyday resistance most strikingly departs from other forms of resistance is in its implicit disavowal of public and symbolic goals" (Scott 1985, p. 31). Additionally, Scott argues that

“when [individual] acts are rare and isolated, they are of little interest; but when they become a consistent pattern (even though uncoordinated, let alone organized) we are dealing with resistance” (ibid., 296). Thus some individuals subject to aversion therapy were able to resist it, and to use its own tools and machines against itself.

Nussbaum’s theoretical approach sheds light on the fact that men subject to aversion therapy were treated more as objects than as subjects. Anglophone culture at large considered their sexual desires and behaviors so distasteful that it allowed the medical establishment to use machines to deny their subjectivity and agency. Aversion therapy patients were treated more as fungible things, with no feelings or emotions to be accounted for, than as human beings with autonomy. As the doctors sat far away from Alex and the movie projector in *A Clockwork Orange*, so too did the machines of aversion therapy in real life permit doctors to treat those patients with significant distance from their own feelings.

Voluntary human sex research in the 1950s and 1960s was also limited in what it could find on account of the rooms, instruments, and close involvement of the researchers themselves. Subjects could not often freely move due to being hooked up to machines; they may have been shy or intimidated by the immediate presence of the technicians, or found the still images, audiotapes, or films un-stimulating. Researchers usually presumed that their subjects were heterosexual, and they were unsure what to think or how to respond when study subjects behaved differently than expected, particularly when subjects had responses to same-sex images. However, researchers using voluntary subjects were relatively open-minded regarding variation in their subjects’ possible responses. Further, study subjects, as noted above, could disrupt observations, intentionally or not, or could reject researchers’ findings to make their own meanings out of the data that they helped create. Sex research, then, was breaking out of the laboratory spaces in which it was confined and moving out into the wider world.

References

- Aruta, A. 2011. Shocking waves at the museum: The Bini-Cerletti electro-shock apparatus. *Medical History* 55(3): 407–412.
- Audrey. 2010. Using desensitisation. http://www.treatmentshomosexuality.org.uk/images/documents/professional/Using_desensitisation.pdf. Accessed 20 Mar 2013.
- Bancroft, J. 1969. Aversion therapy of homosexuality: A pilot study of 10 cases. *The British Journal of Psychiatry* 115(12): 1417–1431. doi:10.1192/bjpp.115.529.1417.
- Bancroft, J. 1971. The application of psychophysiological measures to the assessment and modification of sexual behaviour. *Behaviour Research and Therapy* 9(2): 119–130. doi:10.1016/0005-7967(71)90069-6.
- Bancroft, J. 1974. *Deviant sexual behaviour: Modification and assessment*. Oxford: Oxford University Press.
- Bancroft, J. 2007. General discussion. In *The psychophysiology of sex*, ed. E. Janssen. Bloomington: Indiana University Press.

- Bancroft, J., and I. Marks. 1968. Electric aversion therapy of sexual deviations. *Proceedings of the Royal Society of Medicine* 61(8): 796–799.
- Bancroft, J.H.J., H.G. Jones, and B.R. Pullan. 1966. A simple transducer for measuring penile erection, with comments on its use in the treatment of sexual disorders. *Behaviour Research and Therapy* 4(3): 239–242. doi:10.1016/0005-7967(66)90075-1.
- Barlow, D.H., et al. 1970. A mechanical strain gauge for recording penile circumference change. *Journal of Applied Behavior Analysis* 3(1): 73–76. doi:10.1901/jaba.1970.3-73.
- Bell, A.I. 1975. Male anxiety during sleep. *International Journal of Psychoanalysis* 56: 455–464.
- Bell, A.I., and C.F. Stroebel. 1973. The scrotal sac and testes during sleep: Physiological correlates and mental content. In *Sleep: Physiology, biochemistry, psychology, pharmacology, clinical implications*, ed. W.P. Koella, and P. Levin, 380–384. Basel: S. Karger.
- Bernick, N., A. Kling, and G. Borowitz. 1971. Physiologic differentiation of sexual arousal and anxiety. *Psychosomatic Medicine* 33(4): 341–352.
- Bimber, B. 1994. Three faces of technological determinism. In *Does technology drive history?*, ed. M.R. Smith, and L. Marx, 80–100. Cambridge: MIT Press.
- Britt, D.B., W.T. Kemmerer, and J.R. Robison. 1971. Penile blood flow determination by mercury strain gauge plethysmography. *Investigative Urology* 8(6): 673–678.
- Brown, C.G. 2011. Sex, religion, and the single woman c. 1950–75: The importance of a “short” sexual revolution to the English religious crisis of the sixties. *Twentieth-Century British History* 22(2): 189–216. doi:10.1093/tcbh/hwq048.
- Bryant, C. 2012. Turing centenary: The trial of Alan Turing for homosexuality. <http://www.polarimagazine.com/features/turing-centenary-trial-alan-turing-homosexual-conduct>. Accessed 17 Mar 2013.
- Carswell, B. 2012. W. Heath Robinson: A complex machine. <http://www.abebooks.com/books/illustration-art-uncle-lubin-william-w-heath-robinson.shtml>. Accessed 21 Mar 2013.
- Chivers, M.L., and J.M. Bailey. 2007. The sexual psychophysiology of sexual orientation. In *The psychophysiology of sex*, ed. E. Janssen, 458–474. Bloomington: Indiana University Press.
- Cohen, D. 2013. *Family secrets: Living with shame from the Victorians to the present day*. London: Viking.
- Cook, M. 2007. Queer conflicts: Love, sex and war, 1914–1967. In *A gay history of Britain: Love and sex between men since the middle ages*, ed. M. Cook, 145–178. Oxford: Greenwood World Publishing.
- Cuordileone, K.A. 2000. “Politics in an age of anxiety”: Cold war political culture and the crisis in American masculinity, 1949–1960. *Journal of American History* 87(2): 515–545.
- Cuordileone, K.A. 2005. *Manhood and American political culture in the Cold War*. New York: Routledge.
- Daily Mail. 2007. Lord Montagu on the court case which ended the legal persecution of homosexuals. <http://www.dailymail.co.uk/news/article-468385/Lord-Montagu-court-case-ended-legal-persecution-homosexuals.html#>. Accessed 19 Mar 2013.
- D’Emilio, J., and E. Freedman. 1988. *Intimate matters: A history of sexuality in America*. New York: Harper & Row.
- Davis, R.L. 2010. *More perfect unions: The American search for marital bliss*. Cambridge: Harvard University Press.
- Dickinson, T. 2012. *Mental nursing and “sexual deviation”: Exploring the role of nurses and the experience of patients, 1935–1974*. Dissertation: University of Manchester.
- Dreifus, C. 1999. A conversation with John Bancroft: Sitting in the ultimate hot seat; the Kinsey Institute. New York Times. <http://www.nytimes.com/1999/05/25/science/conversation-with-john-bancroft-sitting-ultimate-hot-seat-kinsey-institute.html>. Accessed 21 Mar 2013.
- Drucker, D.J. 2010. Male sexuality and Alfred Kinsey’s 0–6 scale: Toward “a sound understanding of the realities of sex”. *Journal of Homosexuality* 57(9): 1105–1123. doi:10.1080/00918369.2010.508314.
- Duberman, M. 1994. *Stonewall*. New York: Plume.
- Elliot. 2010. Doubts about the treatment. http://www.treatmentshomosexuality.org.uk/images/documents/professional/Doubts_about_the_treatment.pdf. Accessed 20 Mar 2013.

- Farkas, G.M., et al. 1979. Reliability and validity of the mercury-in-rubber strain gauge measure of penile circumference. *Behavior Therapy* 10(4): 555–561. doi:10.1016/S0005-7894(79)80056-8.
- Foucault, M. 1977. *Discipline and punish: The birth of the prison*. Trans: A. Sheridan. New York: Vintage.
- Freund, K. 1957. Diagnostika homosexuality u muža [Diagnosing homosexuality in men]. *Cs Psychiatry* 53: 382–393.
- Freund, K. 1963. A laboratory method for diagnosing predominance of homo- or hetero-erotic interest in the male. *Behaviour Research and Therapy* 1(5): 85–93. doi:10.1016/0005-7967(63)90012-3.
- Freund, K. 1965. Diagnosing heterosexual pedophilia by means of a test for sexual interest. *Behaviour Research and Therapy* 3: 229–234. doi:10.1016/0005-7967(65)90031-8.
- Freund, K. 1991. Reflections on the development of the phallogometric method of assessing erotic preferences. *Sexual Abuse: A Journal of Research and Treatment* 4(3–4): 221–228. doi:10.1007/BF00850054.
- Freund, K., J. Diamant, and V. Pinkava. 1958. On the validity and reliability of the phalloglethysmographic (Php) diagnosis of some sexual deviations. *Review of Czechoslovak medicine* 4: 145–151.
- Freund, K., F. Sedlacek, and K. Knob. 1965. A simple transducer for mechanical plethysmography of the male genital. *Journal of the Experimental Analysis of Behavior* 8: 170–171. doi:10.1901/jeab.1965.8-169.
- Gathorne-Hardy, J. 1998/2004. *Sex the measure of all things: A life of Alfred C. Kinsey*. Bloomington: Indiana University Press.
- George. 2010. An apprentice electrician. http://www.treatmentshomosexuality.org.uk/images/documents/professional/An_apprentice_electrician.pdf. Accessed 20 Mar 2013.
- Gibbons, G.E., D.E. Strandness Jr, and J.W. Bell. 1963. Improvements in design of the mercury strain gauge plethysmograph. *Surgery, Gynecology, and Obstetrics* 116: 679–682.
- Grosz, E. 1995. Bodies and knowledges: Feminism and the crisis of reason. In *Space, time, and perversion: Essays on the politics of bodies*, 25–43. New York: Routledge.
- Habermas, J. 1970. *Towards a rational society*. Boston: Beacon.
- Hilgard, E.R. 1961. *Hilgard and Marquis' conditioning and learning*. 2nd ed. Kimble GA (rev), New York: Appleton-Century-Crofts.
- Huxley, A. 1932. *Brave new world*. London: Chatto & Windus.
- Isaac. 2010. Relief and shame. http://www.treatmentshomosexuality.org.uk/images/documents/professional/Relief_and_shame.pdf. Accessed 27 Apr 2013.
- James. 2010. How views change. http://www.treatmentshomosexuality.org.uk/images/documents/professional/How_views_change.pdf. Accessed 20 Mar 2013.
- James, B. 1962. Case of homosexuality treated by aversion therapy. *British Medical Journal* 5280: 768–770.
- James, B., and D.F. Early. 1963. Aversion therapy for homosexuality. *British Medical Journal* 5329: 538.
- Joan. 2010. The wife's story. http://www.treatmentshomosexuality.org.uk/images/documents/patient/The_wife_s_story.pdf. Accessed 20 Mar 2013.
- Johnson, D.K. 2004. *The lavender scare: The cold war persecution of gays and lesbians in the government*. Chicago: University of Chicago Press.
- Kalcev, B. 1967. Aversion therapy of homosexuals. *British Medical Journal* 5562: 436.
- Kinsey, A.C., W.B. Pomeroy, and C.E. Martin. 1948. *Sexual behavior in the human male*. Philadelphia: W. B. Saunders.
- Latour, B., and S. Woolgar. 1986. *Laboratory life: The construction of scientific facts*. Princeton: Princeton University Press.
- Laws, D.R. 1977. A comparison of the measurement characteristics of two circumferential penile transducers. *Archives of Sexual Behavior* 6(1): 45–51. doi:10.1007/BF01579247.

- Laws, D.R., and R.A. Bow. 1976. An improved mechanical strain gauge for recording penile circumference change. *Psychophysiology* 13(6): 596–599. doi:10.1111/j.1469-8986.1976.tb00888.x.
- Laws, D.R., and A.V. Pawlowski. 1973. A multi-purpose biofeedback device for penile plethysmography. *Journal of Behavior Therapy and Experimental Psychiatry* 4(4): 339–341. doi:10.1016/0005-7916(73)90004-9.
- Laws, D.R., and H.B. Rubin. 1969. Instructional control of an autonomic sexual response. *Journal of Applied Behavior Analysis* 2(2): 93–99. doi:10.1901/jaba.1969.2-93.
- Lerman, N.E., R. Oldenzel, and A. Mohun. 2003. *Gender and technology: A reader*. Baltimore: Johns Hopkins University Press.
- Lewis, C.H. 2010. *Prescription for heterosexuality: Sexual citizenship in the cold war era*. Chapel Hill: University of North Carolina Press.
- Liversedge, L.A., and J.D. Sylvester. 1955. Conditioning techniques in the treatment of writer's cramp. *Lancet* 1: 1147–1149.
- Loiselle, R.H., and S. Mollenauer. 1965. Galvanic skin response to sexual stimuli in a female population. *The Journal of General Psychology* 73(2): 273–278. doi:10.1080/00221309.1965.9710721.
- MacCullough, M.J., and M.P. Feldman. 1967a. Aversion therapy in management of 43 homosexuals. *British Medical Journal* 5552: 594–597.
- MacCullough, M.J., and M.P. Feldman. 1967b. Aversion therapy in management of homosexuals. *British Medical Journal* 5570: 51–52.
- Max, L.M. 1935. Breaking up a homosexual fixation by the conditioned reaction technique: A case study. *Psychological Bulletin* 32(11): 734.
- May, E.T. 1988. *Homeward bound: American families in the cold war era*. New York: Routledge.
- McConaghy, N. 1967. Penile volume change to moving pictures of male and female nudes in heterosexual and homosexual males. *Behaviour Research and Therapy* 5(1): 43–48. doi:10.1016/0005-7967(67)90054-X.
- McGuire, R.J., and M. Vallance. 1964. Aversion therapy by electric shock: A simple technique. *British Medical Journal* 5376: 151–153.
- McLaren, A. 2007. *Impotence: A cultural history*. Chicago: University of Chicago Press.
- Minton, H.L. 1988. *Lewis M. Terman: Pioneer in psychological testing*. New York: New York University Press.
- Mort, F. 2010. *Capital affairs: London and the making of the permissive society*. New Haven: Yale University Press.
- Nussbaum, M.C. 1995. Objectification. *Philosophy & Public Affairs* 24(4): 249–291. doi:10.1111/j.1088-4963.1995.tb00032.x.
- Ohlmeyer, P., and H. Brillmayer. 1947. Periodische vorgänge im schlaf [Periodic events in sleep]. *Pflügers Archiv für die gesamte Physiologie des Menschen und der Tiere* 248: 559–560. doi:10.1007/BF00362669.
- Ohlmeyer, P., H. Brillmayer, and H. Hullstrung. 1944. Periodische vorgänge im schlaf II [Periodic events in sleep II]. *Pflügers Archiv für die gesamte Physiologie des Menschen und der Tiere* 249: 50–55. doi:10.1007/BF01764449.
- Orwell, G. 1949. 1984. New York: New American Library.
- Paul. 2010. Unease about the treatment. http://www.treatmentshomosexuality.org.uk/images/documents/professional/Unease_about_the_treatment.pdf. Accessed 20 Mar 2013.
- Perry, C.C., and H.R. Lissner. 1955. *The strain gauge primer*. New York: McGraw-Hill.
- Rachman, S. 1961. Sexual disorders and behavior therapy. *The American Journal of Psychiatry* 118(3): 235–240.
- Rachman, S. 1965. Aversion therapy: Chemical or electrical? *Behaviour Research and Therapy* 2: 289–299. doi:10.1016/0005-7967(64)90036-1.
- Ramsey, G.V. 1943. The sex information of younger boys. *American Journal of Orthopsychiatry* 13(2): 347–352. doi:10.1111/j.1939-0025.1943.tb06004.x.
- Raymond, M.J. 1956. Case of fetishism treated by aversion therapy. *British Medical Journal* 4997: 854–857.

- Raymond, M., and K. O'Keeffe. 1965. A case of pin-up fetishism treated by aversion conditioning. *The British Journal of Psychiatry* 111(7): 579–581. doi:10.1192/bjp.111.476.579.
- Reumann, M.G. 2005. *American sexual character: Sex, gender, and national identity in the Kinsey reports*. Berkeley: University of California Press.
- Rosen, R.C. 1973. Suppression of penile tumescence by instrumental conditioning. *Psychosomatic Medicine* 35(6): 509–514.
- Rosen, R.C., and F.J. Keefe. 1978. The measurement of human penile tumescence. *Psychophysiology* 15(4): 366–376. doi:10.1111/j.1469-8986.1978.tb01393.x.
- Rosen, R.C., and S.A. Kopel. 1977. Penile plethysmography and biofeedback in the treatment of a transvestite exhibitionist. *Journal of Consulting and Clinical Psychology* 45(5): 908–916. doi:10.1037/0022-006X.45.5.908.
- Rosen, R.C., D. Shapiro, and G.E. Schwartz. 1975. Voluntary control of penile tumescence. *Psychosomatic Medicine* 37(6): 479–483.
- Russell, M.A. 1970. Effect of electric aversion on cigarette smoking. *British Medical Journal* 5688: 82–86.
- Sandler, J. 1964. Masochism: An empirical analysis. *Psychological Bulletin* 62(3): 197–204. doi:10.1037/h0040597.
- Scott, J. 1985. *Weapons of the weak: Everyday forms of peasant resistance*. New Haven: Yale University Press.
- Seraine, L. 1865. *De la santé des gens mariés [On the health of married people]*. Paris: F. Savy.
- Shahid, S. 2008. The Daily News's front-page photo of Ruth Snyder's execution (New York Daily News). <http://www.newseum.org/news/2008/01/the-daily-newss-front-page-photo-of-ruth-snyders-execution-new-york-daily-news.html>. Accessed 13 Mar 2013.
- Smith, G., A. Bartlett, and M. King. 2004. Treatment of homosexuality in Britain since the 1950s—an oral history: the experience of patients. *British Medical Journal* 328(7437): 427–429. doi:10.1136/bmj.37984.442419.EE.
- Tony. 2010. Traditional ideas of sex and sexuality. http://www.treatmentshomosexuality.org.uk/images/documents/patient/Traditional_ideas_of_gender_and_sexuality.pdf. Accessed 20 Mar 2013.
- Warren. 2010. Family pressures. http://www.treatmentshomosexuality.org.uk/images/documents/patient/Family_pressures.pdf. Accessed 20 Mar 2013.
- Whitney, R.J. 1949. The measurement of changes in human limb-volume by means of a mercury-in-rubber strain gauge. *Journal of Physiology* 109(Suppl): 5P–6P.
- William. 2010. When the psychiatrist is gay. http://www.treatmentshomosexuality.org.uk/images/documents/professional/When_the_psychiatrist_is_gay.pdf. Accessed 20 Mar 2013.
- Wolfenden, J., et al. 1957. *Report of the departmental committee on homosexual offences and prostitution*. London: Her Majesty's Stationery Office.
- Wood, D.M., and P.A. Obrist. 1968. Minimal and maximal sensory intake and exercise as unconditioned stimuli in human heart-rate conditioning. *Journal of Experimental Psychology* 76((2, pt. 1)): 254–262. doi:10.1037/h0025373.
- Zuckerman, M. 1971. Physiological measures of sexual arousal in the human. *Psychological Bulletin* 75(5): 297–329. doi:10.1037/h0030923.



<http://www.springer.com/978-94-007-7063-8>

The Machines of Sex Research
Technology and the Politics of Identity, 1945-1985
Drucker, D.J.
2014, X, 97 p. 10 illus., Softcover
ISBN: 978-94-007-7063-8