

“PROS-USELESS” TO PROSTHESIS: UNITED STATES PROSTHETICS
PROGRAMS, 1945-1953

by

Virginia A. Pickel, B.S.

A thesis submitted to the Graduate Council of
Texas State University in partial fulfillment
of the requirements for the degree of
Master of Arts
with a Major in History
May 2016

Committee Members:

Jessica Pliley, Chair

Lynn Denton

John Mckiernan-Gonzalez

Rebecca Raphael

COPYRIGHT

by

Virginia A. Pickel

2016

FAIR USE AND AUTHOR'S PERMISSION STATEMENT

Fair Use

This work is protected by the Copyright Laws of the United States (Public Law 94-553, section 107). Consistent with fair use as defined in the Copyright Laws, brief quotations from this material are allowed with proper acknowledgment. Use of this material for financial gain without the author's express written permission is not allowed.

Duplication Permission

As the copyright holder of this work I, Virginia A. Pickel, authorize duplication of this work, in whole or in part, for educational or scholarly purposes only.

ACKNOWLEDGEMENTS

I would like to offer my gratitude to the members of my committee, Dr. Jessica Pliley, Dr. Lynn Denton, Dr. John Mckiernan-Gonzalez, and Dr. Rebecca Raphael, for their guidance, encouragement, and patience throughout this process. I would also like to thank Alan Hawk of the National Museum of Health and Medicine for his assistance in examining Civil War-era artificial limbs. Dr. Katherine Ott of the National Museum of American History introduced me to primary sources associated with Northrop Aircraft's postwar prosthetics program, without which this project would not have been possible. A special thanks goes to Jerry D. Leavy, who agreed to be interviewed and provided valuable first-person insight into the operations of these programs. Finally, I would like to express my sincere gratitude to my family and friends for their love and support during my graduate school career.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iv
LIST OF FIGURES	vi
LIST OF ABBREVIATIONS	viii
CHAPTER	
1. INTRODUCTION	1
2. POSTWAR PROSTHETICS AND GOVERNMENTAL AND CORPORATE COOPERATION	20
3. PERSONHOOD, CITIZENSHIP, AND REINTEGRATION INTO CIVILIAN LIFE	43
4. “TRICKS OF THE TRADE”: AMPUTEES’ ATTEMPTS AT NORMALITY IN THE POSTWAR ERA	71
5. CONCLUSION	104
BIBLIOGRAPHY	111

LIST OF FIGURES

Figure	Page
2.1. Examples of Split-Hook Hands to the Present.....	22
2.2. Examples of Cosmetic Hands to the Present	22
2.3. “Above-knee sockets and methods of suspension: A, total-contact suction socket; B, above-knee leg with Silesian bandage for suspension; C, above-knee leg with pelvic belt for suspension.”	41
3.1. “I’m Proud...” U.S. Government Printing Office, 1944. Source: Library of Congress	49
3.2. “Mother, when will you stay home again?” Adel Manufacturing Corporation, May 1944	51
3.3. “Care is Costly.” U.S. Treasury Poster, 1945	55
3.4. National Employ the Physically Handicapped Week poster, 1951	57
3.5. Jerry Leavy and his father, Towne, 1939.....	61
3.6. Jerry D. Leavy.....	64
3.7. Robert S. Allen.....	65
3.8. Jerry Leavy, Charles McGonegal, & Lonnie Carberry practice bowling, date unknown	68
3.9. “Three Men with Four Limbs and Three Smiles. The ‘amp rehabilitation team’ – legless Herman Pheffer (left) and armless Lonnie Carberry (right) visit the bedside of quadruple amputee Robert Smith, wounded in Korea”	69
4.1. Charles McGonegal shaves with the assistance of his prosthetics, 1944	75
4.2. Charles McGonegal buttons his vest and moves his pocket watch, 1944	77
4.3. Harold Russell writes a letter to his mother five weeks after his injury, 1945	85

4.4. Samuel Goldwyn, Harold Russell, and William Wyler at the 1947 Academy Awards.....	88
4.5. Carnes Company brochure showing Jerry Leavy eating and drinking while using his Carnes arms, c. 1939	90
4.6. Carnes Company brochure showing Jerry Leavy riding a bicycle while using his Carnes arms, c. 1939	91
4.7. Jerry Leavy in his plane, date unknown.....	93
4.8. Jerry Leavy applies soap to his face before shaving, 1968.....	95
4.9. Jerry Leavy buttons his shirt using a buttonhook, 1968	98
4.10. Jerry Leavy drives his car using a steering wheel hook adapter, 1968.....	101
4.11. Jerry Leavy writes purchase orders while talking on the phone, 1968.....	102
5.1. Myoelectric Hand grasping a business card (left) and a coin (right).....	107
5.2. Alan Oliveira (left) of Brazil and Oscar Pistorius (right) of South Africa compete in the Men's 200m Final at the 2012 Paralympics in London	108

LIST OF ABBREVIATIONS

Abbreviation	Description
AFPH	American Federation of the Physically Handicapped
ALMA	Association of Limb Manufacturers of America
CPD	Committee on Prosthetic Devices
DARPA	Defense Advanced Research Projects Agency
FBVE	Federal Board of Vocational Education
FERA	Federal Emergency Relief Administration
IAAF	International Association of Athletics Federations
NARA	National Archives and Records Administration
NIRA	National Industrial Recovery Act
NRC	National Research Council
UCLA	University of California at Los Angeles
VA	Veterans Administration
WMC	War Manpower Commission

CHAPTER 1

Introduction

“They call it a Miracle hand. We consider it a miracle nothing better has been developed. Our nickname for these things is the ‘pros-useless.’”¹ Sol Rael, an army lieutenant and amputee, did not hold a high opinion of his government-issued prosthetic arm. He believed the government provided the best limbs it could find, but the prosthetics of 1945 were, he said, “crude and out-moded and definitely a throw-back to horse-and-buggy days.”² Such was the state of prosthetic limbs at the end of World War II, when approximately 14,000 soldiers and 1,000 sailors had undergone amputations and required some type of prosthesis. Over the next several years, the United States government – through the National Research Council (NRC) and Committee on Prosthetic Devices (CPD) – worked to develop and provide suitable limbs for military and some civilian amputees. Before delving into the specifics of the NRC and CPD contracts, some background on disability history and disability studies is necessary.

Definitions and perceptions of disability have changed dramatically throughout history. Prior to the eighteenth century, most people believed disability was a moral

¹ Statement of Lt. Howard Morse, United States Army, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 13, 1945, 1658. Although this is the statement of Lt. Morse, Lt. Sol Rael interjected a few sentences throughout Morse’s testimony.

² Statement of Lt. Sol Rael, United States Army, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 13, 1945, 1654.

failing, likely a “punishment” from God or some other being. Beginning in the 1700s until the mid-twentieth century, the medical model predominated. Proponents of this paradigm urged treatments and cures for disabled people so they could “perform socially or vocationally in an acceptable manner.”³ This vague definition – complicated by who determines acceptability – frequently prohibited disabled people from asserting their own agency. In fact, able-bodied people ignored the perspectives of disabled individuals when they insisted on placing these allegedly dependent disabled people in long-term medical treatment facilities, such as psychiatric or rehabilitation hospitals. During and immediately following World War II, the medical model prevailed, a belief that was evident in the United States government’s prosthetics programs of the late 1940s and early 1950s. These programs will be discussed in Chapter Two. By the 1960s and 1970s, disabled activists had formulated a new concept – the social model, also referred to as the minority group model. In it, activists stressed, and continue to stress, their socially constructed and stigmatized role within the social and built environment.⁴ For example, wheelchair users experience isolation and exclusion when encountering a flight of stairs. Lennard J. Davis noted one complication of this definition: if barriers cause disability, would *all* people be disabled when they face barriers?⁵ The analysis and growth of the social model continues; however, for the purposes of this research, based as it is in the immediate postwar period, the medical model holds the most significance. Engineers, educators, and businessmen who worked with amputees hoped to “cure” or “fix” not just

³ Paul K. Longmore, “Uncovering the Hidden History of Disabled People,” in *Why I Burned My Book and Other Essays on Disability* (Philadelphia, PA: Temple University Press, 2003): 42.

⁴ *Ibid.*, 49.

⁵ Lennard J. Davis, “Disability: The Next Wave or Twilight of the Gods?,” *PMLA* 120, no. 2 (March 2005): 529.

their bodies, but also their roles as citizens, and sense of self worth.

Prosthetic limbs acted as symbols of both bodily reconstruction and competency that assisted in circumnavigating the emasculation commonly associated with disability. This thesis demonstrates how the American view of disability changed, particularly focusing on the combined efforts of the government and private sectors to reconstruct disabled bodies from 1945 to 1953. It explores the three themes of interaction of technology and the body; personhood and citizenship; and “normality” and social life. Additionally, I will examine concepts of bodily reconstruction and maintaining the status quo through prosthetic limbs, particularly as it related to gender and masculinity. These ideas played a major role in shaping federal policies and national attitudes about disabled people, especially disabled World War II veterans (always conceived of as male bodies to be reformed).

Historiography

Disability studies emerged as a field in the early 1980s when historians and other scholars began to explore questions of how people experienced disability in the past, how society and culture constructed (dis)ability, and the ways that people labeled as “disabled” sought to define their own experiences. Many scholars chose to focus on the medical aspects of disability, but there are subtle distinctions between medical history and disability history, as Beth Linker describes in her essay, “On the Borderland of Medical and Disability History: A Survey of the Fields.” She argues, “while it is true that disability can exist without disease, and vice versa, the two have had an intimate relationship for centuries, and in some cases they are inextricably linked.”⁶ Most medical

⁶ Beth Linker, “On the Borderland of Medical and Disability History: A Survey of the Fields,” *Bulletin of the History of Medicine* 87, no. 4 (Winter 2013): 505.

history, Linker states, emphasized the disease perspective as it relates to disability; very little has been done to center the disabled person's narrative.⁷ As my research pertains to amputees who lost limbs either through wounds received in military service or other traumatic injuries, disease will not be a main factor in my analysis.

Although not specifically related to amputees or prosthetics, Carolyn Thomas de la Peña describes Americans' changing attitudes toward the increasing body and technology connectivity between the end of the U.S. Civil War and the beginning of World War II in her book, *The Body Electric: How Strange Machines Built the Modern America*. Specifically, she states that, during this time, a significant number of Americans bought technology designed specifically to improve their bodies, including muscle-building machines, electric invigorators, and radioactive elixirs. These purchases came into intimate contact with consumers and "normalized" bodily interactions with technology, paving the way for increased acceptance of other technologies.⁸ In no other field was the development of new technologies and the body as intertwined as in the field of prosthetics manufacturing and marketing. For example, in the aftermath of the American Civil War, limb makers had few resources available to construct the prosthetics needed for the 45,000 surviving amputees; therefore, many prostheses were primarily made of wood and generally favored form over function.⁹ Most amputees were more concerned with having naturally appearing hands rather than an unattractive but usable prosthetic, few of which were available until the first split hooks were patented in 1912.

⁷ Linker, "On the Borderland of Medical and Disability History."

⁸ Carolyn Thomas de la Peña, *The Body Electric: How Strange Machines Built the Modern American* (New York: New York University Press, 2003).

⁹ J. Duffy Hancock, "The Evolution of Artificial Limbs," 1929; Palmer, B. F. Artificial leg. US Patent 4.834, issued Nov. 4, 1846.

Yet, after World War II, the prosthetics industry benefited from the waves of stronger, lighter, and more durable materials the Allies had used in their military armaments; additionally, these newer prosthetics often favored functionality over “natural” appearance, as is evident in the development of improved split-hook arms.

Although material advancements were made, technology – especially prosthetic limbs – continued to hold a complicated relationship with societal concepts of gender and citizenship. Citizenship overall has remained an elusive category for disabled people. In *Law and the Borders of Belonging in the Long Nineteenth Century United States*, historian and law professor Barbara Young Welke argues that the axes of ability, race, and gender embedded in American law privileged able-bodied white men above all other groups in terms of personhood, citizenship, and the “borders of belonging.”¹⁰ She described personhood and citizenship as distinct but interdependent. Personhood included legal recognition of an individual and their basic rights of security, well-being, and self-ownership; citizenship included “formal practices and obligations” under the law, such as voting or serving on juries.¹¹ A person could be considered a citizen but, if not granted personhood, may not receive the full benefits of citizenry. Welke defines “borders of belonging” as having “spatial (bodily and territorially) and figurative meaning.” Borders were the physical edges of a nation, the divisions “between individuals and the state, and between different levels of governing authority,” and the distinctions between “physical and psychic personhood (self-ownership).” Similarly, “belonging” included self-

¹⁰ Barbara Young Welke, *Law and the Borders of Belonging in the Long Nineteenth Century United States*, New Histories of American Law (New York: Cambridge University Press, 2010), 4.

¹¹ Katharine Wrobel, “Law and the Borders of Belonging in the Long Nineteenth Century United States,” *Canadian Woman Studies* 29, no. 3 (Spring/Summer 2012): 192–193.

ownership as well as the desire to participate in citizenship.¹²

Welke shows that the law was instrumental in creating a shared identity through “investing elements of identity with legal consequences of inclusion and privilege or exclusion and subordination” and that the former was defined and dependent on the latter. Able-bodied white men maintained their privileged citizenship at the expense of the resources and labor (both manual and reproductive) of disabled people, people of color, and women. Disabled people, however, often found themselves further ostracized within the marginalized groups. For example, women and racial minorities frequently dissociated themselves from the “disability” label when advocating for their own citizenship rights. Welke contends that “[i]n fighting for their own inclusion by distancing themselves from the label disability, [women and racial minorities] gave credence to the idea that disabled persons were justifiably denied equal rights.”¹³ This perception of disabled people as legally subpar or unworthy persisted during the nineteenth century and reverberated throughout the twentieth and into the twenty-first centuries. With few exceptions, society considered disabled people incapable of entering contracts, making medical decisions, or caring for themselves—the markers of personhood and citizenship.

Audra Jennings’s essay in *Disability History*, “Engendering and Regendering Disability: Gender and Disability Activism in Postwar America” provides important context for the association between citizenship, gender ideals, and disability during the World War II era by examining the work of the American Federation of the Physically Handicapped (AFPH). Disabled men and women felt the pressure to conform to

¹² Welke, *Law and the Borders of Belonging*, 4–5.

¹³ *Ibid.*, 78–79.

American heteronormative gender roles while doctors, friends, and family actively discouraged them from pursuing these expectations. Gender roles were reflected in the tropes of “feminized worlds of care” and the “masculine worlds of war and heavy industry.”¹⁴ AFPH women used family – an acceptable female sphere – as a focal point for their activism, advocating for expanded employment and federal aid programs. AFPH men sought to recruit disabled soldiers and union workers and create a new masculinized perception of disability – a special class of citizenship for men disabled in some type of service to the country.¹⁵

Jennings looks more specifically at that special class of citizenship in her essay “‘An Emblem of Distinction’: The Politics of Disability Entitlement, 1940-1950.” She states that laws such as the Vocational Rehabilitation Act of 1943 and the Servicemen’s Readjustment Act of 1944, commonly known as the G.I. Bill, defined a “new category of entitlement represent[ing] a dramatic expansion of the state and the entitlements connected to military service”;¹⁶ further, Jennings uses the federal government’s postwar prosthetic programs as a lens to analyze the new special class of citizenry. In 1942 and 1943, disabled veterans and veterans’ organizations worked to persuade the U.S. Congress against legislation that would incorporate veterans’ healthcare and civilian healthcare under the same bureaucratic umbrella. Veterans argued that Congress’s bill combined the “special rights” they had earned through their “service and sacrifice” with

¹⁴ Audra Jennings, “Engendering and Regendering Disability: Gender and Disability Activism in Postwar America,” in *Disability Histories*, eds. Susan Burch and Michael Rembis (Urbana: University of Illinois Press, 2014), 351.

¹⁵ *Ibid.*, 345-363.

¹⁶ Audra Jennings, “‘An Emblem of Distinction’: The Politics of Disability Entitlement, 1940-1950,” in *Veterans’ Policies, Veterans’ Politics: New Perspectives on Veterans in the Modern United States*, ed. Stephen R. Ortiz (Gainesville: University Press of Florida, 2012): 95.

the happenstance disability that occurred in the civilian population.¹⁷ The effects of veterans' successful campaigns to elevate the status of their citizenship over the claims of disabled civilians persist even to the present.

In addition to a sharpening of concepts of citizenship in the postwar period, the country also reveled in its technological superiority that characterized the atomic age. The analysis of prosthetics as material objects provides an effective lens through which to understand disability and the treatment of disabled people, particularly veterans. David Serlin discussed the material advancements made during World War II that contributed to new developments in the connection between body and technology in his book, *Replaceable You: Engineering the Body in Postwar America*. Each chapter charts how physical rehabilitation became “an allegory of national rehabilitation and the capacity for medical procedures to make such rehabilitation not only visible but also literal on the human body.”¹⁸ Each of the four chapters focuses on one of four distinct issues, ranging from plastic surgery to hormone replacement therapy to sexual reassignment surgery. Serlin's first chapter about the significance of prosthetic limbs in the context of “normative models of masculinity” following World War II is the most relevant in terms of my research. Serlin described the improvements in prosthetic design and construction as well as the relation to reconstruction and rehabilitation of amputee veterans' bodies for reintegration into the workforce. Many able-bodied Americans – including doctors, psychiatrists, and the general public – viewed amputees as dependent, emasculated, and incompetent. Amputees represented a challenge to the postwar American ideals of a

¹⁷ Ibid., 96.

¹⁸ David Serlin, *Replaceable You: Engineering the Body in Postwar America* (Chicago: University of Chicago Press, 2004), 2.

heteronormative family unit, with the husband and father as the protector and breadwinner and the wife and mother as the homemaker and caretaker. New prosthetic technologies brought on by the recent war – such as acrylic, polyurethane, stainless steel, silicone, titanium, and plastics – helped amputees “erase” their disabilities and reassert their masculinity. Cold War propaganda frequently included imagery of disabled veterans’ bodies in an attempt to influence public opinion to that of heroism and patriotism and inspire the non-disabled population to remember, honor, and employ those who had sacrificed their physical and emotional wellbeing in the service of their country.¹⁹

Katherine Ott also stresses the relationship between the body and technology in her *Disability Histories* essay, “Disability Things: Material Culture and American Disability History, 1700-2010.” Ott states that, for historians, “one of the most difficult modalities of people’s lives to retrieve from the past is how bodies move.” Material objects, such as prosthetics, convey information instrumental in preserving the history of disability, especially since historians and other leaders of the past frequently disregarded the written and spoken stories of disabled people. Furthermore, Ott argued that disability and technology are uniquely bonded as a “medium of social interaction.”²⁰ For example, in order to navigate so-called “normal” social functions, disabled people may require the assistance of some type of technology, such as wheelchairs, hearing aids, or prosthetic limbs. Accessibility to and possession of these objects (or lack thereof) determine a disabled person’s “competency” to perform those social activities.

The functions required to engage in social activities and display “normality” to

¹⁹ Serlin, *Replaceable You*.

²⁰ Katherine Ott, “Disability Things: Material Culture and American Disability History, 1700-2010,” in *Disability Histories*, eds. Susan Burch and Michael Rembis (Urbana: University of Illinois Press, 2014): 120.

society at large varied over time and fluctuated widely depending on contemporary social mores and attitudes. In *The Heart of Whiteness: Normal Sexuality and Race in America, 1880-1940*, Julian B. Carter describes the rise and total dominance of whiteness as a “default” in American culture; I argue that this idea relates to the similar dominance of able-bodiedness. For example, Carter describes two material representations of the ideal – Norma and Norm-man – as “‘normal’ American[s]...a particular kind of person [who] came to be perceived as uniquely modern, uniquely qualified for citizenship, *uniquely natural and healthy*.”²¹ There was a societal expectation that Americans would strive to meet this (admittedly unachievable) ideal. This was not always the case. Prior to 1880, disabled people interacted with able-bodied communities and environments in a variety of ways. In *A Disability History of the United States*, Kim E. Nielsen states, “the determination of ‘able-bodied’ [from 1492-1700] depended largely on the perception that one conformed to communal expectations regarding class, gender, race, and religion.”²² Physical disabilities did not concern as many early Americans as did mental disabilities. Those with the former could often contribute to their communities in some fashion, such as planting fields, spinning and weaving, or caring for children. Those with the latter frequently required community and legislative action for their care and treatment. Beginning in the early 1800s, however, the definition of disability became more structured and eventually codified as the inability to “procure a subsistence by manual labor.”²³ This definition has persisted throughout the nineteenth, twentieth, and twenty-

²¹ Julian B. Carter, *The Heart of Whiteness: Normal Sexuality and Race in America, 1880-1940* (Durham: Duke University Press, 2007), 2. Emphasis added.

²² Kim E. Nielsen, *A Disability History of the United States* (Boston, MA: Beacon Press, 2012), 12.

²³ An Act to Provide for Persons Who were Disabled by Known Wounds Received in the Revolutionary War, Chapter XXV, 9th Congress, 1st sess. (April 10, 1806).

first centuries.

The current literature reviewed provides insight into the three main themes of this research: the interaction of technology and the body; personhood and citizenship; and “normality” and social life. My goal for this research is to illustrate these themes primarily through the scope of prosthetic manufacturer Northrop Aircraft, Inc. and project participant (and civilian amputee) Jerry D. Leavy.

Background

The U.S. government’s work to provide its veterans with prosthetic limbs has evolved dramatically in the last 150 years. In her essay in *Materializing the Military*, “Carnage Remembered: Prosthetics in the U.S. Military Since the 1860s,” Katherine Ott argues that “the history of prostheses in the military proceeds in parallel with changes in both the destructiveness of military technology and in the treatment of the wounds it inflicts.”²⁴ As ammunition changed from minie balls to machine guns to grenade launchers, so too did the medical professional advance from simple anesthesia to more complex surgeries, such as cineplastic amputations.²⁵

The Civil War is the starting point from which many historians begin their review of government-provided artificial limbs, and with good reason. It remains the bloodiest and deadliest conflict in American history, with an estimated 45,000 surviving amputees

²⁴ Katherine Ott, “Carnage Remembered: Prosthetics in the US Military since the 1860s,” in *Materializing the Military*, eds. Bernard Finn and Barton C. Hacker (London: Science Museum, 2005): 48.

²⁵ According to Dictionary.com, a “cineplastic amputation” is the “surgical removal of an extremity in which the muscles and tendons in the stump are arranged so that they can perform independent movements and communicate motion to a specially constructed prosthetic apparatus.”

and 620,000 deaths.²⁶ Both the United States and the former Confederacy pursued different avenues in reconstructing the bodies of their wounded veterans. The former – which will be discussed in greater detail here – relied on the federal government to supply prostheses. However, the latter, which did not completely reunify with the United States until Georgia’s readmission as a state in the summer of 1870, relied on private relief agencies, charities, and state governments.

The U.S. Congress began addressing the reconstruction of Civil War veterans’ bodies in July 1862 with the Great Civil War Benefaction, a \$15,000 appropriation “for the purchase of artificial limbs for soldiers and seaman disabled in the service of the United States, to be expended under the direction of the Surgeon-General.”²⁷ Just two months later, U.S. Surgeon General William A. Hammond convened a panel of physicians to review and decide which northern prosthetic manufacturers would best suit the government’s needs for the allotted cost of \$50 per leg; the panel selected five manufacturers in 1862 and added three more in 1865.²⁸

Congress enacted its first prosthetics distribution law in June 1870. “An Act to Provide for Furnishing Artificial Limbs to Disabled Soldiers” stated that, after the law passed, disabled Union soldiers were entitled to a new artificial limb and a replacement

²⁶ “Civil War Casualties - The Cost of War: Killed, Wounded, Captured, and Missing,” *Civil War Trust*, accessed March 9, 2015, civilwar.org/education/civil-war-casualties.html.

²⁷ Chapter CLXXXII, approved July 16, 1862, §6; Compilation of Laws, Decisions, and Instructions Dated 1862 to 1892 Pertaining to the Settlement Claims for Prosthetic Appliances and Commutations; Preliminary inventory of Records of the Veterans Administration Pertaining to the Issuance of Artificial Limbs, Trusses, and Other Prosthetic Appliances, 1862-1935; Records of the Veterans Administration, Record Group 15; National Archives Building, Washington D.C.

²⁸ Guy R. Hasegawa, *Mending Broken Soldiers: The Union and Confederate Programs to Supply Artificial Limbs* (Carbondale: Southern Illinois University Press, 2012). The manufacturers added in 1862 included B. Frank Palmer, Douglas Bly, E. D. Hudson, Benjamin W. Jewett, and William Selpho. Those added in 1865 included A. A. Marks, George B. Jewett, and Richard Clement.

limb every five years thereafter. Further, it offered amputees the choice of commutation, or monetary compensation in place of an artificial limb; the Act stipulated \$75 per leg, \$50 per arm, and \$50 per foot.²⁹ Unfortunately, applicants and their agents did not always have a clear idea of the law's particulars. A sampling of surgeon general records from the mid-1880s demonstrated the problems still facing the federal government and its veterans over a decade after the law's passage. Responses sent from the surgeon general's office to veterans, manufactures, and congressional representatives can be used to infer the general nature of the claimants' original requests. Most of the responses reflected requests for additional information, approvals for limb manufacturing bonds, and denials of claims.³⁰

The government operated on a strict budget, and artificial limb manufacturers were, first and foremost, businessmen. Although their assistance to veterans made them appear benevolent at times, they often increased their bottom lines by overcharging or creating limbs of subpar materials for the very amputees they were allegedly helping. Poorly-made or -maintained limbs prompted veterans to request replacements sooner than expected. The government claimed an intent to provide "good and serviceable limbs;"³¹ however, it informed veterans that "[m]akers of artificial limbs [were] not required to

²⁹ An Act to Provide for Furnishing Artificial Limbs to Disabled Soldiers, Chapter CXXXIL, 41st Congress, 2d sess. (June 17, 1870).

³⁰ Letters Sent Relating to Prosthetic Appliances, Commutation, and Transportation Reimbursement, Sept. 1885-Feb. 1892; Preliminary inventory of Records of the Veterans Administration Pertaining to the Issuance of Artificial Limbs, Trusses, and Other Prosthetic Appliances, 1862-1935; Records of the Veterans Administration, Record Group 15; National Archives Building, Washington D.C.

³¹ Letter from Samuel Ramsey, Chief Clerk Surgeon General's Office to H. L. Thompson, Kansas, December 8, 1885; Letters Sent Relating to Prosthetic Appliances, Commutation, and Transportation Reimbursement, Sept. 1885-Feb. 1892; Preliminary inventory of Records of the Veterans Administration Pertaining to the Issuance of Artificial Limbs, Trusses, and Other Prosthetic Appliances, 1862-1935; Records of the Veterans Administration, Record Group 15; National Archives Building, Washington D.C.

keep them in repair, otherwise than to make good original defects.”³² An 1891 law eventually changed the interval to receive artificial limbs from five years to three,³³ but delays and poor craftsmanship persisted.

Little advancement occurred in the way of prosthetic design during World War I, although substitutions were sometimes required for materials imported from Germany. The most significant development following World War I was the government’s establishment of rehabilitation as a method to reconstruct certain bodies. In 1914, Congress passed the first iteration of War Risk Insurance by establishing the War Risk Insurance Bureau. The law charged the Bureau with providing insurance to American vessels and their cargoes “against loss or damage by the risks of war.”³⁴ The amended War Risk Insurance Act of 1917, however, redefined the way in which the federal government viewed soldiers’ bodies. The law essentially equated American soldiers with other valuable property by insuring against the soldiers’ “loss or damage” – that is, their death or disability.³⁵

³² “ Letter from Samuel Ramsey, Chief Clerk Surgeon General’s Office to Stephen M. Shirley, Defiance, Ohio, November 15, 1885; Letters Sent Relating to Prosthetic Appliances, Commutation, and Transportation Reimbursement, Sept. 1885-Feb. 1892; Preliminary inventory of Records of the Veterans Administration Pertaining to the Issuance of Artificial Limbs, Trusses, and Other Prosthetic Appliances, 1862-1935; Records of the Veterans Administration, Record Group 15; National Archives Building, Washington D.C.

³³ An Act to Amend Section Forty-Seven Hundred and Eighty-Seven of the Revised Statutes of the United States, Chapter 562, approved March 3, 1891; Compilation of Laws, Decisions, and Instructions Dated 1862 to 1892 Pertaining to the Settlement Claims for Prosthetic Appliances and Commutations; Preliminary inventory of Records of the Veterans Administration Pertaining to the Issuance of Artificial Limbs, Trusses, and Other Prosthetic Appliances, 1862-1935; Records of the Veterans Administration, Record Group 15; National Archives Building, Washington D.C.

³⁴ An Act to Authorize the Establishment of a Bureau of War Risk Insurance in the Treasury Department, Chapter 293, 63rd Congress, 2d sess. (September 2, 1914).

³⁵ An Act to Amend an Act entitled "An Act to Authorize the Establishment of a Bureau of War Risk Insurance in the Treasury Department," Approved September Second, Nineteen Hundred and Fourteen, and for Other Purposes, Chapter 105, 65th Congress, 1st sess. (October 6, 1917), §300.

In 1918, as Paul H. Douglas argues, World War I had created two types of non-insurability: private companies raised rates or refused to issue policies to high risk individuals, such as soldiers; additionally, healthy men came back from the war “in such impaired condition that private companies [would] not insure them.”³⁶ Therefore, the government took on the responsibility of insuring its military personnel at little to no cost. The Office of the Surgeon General encapsulated the general attitudes about disability and government responsibility in the first issue of its publication, appearing in 1918, *Carry On: A Magazine on the Reconstruction of Disabled Soldiers and Sailors*:

The Medical Department of the Army will “CARRY ON” in the medical and training treatment of the disabled soldier until he is cured or as nearly cured as his disabilities permit. We shall try to do our part in his restoration to health efficiently, with the belief that the wounded and sick soldier shall have the opportunity to return to civil life capable of pursuing a career of usefulness. This will enable him to enjoy the freedom and happiness afforded by world wide democracy for which he has given all.³⁷

The curative language in this excerpt reflects the prominence of the medical model during this period. Additionally, the language of “restoration” and “usefulness” refers to the importance of veterans’ rehabilitation – both physical and vocational – following World War I and codified through the Smith-Hughes Act in 1917.³⁸

In 1921, the Smith-Fess Act extended similar rehabilitation services to civilians with disabilities.³⁹ Increasing industrialization and the advent of Workmen’s

³⁶ Paul H. Douglas, “The War Risk Insurance Act,” *Journal of Political Economy* 26, no. 5 (May 5, 1918): 477.

³⁷ “Dedication by Surgeon General W. C. Gorgas,” *Carry On: A Magazine on the Reconstruction of Disabled Soldiers and Sailors* 1, no. 1 (June 1918): 3.

³⁸ Smith-Hughes National Vocational Education Act of 1917, Public Law 347, 64th Cong., 2d sess., February 23, 1917.

³⁹ Scotch, Richard K. “Smith-Fess Act.” In Burch, Susan, ed. *Encyclopedia of American Disability History*. New York: Facts On File, Inc., 2009. *American History Online*. Facts On File, Inc. fofweb.com/activelink2.asp?ItemID=WE52&iPin=EADH0645&SingleRecord=True (accessed July 26, 2015).

Compensation laws created an atmosphere in which wage work – and the ability to continue that wage work – predominately defined white male citizenship. Disabilities needed to be “cured” so these men could retain their superiority and independence through their earning power. Civilians continued to benefit from projects and legislation passed in the years immediately following a war, as will be described in greater detail in the following chapters. In the interwar years, the American economy took a dramatic downturn during the Great Depression. Franklin Delano Roosevelt (FDR) – himself disabled by polio in 1921 at the age of 39 – was elected president in 1932. Roosevelt’s New Deal set expectations regarding the types of programs and benefits the public could claim from the federal government. The beginnings of an American welfare system were evident in the establishment of Workmen’s Compensation and Mother’s Aid in the early twentieth century. However, as Barbara J. Nelson states in her essay “The Gender, Race, and Class Origins of Early Welfare Policy and the Welfare State: A Comparison of Workmen’s Compensation and Mothers’ Aid,” many historians agree that “the relatively late emergence of the welfare state in the United States (during the New Deal) is due to an earlier distrust of corrupt parties as the administrators of benefit programs and the lack of an alternative, neutral bureaucracy to undertake this task.”⁴⁰ The New Deal era ended this mistrust and placed the federal government in charge of this burgeoning welfare state.

Some of the most important New Deal legislation included the establishment of an agricultural domestic allotment, the Civilian Conservation Corps (CCC), the Federal

⁴⁰ Barbara J. Nelson, “The Gender, Race, and Class Origins of Early Welfare Policy and the Welfare State: A Comparison of Workmen’s Compensation and Mothers’ Aid,” in *Women, Politics, and Change* (New York: Russell Sage Foundation, 1990), 413–35.

Emergency Relief Administration (FERA), the Tennessee Valley Authority (TVA), and the National Industrial Recovery Act (NIRA). NIRA established federal regulations for minimum wages and maximum hours. Additionally, it created the National Recovery Association (NRA) and the Public Works Administration (PWA). These programs provided employment opportunities and some economic security to Americans who were still reeling from the Depression. However, as David M. Kennedy states in *Freedom from Fear: The American People in Depression and War, 1929-1945*, “despite the New Deal’s exertions and innovations, and contrary to much later mythology, in no subsequent year in the 1930s would the unemployment rate fall below 14 percent.”⁴¹ FERA was charged with distributing relief funds to the American public, matching one federal dollar to every three state dollars. Not only did FERA face bureaucratic red tape and corruption, but the application process for those seeking relief was intrusive and frequently humiliating. The simple act of showing up to receive relief shamed a man (and it was usually a man) as unable to provide for himself and his family. Additionally, he had to provide detailed information about his financial status, health, and family. Although the medical model was gaining more prominence in the 1930s, many Americans – including the unemployed and destitute themselves – still viewed their misfortunes under the guise of the moral model. They believed their “hard luck” was the result of moral personal failings, despite a mountain of evidence to the contrary.⁴²

New Deal programs systematically excluded one group from its benefits: disabled people. The Work Projects Administration, as well as other relief organizations, classified

⁴¹ David M. Kennedy, *Freedom from Fear: The American People in Depression and War, 1929-1945* (New York: Oxford University Press, 1999), 166.

⁴² *Ibid.*, 160-189.

people with disabilities as “unemployable,” regardless of any previous work, vocational, or education experiences they possessed.⁴³ Even as the state attempted to increase the economic citizenship of non-disabled Americans by putting them back to work, it devalued or outright denied the citizenship of disabled Americans by refusing them the same opportunities. The Social Security Act of 1935 established some economic security for groups such as children, elderly people, blind people, and disabled people through three types of “assistance” or “welfare” programs. The Act “broadened public health services for everyone in the nation, made vocational rehabilitation services permanent, and increased child welfare services for a wide spectrum of families from all socioeconomic classes.”⁴⁴ These legislative developments kept many disabled people above – although sometimes very near – the poverty line.

This thesis demonstrates how the American view of disability changed, particularly focusing on the combined efforts of the government and private sectors to reconstruct disabled bodies from 1945 to 1953. In order to trace the development of post-World War II prosthetic limbs, I include sources from the Civil War and World War I as well. The National Museum of Health and Medicine (NMHM) in Silver Spring, Maryland, houses many patent models and prosthetics from the nineteenth and twentieth centuries. Additionally, because the federal government became involved in providing veterans with artificial limbs as early as 1862, the National Archives and Records Administration (NARA) in Washington, D.C., contains many records related to surgeon general correspondence, fraud claims, and artificial limb manufacturers registries.

⁴³ Nielsen, *A Disability History of the United States*, 135.

⁴⁴ Wilbur J. Cohen, “The New Deal and Its Legacy: The Development of the Social Security Act of 1935: Reflection Some Fifty Years Later,” *Minnesota Law Review* 68, no. 2 (December 1983): 379.

Following World War I, rehabilitation became a primary goal for doctors, disability advocates, and many people with disabilities. Federal legislation and news stories of the day provide insight into the changing attitudes and ideas about disabled people and their place in society. Finally, for World War II – that is, the bulk of my research – I depend upon government contracts and documents held at the NARA facility in College Park, Maryland, and National Research Council reports, company records, and personal recollections – much of which was completed during and as a part of my internship at the National Museum of American History (NMAH) in Washington, D.C. in the summer of 2014. In closing, the following chapters are arranged thematically.

Chapter Two describes the efforts made by businesses such as Northrop Aircraft, Inc., the federal government, and other interested parties to provide the best possible prosthetic devices for the newly re-masculinized and re-constructed bodies of veterans and some civilians. Chapter Three examines personhood and citizenship as it relates to Northrop and its program participants. Chapter Four discusses the portrayal of amputees through training films and other movies that served to reinforce the dominant white, middle-class, heterosexual status quo in the process of reintegrating amputees back into “normal” society. Overall, businesses, the government, and the American public wanted to achieve a sense of normalcy following World War II. For many amputees, prosthetics helped them move toward that goal, both literally and figuratively.

CHAPTER 2

Postwar Prosthetics and Governmental and Corporate Cooperation

As World War II drew to a close, the federal government faced a looming crisis of disease and disability on a larger scale than it had after previous wars. The war had created unprecedented numbers of amputees who had to contend with uncomfortable, inferior, unavailable, and expensive prostheses. To address this problem, the United States Surgeon General established the Committee on Prosthetic Devices in 1945, which awarded its first contract to Northrop Aircraft, Incorporated, a company that was well positioned to address the problem by developing cheaper, lighter, and more durable prostheses because a) it had secured government contracts before; b) it had the research facilities – or access to such facilities – to conduct the necessary cutting-edge research; and c) it had the leadership and will to do so. Americans struggled to conceive of how and to what extent the government should be responsible for reconstructing and rehabilitating its citizens' bodies. This chapter describes the efforts made by businesses such as Northrop Aircraft, Inc., the federal government, and other interested parties to provide the best possible prosthetic devices for the newly re-masculinized and re-constructed bodies of veterans and some civilians.

According to the National Research Council's Terminal Research Report on Artificial Limbs covering 1945 to 1947, approximately 20,500 military personnel sustained service-connected injuries requiring amputation during World War II. Additionally, "some 65,000 civilians in war industries sustained injuries resulting in amputations, and the annual rate at which new amputees [were] added to the existing

number [was] estimated at 40,000.”⁴⁵ Some estimates state for every one disability on the battlefield, eight occurred in industry. Further, the report predicted the total number of amputees – both military and civilian, and many of whom needed artificial limbs – to reach 500,000.⁴⁶ Therefore, development and improvement of prosthetics appealed to a significant number of the American population.

Progress was slow in the creation and improvement of prosthetics, however. Civil War-era artificial limbs consisted of wood, metal, leather, and glass. The early twentieth century and World War I years saw the invention and use of vulcanized rubber, synthetic resins, and plastics. What made World War II’s prosthetic limbs unique, as David Serlin argues, was that they “represented the marriage of prosthetic design to military-industrial production.”⁴⁷ Materials such as “Plexiglas, Lucite, polyester, silicone, titanium, Duralumin, stainless steel, ceramics, and high-grade plastics flooded the industrial and consumer markets.”⁴⁸ However, despite these material improvements, in a September 1945 Congressional subcommittee hearing, Captain Frank P. Kreuz of the United States Navy outlined six major problems facing the post-World War II prosthetics field: appearance, utility, weight, durability, noise, and texture.⁴⁹

⁴⁵ Committee on Artificial Limbs of the National Research Council, *Terminal Research Reports on Artificial Limbs, Covering the Period April 1, 1945 through June 30, 1947*, Washington, D.C., 7.

⁴⁶ “The Human Machinery of War: Disability on the Front Lines and the Factory Floor, 1941-1945,” *Ohio State University Department of History*, accessed November 14, 2015, ehistory.osu.edu/exhibitions/machinery/index.

⁴⁷ Serlin, *Replaceable You*, 36.

⁴⁸ *Ibid.*, 36–37.

⁴⁹ Statement of Capt. Frank P. Kreuz, Medical Corps, Bureau of Medicine and Surgery, United States Navy, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 11, 1945, 1586-1595.

Appearance presented more of a problem for upper extremity amputees than lower extremity amputees; prosthetic legs and feet could be more easily hidden under pants legs and shoes than could prosthetic arms and hands be hidden under shirts. Amputees requiring prosthetic arms could typically choose from split-hook or cosmetic hands (see Figures 2.1 and 2.2, respectively). Noise and texture had improved considerably since the Civil War and World War I with their clunky wooden legs and unrealistic materials, but still needed improvements.

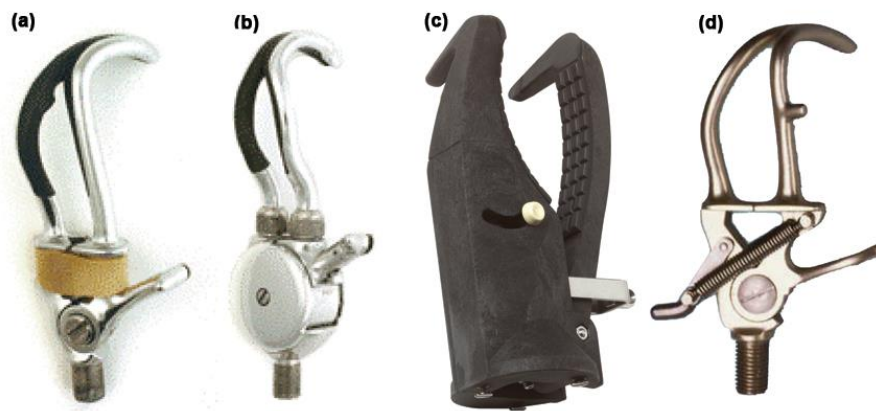


Figure 2.1: Examples of Split-Hook Hands to the Present⁵⁰

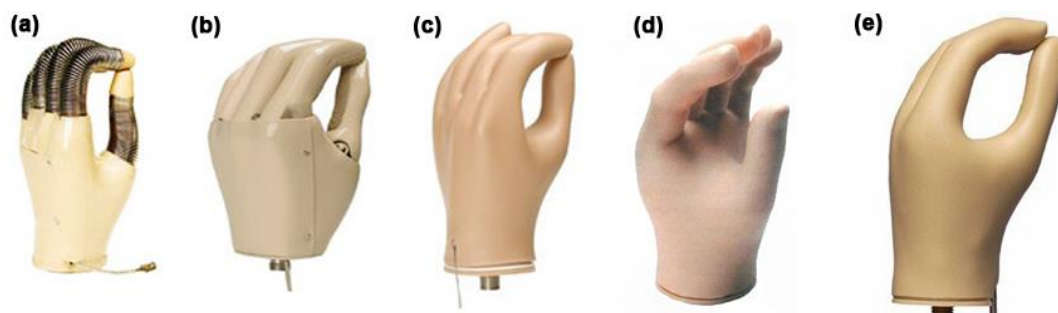


Figure 2.2: Examples of Cosmetic Hands to the Present⁵¹

⁵⁰ Gerwin Smit et al., “Efficiency of Voluntary Opening Hand and Hook Prosthetic Devices: 24 Years of Development?,” *Journal of Rehabilitation Research and Development* 49, no. 4 (2012): 523–34.

⁵¹ Ibid.

By far the most challenging issues – and the ones amputees complained most about – included utility, weight, and durability. Kreuz outlined each of these issues in his testimony. Regarding utility, he explained, no prosthetic limb could truly replace the “normal extremity;” however, “with proper training, the average individual can be taught to use an artificial limb to a point where he is able to perform the tasks required for a normal life.”⁵² Amputees who testified at the subcommittee hearing provided important insight into utility issues plaguing prosthetic limb users. One topic was comfort; after all, an amputee could not receive the full benefit of the limb if it was not comfortable to use. Some amputees experienced problems with fit or chafing and opted to create their own functional ideas and plans to improve prosthetic limbs. For example, James N. Ice, an amputee and employee of the Riverside Steel Company, demonstrated the use of a prototype device to reduce the strain placed on the shoulders through use of prosthetic leg straps, making his limb easier to use. In September of 1945, he explained:

This [device] helps to keep the straps from chafing in the hot weather. I used to have to sit down with my straps tight and they would be uncomfortable. At times I could hardly sit in an automobile. Now, I can sit down any place.⁵³

His choice to use an automobile as an illustration of the limitations of previous devices indicated the increasing pervasiveness of automobiles as a status symbol in the United States. One’s inability to drive a car – or even ride in one – had the potential to severely

⁵² Kreuz, *Hearings before the Committee on Labor*, September 11, 1945.

⁵³ Statements of Alexander Best, President, Riverside Steel Co., Wheeling, W. VA., and James N. Ice, an Employee of Riverside Steel Co., Wheeling, W. VA., *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 19, 1945, 1663-1667.

stunt reintegration into society by making activities generally perceived as “normal” less accessible. With the assistance of his employer Andrew Best, Ice planned to patent his design, present it to the Walter Reed Army Medical Center, and manufacture it through Riverside Steel’s factories so it could be made widely available.

Other amputees expressed concern regarding the unrealistic expectations set for prosthetic limb use. Doctors and limb manufacturers often informed amputees they would be able to perform routine tasks – such as eat, get dressed, walk, and dance – just as well with prosthetic limbs as with the “natural” limbs. Nathan D. Golden, however, disagreed. An amputee and Chief of Department of Commerce’s Motion Picture Unit, Golden described the issue:

I think it is somewhat poor publicity, creating the idea that a man with a leg off is capable of doing things that one can do with his two natural legs. I think it may be laying a lot of veterans open to disappointment, because as they get older they will not have the energy to do the things they are being taught to do with artificial limb now.⁵⁴

He further explained that the condition in which the limb was used also affected its use. For example, strong winds, ice, rocks, or even bits of dirt could dramatically change the way the amputee interacted with a walking or handling surface. Veteran Joseph Zeglin described problems he had with his split hook: “There is not very much you can do with it. All you can do is push or hold something.”⁵⁵ Clearly, many amputees believed their

⁵⁴ Statement of Nathan D. Golden, Washington, D.C., *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 20, 1945, 1692-1695.

⁵⁵ Statement of Joseph Zeglin, a Veteran, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., October 12, 1945, 1748-1753.

prosthetics did not meet even their most basic expectations.

Amputees' attempts to maintain economic security were often thwarted by subpar prosthetics. John W. Meakins, an employee of the Rustless Iron & Steel Company in Maryland related his predicament:

[The Army says] that when I get out I would get another leg in 6 months. And I went to work and I couldn't do the job, the job I had. They gave me an easier job, and I rub blisters on the side standing up working, and I would lose time from work there: be there 4 weeks, work at about 2 weeks, and was off 1 week because I could not walk around without crutches. I went back to work again, and they gave me an easier job and I cannot do that. I got to go back again. I have to wait.⁵⁶

Like Meakins, many amputees wanted to reenter the workforce and expected their prosthetic limbs to help them achieve that goal; unfortunately, delays and poor fitting often interfered with an amputees' ability to maintain work or adequately perform tasks. As will be discussed in further detail below regarding Northrop's "Department 99" project, educating and training amputee veterans to successfully re-enter the workforce was a top priority for Americans following the end of World War II.

In his testimony before the congressional subcommittee, Captain Kreuz also described problems regarding the weight of prosthetics. The challenge for engineers and manufacturers was to make a limb an amputee could easily lift and use while maintaining its ability to "withstand the stresses, strains and torques to which it is subjected in ordinary wear" as well as "abnormal or accidental forces."⁵⁷ Additionally, although many amputees thought differently, Kreuz believed weight was not as important as other issues.

⁵⁶ Statement of John W. Meakins, Baltimore, MD., an Employee of the Rustless Iron & Steel Co., *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 25, 1945, 1715-1717.

⁵⁷ Kreuz, *Hearings before the Committee on Labor*, September 11, 1945.

He argued, “It is better to concentrate on the development of the remaining muscles and of the entire body, so as to make an additional small amount of weight unimportant.”⁵⁸

Lieutenant Howard Morse encountered problems with both of these issues. He had an above elbow stump that extended approximately two inches from his shoulder.⁵⁹ When doctors performed the amputation, they placed his remaining arm in a cast for six weeks at a 45° angle with very little motion. So, although he participated in daily physiotherapy for four months to build the muscles in his back for operation of his prosthetic arm, he could never attain the full range of motion. Morse described the condition of his arm and muscles:

If the prosthesis were made half as light, I might have sufficient power [to operate it]. That is something I do not know until I get a prosthesis that will weigh half as much as this one. I think if I had a lighter one, I might be able to do it. As it stands now, the prosthesis I have merely dangles down on my side. When I sit down, I put it in my pocket. I do not need my left hand now.⁶⁰

Unfortunately for Morse, manufacturers did not allow him to try on or test prosthetic limbs before he bought them. Much of this was due to the fact that limbs had to be specially fit for each amputee’s stump. Therefore, as he informed the subcommittee, it was entirely likely that amputees could spend hundreds of dollars multiple times and still not receive a limb with satisfactory fit or optimal weight. Attorney William H. Jacobs

⁵⁸ Kreuz, *Hearings before the Committee on Labor*, September 11, 1945.

⁵⁹ Current terminology favors the use of “residual limb” over that of “stump.” However, many of my sources date from the 1940s-1950s at which time “stump” was the commonly used term. Therefore, for the sake of consistency and context, I have opted to use the earlier terminology.

⁶⁰ Statement of Lt. Irving Krieger, United States Army, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 13, 1945, 1658-1663. Although this is the statement of Lt. Krieger, Lt. Howard Morse interjected a few sentences throughout Krieger’s testimony.

encountered similar issues with his prosthetic leg. His leg stump was approximately four-and-one-half inches, two-and-one-half which he could use to control the socket and leg. However, the leg he used at the time of his subcommittee testimony weighed six pounds, not including the belt used for control or his shoes. As Jacobs explained, “in order to accomplish a weight of 6 pounds, I, myself, drilled approximately 2,000 holes in the leg. By doing so I gained approximately 6 ounces of weight lost [which was] one of the biggest improvements that I have ever had.”⁶¹ For Jacobs, the risk of a stiff wind picking up and carrying his leg was a risk he was willing to take if it meant obtaining a lighter – and more useful – leg.

Finally, Kreuz outlined the issue of durability in prosthetic limbs. Durability depended, in large part, on the construction of the limb; however, he also stated it depended on the “use to which the artificial limb is subjected.”⁶² He encouraged amputees to use the same care as with “any other mechanical device, such as one’s car, or watch, or gun;”⁶³ this statement provides not just an insight into the care required to maintain durability, but also the perceptions of prosthetic limbs as mechanical and, to a large degree, inhuman. In the subcommittee hearings, lack of durability was often attributed to subpar materials and construction. To begin with, most prosthetic limbs included movable parts and sometimes required assembly of multiple pieces. Although this made for more efficient manufacturing, these movable parts increased the likelihood

⁶¹ Statement of William H. Jacobs, Attorney, Department of Justice, Washington, D.C., *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 20, 1945, 1696-1702.

⁶² Kreuz, *Hearings before the Committee on Labor*, September 11, 1945

⁶³ *Ibid.*

of damage, malfunction, or other errors.

As for materials, amputees had their own views. Former soldier Robert L. Rogers believed wood was the toughest material available for those whose residual limbs could handle the weight. Aluminum, he said, was light, “although it does not stand up very well, needs repairing in about a year and is not easy to repair.”⁶⁴ However, veteran Irving Peltz contended wooden legs “do not hold up very well. They keep breaking down.”⁶⁵ Whatever their condition, it was clear newer and more durable materials were needed to meet the demand created by the military and industrial injuries of World War II.

On the military side, advancements in medicine and other technologies both contributed to and created obstacles in the treatment of injured soldiers and sailors. Major contributions included an increase in surgeons at the front, the use of penicillin and other new drugs, and the development of a blood bank system. The survival rate for amputees increased over that of the Civil War and World War I, and the government could not cope with the sheer quantity of disabled veterans and their demands for superior healthcare and rehabilitation services. One way in which the government tried to relieve the pressure on its overloaded system was to install amputation centers in established Army hospitals throughout the country. The government approved five centers in March 1943:

⁶⁴ Statement of Robert L. Rogers, Sparrows Point, MD., an Employee of the Bethlehem Steel Co., *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 25, 1945, 1709-1715.

⁶⁵ Statement of Irving Peltz, A Veteran, Brooklyn, NY, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., October 12, 1945, 1728-1732.

Washington, D.C.; Atlanta, Georgia; Battle Creek, Michigan; Temple, Texas; and Brigham City, Utah. Another two centers were opened in 1944 and 1945 in Atlantic City, New Jersey, and Richmond, Virginia, respectively. These centers aimed to provide key services to disabled veterans, such as physical and vocational rehabilitation, as well as training opportunities for surgeons and prosthetic technicians. Additionally, once a soldier or sailor had been discharged, the Veterans Administration (VA) handled prosthetic replacements and medical or surgical treatments.⁶⁶ More detail about the VA's involvement in prosthetic programs is discussed later in this chapter.

On the industrial side, civilian workers had to seek care without even the small protections provided to veterans by the VA. In fact, the medical director of the VA, Dr. Charles M. Griffith, testified that if a civilian “does not have a private doctor or an orthopedist to help him, God have mercy on him. If he accepts that sales talk [from limb manufacturers], that is his responsibility.”⁶⁷ This was his response to subcommittee chairman Augustine B. Kelley's inquiry about possible safeguards for civilian amputees when searching for a prosthetic limb. Kelley also expressed interest in the medical treatment and training of civilians to use their prosthetics. Based on the testimony of Lieutenant Sol Rael, Kelley surmised that “the civilian who needs an artificial leg, for instance, cannot get the same training as is provided in Army hospitals...unless they have

⁶⁶ Audra Jennings, "'An Emblem of Distinction': The Politics of Disability Entitlement, 1940-1950," in *Veterans' Policies, Veterans' Politics: New Perspectives on Veterans in the Modern United States*, ed. Stephen R. Ortiz (Gainesville: University Press of Florida, 2012): 94-116.

⁶⁷ Statement of Dr. Charles M. Griffith, Medical Director, Veterans' Administration, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 12, 1945, 1571-1573.

sufficient funds.”⁶⁸

Whether discussing veterans or civilians, however, most people agreed the field of prosthetics needed to advance. In 1945, Colonel Leonard T. Peterson, Chief of the Orthopedic Branch in the Office of the Surgeon General, stated the purpose of the 1943 prosthetics program was to “promote better quality, improved mechanical features, and standardization of limbs.” In June 1943, they defined a policy on the supply and fitting of prosthetics. They planned to create a standard limb that could be “obtained in sufficient quantity, readily fitted, and easily altered to meet the changing condition of the recent amputation stump.”⁶⁹ However, many of these standardized legs did not adequately adjust to the amputees’ healing limbs. Furthermore, the government had difficulty in obtaining sufficiently skilled workers to quickly manufacture the limbs, let alone improve upon the designs. The mass-produced, assembly-line construction of the prosthetic limbs allowed semi- or unskilled workers to supplement the industry’s distinct lack of skilled workers.⁷⁰

In November 1943, the Association of Limb Manufacturers of America (ALMA) incorporated a nonprofit branch – the Research Institute Foundation, Inc. – that focused on scientific research and development of prosthetic devices.⁷¹ Chester C. Hadden,

⁶⁸ Statement of Lt. Sol Rael, United States Army, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 129 1945, 1654-1656.

⁶⁹ Statement of Col. Leonard T. Peterson, Chief of Orthopedic Branch, Office of the Surgeon General, Army Medical Corps, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 11, 1945, 1571-1573.

⁷⁰ Jennings, ““An Emblem of Distinction.””

⁷¹ Peterson, *Hearings before the Committee on Labor*, September 11, 1945.

president of ALMA, refused federal funding for that research. Historian Audra Jennings argues that Hadden knew “admitting that there was indeed a problem [with the limbs ALMA’s members currently provided] at best would have implied that artificial limb makers did not have the resources to make sure their products were in touch with the times and at worst would have suggested that greed or ineptitude had prevented improvement.”⁷² Unfortunately, lack of funding and insufficient staff plagued these efforts and little progress was made among the privately funded industry group.⁷³

Disappointed by the prosthetic industry’s apparent standstill, Army Medical Corps officials took their own action and called a meeting with the National Research Council (NRC) in early 1945. By April 1945, the NRC established the Committee on Prosthetic Devices (CPD) through its Division of Medical Sciences and Division of Engineering and Industrial Research. Paul E. Klopsteg, Director of Research at Northwestern Technological Institute, served as the committee chair, and the remaining members consisted of three orthopedic surgeons (Harold R. Conn at Goodyear Tire and Rubber Company, Paul B. Magnuson at Northwestern University Medical School, and Philip D. Wilson at Columbia University Medical School) and three engineers (Robert R. McMath at McMath-Hulburt Observatory, Mieth Maeser at United Shoe Machinery Corporation, and Edmond M. Wagner of the National Defense Research Committee). The subcommittee of surgeons “consider[ed]’ orthopedic problems and ma[de] recommendations to the general Committee regarding the functional requirements of prostheses,” while the engineer subcommittee gave “consideration to matters of design,

⁷² Jennings, ““An Emblem of Distinction,”” 104.

⁷³ Peterson, *Hearings before the Committee on Labor*, September 11, 1945.

materials, fabrication, and other technical matters.”⁷⁴ They were joined by consultants Charles F. Kettering, Director of Research at General Motors Corporation and Roy D. McClure, Chief Surgeon at Henry Ford Hospital.⁷⁵ These men and their organizations each had specific knowledge and experiences that benefited the renewed demand for and production of prosthetic limbs.

The CPD aimed to establish a temporary program to assist governmental agencies in obtaining “the best prostheses now obtainable to meet the present emergency.”⁷⁶ Additionally, it intended to create a long-range program to initiate and sustain a research and development program devoted to providing the “best possible artificial legs and arms, particularly for those who have sustained loss of these members in war.”⁷⁷ Government reports indicated the developments in creating better prosthetics for veterans would also be “brought to the civilian amputee in the normal course of events.”⁷⁸ To accomplish their goals, the CPD outlined seven main procedures:

1. Collect and examine all existing prostheses.
2. Analyze the functioning artificial and “normal” legs.
3. Develop a program to improve, simplify, and standardize prosthetic design and construction.
4. Investigate suitable materials for prosthetic construction.
5. Find the best methods to secure prosthetics to amputee’s residual limbs.
6. Develop a method to simplify and standardize the proper fitting of limbs.

⁷⁴ Special Progress Report, August 15, 1945; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

⁷⁵ Ibid.

⁷⁶ Ibid.

⁷⁷ Ibid.

⁷⁸ Report of Hon. Augustine B. Kelley, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, 1945.

7. Train amputees effectively in the use of their prostheses.⁷⁹

In June 1945, CPD took a step toward reaching these goals by executing its first contract with Northrop Aircraft – a six-month, \$67,000 agreement requiring development of “various special phases of artificial limbs.”⁸⁰

Northrop Aircraft

John Knudsen (“Jack”) Northrop founded Northrop Aircraft in 1939, but his aviation work began in 1916 when he worked as a draftsman for the Loughhead Aircraft Company. He worked for the Douglas Aircraft Company from 1923 to 1927 and then returned to work with Allan Lockheed (Loughhead), where he designed the Lockheed Vega, flown by such notable aviators as Wiley Post and Amelia Earhart. Northrop founded his first aircraft company, Avion Corporation, in 1928, which he later sold to United Aircraft and Transport Corporation. In 1932, he created the Northrop Corporation as a subsidiary of Douglas. When Douglas absorbed that company in 1939, Northrop founded Northrop Aircraft, Incorporated, in Hawthorne, California. Present-day Northrop Grumman traces its history to Northrop Aircraft, Inc. Northrop began construction of a new manufacturing plant in September 1939 and, less than a year later, secured its first contract, a \$1,000,000 agreement to supply the Kingdom of Norway with twenty-four N3BP bombers. For most of World War II, however, Northrop manufactured aircraft for the United States, including the P-61 Black Widow night-fighter and the XB-35 flying

⁷⁹ National Research Council, *Terminal Research Report on Artificial Limbs, Covering the Period April 1, 1945 through June 30, 1947* (Washington, D.C.), 9–10.

⁸⁰ Bi-monthly Progress Report No. 2, July 15, 1945; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

wings, a precursor to today's B-2 stealth bomber.⁸¹

The advancements Northrop Aircraft made in the design and production of these planes prepared them for the type of technological ingenuity it would need to assist the government in supplying amputees with prosthetics. Early in 1944, Jack Northrop became interested in the rehabilitation work being carried out at the U.S. Army's Birmingham General Hospital in Van Nuys, California. He negotiated the employment of recovering veterans for his company in the summer of 1944. In August 1944, *Aero Digest* published an article about Northrop's vocational therapy program, also known as "Department 99," implemented at Birmingham General. The hospital created this department as a result of patient surveys indicating that many of the recuperating men wanted to learn a trade. According to the commanding officer of the hospital, Colonel Alvin C. Miller, the vocational therapy program had three goals: to "give patients useful work to stimulate their muscles and minds...educate them in a new and valuable vocation, and...allow them to contribute further to the war effort while convalescing."⁸² These activities contributed to the gendered social expectations placed on men, and veterans in particular. Veterans were simultaneously the epitome of masculinity (as evidenced by their military service) and a constant reminder of the emasculating results of that service (their presumed economic dependency).

Fears regarding the masculinity of returning soldiers began to be voiced even

⁸¹ Richard Witkin, "John Knudsen Northrop, Aviation Design Pioneer, Dies," *New York Times*, February 20, 1981; "Jack Northrop: A Visionary's Bittersweet Legacy," *Northrop Grumman*, accessed November 8, 2015, northropgrumman.com/AboutUs/OurHeritage/OurFounders/JackNorthrop/Pages/default.aspx; "Northrop to Open Airplane Factory for Battle Craft," *The Bakersfield Californian*, June 20, 1939.

⁸² "Northrop's Vocational Therapy Program," *Aero Digest* 46 (August 1944): 56.

before the war had ended. One of the most concerning was “what effect trauma and disability would have on veterans’ self-worth, especially in a competitive economy defined by able-bodied men.”⁸³ To add further complications, the war had shown that the industrial economy need not be defined strictly by able-bodied men. Hundreds of thousands of women joined the industrial workforce in the absence of its usual male employees. This called into question the previously accepted traditional gender roles of the woman as homemaker and the man as breadwinner. If a woman could also act as a breadwinner, a man’s accepted role could shift as well. These roles concerned not only returning veterans, but also employers, physicians, psychologists, government officials, and the American public in general. Despite Americans’ claims to treat veterans as heroes, these people often regarded veteran amputees as “physical proof of emasculation or general incompetence, or else a kind of monstrous defamiliarization of the normal male body” and treated them as “potentially troubled and socially maladjusted.”⁸⁴ It was these attitudes that veterans hoped to change through their participation in programs such as Department 99. Patients could reconstruct their bodies through rebuilding their muscles while also reasserting their masculinity through taking on the traditionally male gender role of breadwinner through wage work as soon as physically possible in the recovery process.

Northrop also promoted economic citizenship by employing these workers as trainees and paying them a salaried rate in addition to the pay they received from the military. Twenty-five percent of the patients expressed interest in learning machine operations; they did so primarily through assembling mechanical parts for the

⁸³ Serlin, *Replaceable You*, 24.

⁸⁴ *Ibid.*, 22–23.

aforementioned Black Widow. Birmingham General and Northrop facilitated this process by accommodating each patient's disability.⁸⁵ For example, machinery in the Northrop plant could be adapted for a specific amputee's use, including operating a drill press with a foot pedal, readjusting the heights of work tables, or configuring specially designed work trays for bed-ridden patients.⁸⁶ In addition to the physical adaptations provided, Northrop Aircraft tried to consider the mental wellbeing of their veteran employees. In a 1944 article, industrial physician Harold B. Dye described the issue:

In the case of veterans discharged because of a mental disorder, their placement in industrial plants immediately after discharge from a hospital does not give them sufficient time to make the necessary adjustments. In the less severe cases locating the men on farms, dairies, orchards, and other outside work, especially when past experience fits them for such vocations, is practicable and eliminates the exposure to the noise, confusion and pressure of the industrial plant.⁸⁷

This type of nonindustrial work allowed these veterans to maintain their masculinity by not depriving them of the opportunity to contribute to society economically or in some other meaningful way. Other popular trades among the patients included welding, radio repair, photography, agriculture, and carpentry.

As a result of Jack Northrop's interest in employing recovering veterans, he "soon became conversant with the need for improved devices for amputees."⁸⁸ On June 29, 1944, Northrop and his mechanical expert, Michael Nagy, visited Bushnell General Hospital in Brigham City, Utah, at the request of Lt. Col. John Loutzenheiser, an army

⁸⁵ "Northrop's Vocational Therapy Program," 57.

⁸⁶ "Wounded Busy on Plane Parts in Hospital," *Joplin News-Herald*, August 23, 1944.

⁸⁷ Harold B. Dye, "Veteran Placement as Viewed by an Industrial Physician," *The Journal of Industrial Health, Occupational Diseases, and Traumatic Surgery* 13, no. 12 (December 1944): 990.

⁸⁸ Gilbert M. Motis, *Contractor's Final Report on Artificial Arm and Leg Research and Development, Covering the Period January 2, 1945 to December 31, 1950* (Hawthorne, CA: Northrop Aircraft, Inc., 1951), a.

orthopedic specialist. Loutzenheiser believed appealing to aircraft manufacturers would work in his favor because “airplane mechanics invent gadgets that make them almost inhuman, and why not do the same for prosthetic appliances.”⁸⁹ He hoped to convince Northrop of the need to develop “efficient, lightweight mechanical devices” and engineer “light metal structures” for use in prosthetic limbs distributed to amputee veterans.⁹⁰ After examining the types of prostheses in use and interviewing the patients using them, Northrop and Nagy believed they could dramatically improve upon the available prosthetics. Indeed, they began designing improvements on their plane trip back to California. According to Northrop’s “History of Prosthetic Development” included in the Contractor’s Final Report, “the first experimental work carried to a successful conclusion was the development of a new, more efficient, and more durable control mechanism for the artificial hand or hook.”⁹¹ Prior to this, amputees operated their prostheses using rawhide or leather thongs, both of which lasted only a few days or weeks.

In June 1945, as stated above, the CPD executed its first contract with Northrop Aircraft, requiring development of “various special phases of artificial limbs,”⁹² a description that left much room for interpretation. Northrop constructed a separate facility in nearby Hawthorne, California, to work on these projects. Several amputees, including civilian Jerry D. Leavy (who will be discussed in later chapters), “were used continuously

⁸⁹ Statement of Charles McGonegal, National Field Secretary, American Legion, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 11, 1945, 1596-1605.

⁹⁰ Motis, *Contractor’s Final Report*, a.

⁹¹ *Ibid.*, b.

⁹² Bi-monthly Progress Report No. 2, July 15, 1945, OSRD.

to test the hundreds of devices developed during the life of the program.” This description frames amputees as objects – they were “used” – even as Northrop and the government worked to re-construct and make their disabled bodies “whole.”

The NRC ultimately extended Northrop’s contract until December 31, 1950. In their five years of participation, Northrop Aircraft made contributions in the prosthetics field through developments in x-ray motion pictures (cinefluorography) that monitored the movement of bones and joints;⁹³ above-elbow and below-elbow artificial arms; artificial hands; hook designs; artificial legs, including suction sockets, anatomical legs, hydraulically actuated knee lock, mechanically-actuated knee snubber, and mechanical knee lock; plastics, plaster, and cosmetic coverings; limb fitting techniques; harness studies; and force plates.⁹⁴

Other organizations involved in CPD’s activities included Goodyear Tire and Rubber Company, the Research Institute Foundation, the University of California, U.S. Plywood Corporation, International Business Machines Company (IBM), Northwestern University, National Research and Manufacturing Company, A.J. Hosmer Corporation, and C.C. Bradley and Sons.⁹⁵ Their contracts varied; some worked on one continuous project, while others, such as Northrop, took on and finished multiple projects. Goodyear worked on the development of a lighter foot made of rubber or a combination of rubber and metal with an ankle joint that would “permit lateral movement and produce a more

⁹³ Motis, *Contractor’s Final Report*, c.

⁹⁴ Committee on Artificial Limbs of the National Research Council, *Terminal Research Reports on Artificial Limbs, Covering the Period April 1, 1945 through June 30, 1947*, Washington, D.C., 20-32.

⁹⁵ Bi-monthly Progress Report No. 6, June 1, 1946; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

lifelike action.”⁹⁶ The Research Institute Foundation worked to “develop methods of fabricating hip and shoulder disarticulation sockets from molded plastic material.”⁹⁷ U.S. Plywood’s contract required “an exhaustive study of the suitability of plastic laminates for the construction of artificial limbs.”⁹⁸ IBM developed a prosthetic hand “combining the utility of the present metal hook with a more satisfactory cosmetic appearance.”⁹⁹ Hosmer developed a knee-bearing prosthesis that incorporated a knee lock, and Bradley worked to smoothly incorporate the mechanisms of the foot, ankle, and knee.¹⁰⁰

Northwestern University, University of California, and the National Research and Manufacturing Company worked on multiple projects. Northwestern conducted two studies: one analyzed “all existing prosthetic devices including studies of mechanisms, materials, and fastenings, construction of test devices, and the correlation of all existing data.”¹⁰¹ The other study surveyed all prosthetic limb patents since the Civil War.¹⁰² This contract helped establish a baseline from which the CPD could measure newer prosthetic developments. Two other organizations contracted for five separate projects each. The

⁹⁶ Bi-monthly Progress Report No. 3, September 15, 1945; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

⁹⁷ Ibid.

⁹⁸ Minutes of Sixth Meeting, October 10, 1945; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

⁹⁹ Minutes of Seventh Meeting, November 28, 1945; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

¹⁰⁰ Bi-monthly Progress Report No. 5, April 1, 1946; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

¹⁰¹ Minutes of Seventh Meeting, November 28, 1945, OSRD.

¹⁰² Ibid.

University of California conducted numerous studies, including:

1. Kinematic and dynamic analysis of the forces involved in walking coordinated with synchronized motion picture studies of the movement of the limb...
2. Electro-myographic studies of muscle actions and phases of motion...
3. Anthropometric studies...includ[ing] a series of statistical measurements on carefully specified dimensions of the upper and lower-extremities...
4. Structure analysis of the constitution of the artificial leg...
5. [D]evelopment and construction of a well engineered fitting machine...¹⁰³

Meanwhile, the National Research and Manufacturing Company worked to provide the CPD with fundamental information on the following:

1. The mechanics of motion and operation of the mechanical foot...
2. The mechanics of motion and operations of an actuated artificial leg...
3. The mechanics and operations of the working parts of the weight-bearing, tubular type artificial leg...
4. The mechanics and operation of a flexible stump grip attachment to an artificial leg...
5. Making a determination regarding the adaptability of the various plastics and plastic laminates for use in prosthetic devices...¹⁰⁴

Many of these entities worked together. Northrop and the University of California had a close working relationship in which they drew on each other's expertise to complete their respective projects.

Funding for these and other prosthetic projects continued throughout the late 1940s, but by 1947 responsibilities toward amputees – and military amputees in particular – began shifting. By that time, many veterans had been discharged from the service and placed under the care of the Veterans Administration; at first, the Army, Navy, and VA all shared responsibility for funding, but eventually it fell solely to the

¹⁰³ Bi-monthly Progress Report No. 4, February 1, 1946; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

¹⁰⁴ Ibid.

VA. In 1948, Public Law 729 provided \$1,000,000 – a spending cap that was removed less than ten years later – in annual funding to the VA for research in prosthetic limbs and other sensory aids. The CPD reconstituted itself as an advisory committee to the VA’s research program, and Northrop, the University of California (Berkeley, San Francisco, and Los Angeles), and New York University created new contracts with the VA. However, the VA, Army, and Navy all maintained separate laboratories.¹⁰⁵

The VA’s guaranteed funding allowed them to provide services such as suction-socket “schools” and prosthetics education programs. Suction sockets, manufacturers discovered, held many advantages over the older suspension methods (see Figure 2.3). Unfortunately, they also discovered the basic mechanics of using a suction socket were not easily explained in a teaching manual. Therefore, they established these workshops, or “schools,” to provide surgeons and prosthetists with practical training in the application of suction sockets. Between 1948 and 1952, the VA and its affiliates, such as the Orthopedics Appliance and Limb Manufacturers Association (OALMA) conducted approximately forty of these workshops.

¹⁰⁵ A. B. Wilson, Jr., “The Role of the Committee on Prosthetics Research and Development and the Committee on Prosthetic-Orthotic Education,” *Bulletin of Prosthetics Research*, no. Fall (1974): 478–86.



Figure 2.3: “Above-knee sockets and methods of suspension: A, total-contact suction socket; B, above-knee leg with Silesian bandage for suspension; C, above-knee leg with pelvic belt for suspension.”¹⁰⁶

The VA established the prosthetics education program at the University of California at Los Angeles (UCLA) to create a central location from which to educate medical and prosthetic professionals in newly available developments in the field. The program, especially the upper extremity courses, became extremely popular, and UCLA conducted twelve six-week courses over two years.

¹⁰⁶ “Above-Knee Sockets and Methods of Suspension,” *Digital Resource Foundation for the Orthotics and Prosthetics Community: Virtual Library Project*, accessed December 6, 2015, oandplibrary.org/popup.asp?frmItemId=1736E46F-EA70-42D4-9183-2A9D3315B46D&frmType=image&frmId=43.

The United States Army, Navy, and the Veterans Administration worked together in the years following World War II to create the best possible prosthetics for veteran amputees and certain civilians. Northrop Aircraft, Inc. contributed to the success of the prosthetic programs by successfully working with government agencies, corporations, and research facilities. Northrop had experience securing government contracts, as evidenced by their aircraft production during the war. Northrop also worked closely with research facilities, such as the University of California, to ensure the most advanced prosthetics were being constructed. Finally, John K. Northrop and his company exhibited leadership that the prosthetics program required. He took the initiative to travel to hospitals and learn more about prosthetics and used the information to provide jobs and better prosthetics to (mostly) veterans who were recovering. Chapter Three delves more into the relationship between Northrop Aircraft and the participants and prosthetic testers in its program, specifically, how Northrop (the organization) as well as individual employees view the personhood and citizenship of these men.

CHAPTER 3

Personhood, Citizenship, and Reintegration into Civilian Life

During and immediately after World War II, Americans faced numerous anxieties about disability caused by the war. Manufacturing companies like Northrop Aircraft, with the support of the Committee on Prosthetic Devices (CPD), sought to reengineer prostheses for amputees as a strategy to restore World War II amputees to civilian life and to relieve those anxieties. To attempt this ambitious goal, Northrop recruited fifty-five amputees – both military and civilian – to aid in the development of more efficient prostheses. But within this grand experiment existed numerous tensions: were these men employees, participants, test subjects, co-designers, experts, objects of study? Were they active agents, or just portrayed that way as to demonstrate the ways that Northrop's research could restore dependent men to independent agents? This chapter examines personhood and citizenship as it relates to Northrop and its program participants, specifically.

As described by Barbara Young Welke, citizenship included “formal practices and obligations” under the law, such as voting rights or serving on juries. Personhood included legal recognition of an individual and their basic rights of security, well-being, and self-ownership.¹⁰⁷ In the context of people with disabilities, however, citizenship frequently took on an economic meaning – that is, the granting or denial of a citizen's perceived right to gain employment and earn wages. Alice Kessler-Harris defined economic citizenship as “the achievement of an independent and relatively autonomous

¹⁰⁷ Wrobel, “Law and the Borders of Belonging Review.”

status that marks self-participation in a democratic society.”¹⁰⁸ She used British social theorist T.H. Marshall’s three-pronged approach to citizenship – which included the civil, social, and political arenas – as a basis for her analysis. Economic citizenship, Kessler-Harris argued, influenced all three of these arenas and generally favored white, able-bodied men supporting a family. White women, people of color, people with disabilities, and other minority groups struggled and often failed to achieve even a fraction of what white men gained through the primary exercise of their economic citizenship—wage labor.¹⁰⁹

Wage labor held the key to numerous benefits that insurers and corporate interests had worked to keep in the private sector, rather than the public sector. The beginnings of an American social welfare system were evident in the establishment of Workmen’s Compensation and Mother’s Aid in the first two decades of the twentieth century, a distinction that Barbara Nelson described as a “two-channel approach” to welfare. Each state implemented its own Workmen’s Compensation and Mother’s Aid programs; the former was designed for white industrial workers, while the latter was designed for poor white working-class widows with young children. The larger welfare state did not emerge until the New Deal in the 1930s. The New Deal enacted important legislation for workers, including the National Industrial Recovery Act (NIRA), which established federal regulations for minimum wages and maximum hours, and the Social Security Act.¹¹⁰ “Security” had become the buzzword of the day. Politicians invoked the idea of

¹⁰⁸ Alice Kessler-Harris, *In Pursuit of Equity: Women, Men, and the Quest for Economic Citizenship in 20th Century America* (New York: Oxford University Press, 2001), 12.

¹⁰⁹ *Ibid.*, 3–18.

¹¹⁰ Barbara J. Nelson, "The Gender, Race, and Class Origins of Early Welfare Policy and the Welfare State: A Comparison of Workmen's Compensation and Mothers' Aid," in *Women*,

security to assuage Americans' fears of the economic instability of the previous decade, and the Social Security Act assisted them in doing so. As Jennifer Klein explains, "With the passage of the Social Security Act, the grassroots movements and New Dealers generated an ideology of security, as well as a new policy of government intervention in the wage relation, of which businesses had to take note."¹¹¹

In taking note, and in order to compete with the government's increasing investment in the social welfare system, private employers began offering employees what Klein describes as "welfare capitalism," a system that "encompasses social welfare benefits and health, safety, or leisure programs offered through the workplace, programs established and directed by the employer."¹¹² As the federal welfare system became bogged down with their own costs, businessmen and insurers took the opportunity to gain ground in the growing insurance industry and limit the number of people they would insure in order to increase their profits. Insurers based their policies on risk, and they usually regarded employer-provided group insurance plans as the safest pools to choose from. This employer-based system disadvantaged groups who did not or could not work, such as elderly people, the unemployed, poor people, and disabled people. The very people who would benefit most from low-cost health insurance and pension plans could not access those options by virtue of their being considered unemployable or high-risk.¹¹³

Disabled veterans, however, had more options through the government than did civilians. Veterans claimed their military service granted them certain "special rights"

Politics, and Change, eds. Louise A. Tilly and Patricia Gurin (New York: Russell Sage Foundation, 1990): 413-35.

¹¹¹ Jennifer Klein, *For All These Rights: Business, Labor, and the Shaping of America's Public-Private Welfare State* (Princeton, NJ: Princeton University Press, 2006), 78.

¹¹² *Ibid.*, 2.

¹¹³ Klein, *For All These Rights*.

worthy of an elevated citizenship status over that of other groups. Americans did (and, arguably, still do) perceive a hierarchy of disabled people in the United States: disabled veterans, disabled industrial workers, and those with a hereditary disability. The first two groups helped “preserve patriotic values and respectable citizenship” through their military service or war work, while the last group experienced a “material stigma that mark[ed] one’s rejection from competent service to society.”¹¹⁴

In 1942 and 1943, disabled veterans and veterans’ organizations worked to persuade the U.S Congress against legislation that would incorporate veterans’ healthcare and civilian healthcare under the same bureaucratic umbrella. Veterans argued that Congress’s bill combined the “special rights” they had earned through their “service and sacrifice” with the happenstance disability that occurred in the civilian population.¹¹⁵ Far from being a happenstance, however, between 1925 and 1945, “over 1,000,000 victims of industrial accidents ha[d] suffered permanent handicaps and ha[d] returned to useful work.”¹¹⁶ In the early 1940s, government agencies studied the effects of hiring disabled industrial workers as well as, or instead of, “normal” workers. Both the Department of Labor and the Civil Service Commission analyzed the main issues of absenteeism, job stability or turnover, accident rates, and productivity. Records indicated that the first three were all lower among disabled workers, while the latter frequently matched or

¹¹⁴ Serlin, *Replaceable You*, 35.

¹¹⁵ Audra Jennings, “An Emblem of Distinction’: The Politics of Disability Entitlement, 1940-1950,” in *Veterans’ Policies, Veterans’ Politics: New Perspectives on Veterans in the Modern United States*, ed. Stephen R. Ortiz (Gainesville: University Press of Florida, 2012): 96.

¹¹⁶ *The Employers’ Mutual Liability Insurance Co. of Wisconsin, Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., 1945, 1783.

exceeded that of their able-bodied counterparts.¹¹⁷ During the war, the government encouraged businesses specifically to employ disabled workers particularly as it related to war work and the labor shortage. Imagery used to convey this idea will be discussed in detail later in this chapter.

The government and businesses were not the only ones expressing anxiety over World War II veterans. Americans often greeted radically different men than the ones who had gone off to fight the war. The general public struggled with fears and anxieties about veterans' reintegration into society following the war. John M. Kinder defined this phenomenon as the "Problem of the Disabled Veteran": a description of disabled veterans' post-war struggles as well as "a perceived national crisis about the social, political, and foreign-policy implications of disabled veterans in modern American society."¹¹⁸ These struggles were particularly evident in the gender roles of wage earning (breadwinning) and veterans' dependence on or independence from the government, friends, and family.

As millions of American men joined the military and deployed overseas, American women found new opportunities available to them on the home front. In April 1942, four months after the bombing of Pearl Harbor, the War Manpower Commission (WMC) was established to handle the homefront labor supply. Unfortunately, the WMC had been created as a policy forum and advisory body rather than an operating agency, so

¹¹⁷ Release from Division of Labor Standards, U.S. Department of Labor, and Untapped Manpower Publication of the U.S. Service Commission, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., 1945, 1778-80.

¹¹⁸ John M. Kinder, *Paying with Their Bodies: American War and the Problem of the Disabled Veteran* (Chicago: The University of Chicago Press, 2015), 3.

its suggestions carried little weight and could not be enforced. The WMC recognized women as the largest group of available workers and wanted to mobilize them into war work. The U.S. relied on voluntary recruitment rather than conscription, so the WMC at first tried enrollment drives; however, its leaders quickly decided their recruitment numbers from these events did not justify the associated costs. Therefore, the WMC turned to a “policy of promotion,” selling the war to the American public as a strategy of labor mobilization. In addition to the WMC, the Office of War Information (OWI) was established in 1942 as the government’s propaganda arm, responsible for explaining government policy and releasing information to the public.¹¹⁹

These two agencies created advertising campaigns urging women to take war jobs using several different tactics. One campaign tactic was to advertise women’s wages equal to that of men’s. This appealed to women who needed to supplement their family income during wartime. Another tactic accused women who did not work as being slackers, implicitly – and frequently explicitly – questioning their patriotism.¹²⁰ Two other tactics are illustrated in Figures 3.1 and 3.2.

¹¹⁹ Leila J. Rupp, *Mobilizing Women for War: German and American Propaganda, 1939-1945* (Princeton, NJ: Princeton University Press, 1978), 74–114.

¹²⁰ Susan M. Hartmann, “Prescriptions for Penelope: Literature on Women’s Obligations to Returning World War II Veterans,” *Women’s Studies* 5 (1978): 223–39; Maureen Honey, “The ‘Womanpower’ Campaign: Advertising and Recruitment Propaganda during World War II,” *Frontiers: A Journal of Women Studies* 6, no. 1/2 (Spring/Summer 1981): 50–56; Alice Kessler-Harris, *Out to Work: A History of Wage-Earning Women in the United States* (New York: Oxford University Press, 1982).



Figure 3.1: "I'm Proud..." U.S. Government Printing Office, 1944. Source: Library of Congress.

The employment poster in Figure 3.1 has an obvious display of patriotism with the American flag in the background. More specifically, however, the poster demonstrates the strategy of encouraging and demonstrating spousal approval for women's war work.¹²¹ The image reflects and encourages a temporary flux in white heterosexual gender roles in the name of patriotism. The woman wears overalls and has her hair pulled back in a handkerchief, and her hands look almost as if she is holding an imaginary tool, implying her willingness and ability to work outside the home.

¹²¹ Rupp, *Mobilizing Women for War*, 74–114.

Furthermore, her husband emphasizes his support for her actions by standing behind her – both literally and figuratively; she tells the audience that she has his approval – he *wants* her to work.

However, propaganda and advertisements made clear from the beginning their belief that war work for women would be merely a temporary arrangement, and that by assisting in the war effort, women were helping to end the war sooner. The American public could accept women stepping out of their proper gender roles if it was understood that it was beneficial to the defense of the country and a temporary fix to a labor shortage. Advertisements illustrated their creators' expectation that women should assume the masculine role of breadwinning only until soldiers returned to take their places, at which time they must reassume their traditional gender roles.¹²² The 1944 Adel Manufacturing advertisement in Figure 3.2 provides an example of this attitude.

¹²² Caroline Cornell, "The Housewife's Battle on the Home Front: Women in World War II Advertisements," *The Forum: Journal of History* 2, no. 1 (2010): 28–42.



Figure 3.2: "Mother, when will you stay home again?" Adel Manufacturing Corporation, May 1944.
Source: Saturday Evening Post.

From the opening line, “Mother, when will you stay home again?,” the audience perceives the expected gender roles for women. The daughter’s question both confirms her mother’s role as homemaker before the war and illustrates the assumption that life would return to the status quo after the war. The company reinforces that assumption in its “answer” to the girl: “Some jubilant day mother *will* stay home again, doing the job she likes best – making a home for you and daddy, when he gets back.” As Caroline

Cornell argues, this advertisement “recognizes the importance of the female worker in helping the war effort, ...clearly points out that women should return to the home once the war ends, ...and seizes on the emotions of American females, utilizing a therapeutic ethos once again to make it appear that she is harming her children if she does not return to her duties at home.”¹²³ The general assumption was that, when the war ended, the defense industry would de-escalate and re-route production to other areas (as Northrop Aircraft did with its prosthetics program). Men would return to the jobs they had left, and women would return either to their homes or to previously held jobs in typically low-paying industries.

Many veterans, however, found it difficult to readjust to their civilian lives. Disabled veterans, in particular, had difficulties in reasserting their independence or accepting dependence on others. Widespread familiarity with disabled veterans and their post-war reintegration struggles came from films such as *The Best Years of Our Lives* (1946). In this movie, disabled veteran and bilateral arm amputee Harold Russell played Homer Parrish, also a disabled veteran, who worked tirelessly (and with a considerable amount of frustration) to achieve physical independence but also seemed content with economic dependence on his government pension.¹²⁴ However, audiences wondered if these attitudes were typical of returning disabled veterans. Further, they experienced anxieties related to the perceptions of the potential dependence or independence of

¹²³ Ibid., 36.

¹²⁴ Extensive literature exists regarding reintegration anxieties portrayed in *The Best Years of Our Lives*, including: David A. Gerber, "Heroes and Misfits: The Troubled Social Reintegration of Disabled Veterans in *The Best Years of Our Lives*," in *Disabled Veterans in History*, ed. David A. Gerber (Ann Arbor: University of Michigan Press, 2012): 70-95; Hartmann, "Prescriptions for Penelope"; Sonja Michel, "Danger on the Home Front: Motherhood, Sexuality, and Disabled Veterans in American Postwar Films," *Journal of the History of Sexuality* 3, no. 1 (July 1992): 109-28.

veterans. Disabled veterans maintained a precarious balance between dependence on and independence from loved ones and the government.

Physical rehabilitation was one of many important social components of reintegration and played a key role in rebuilding men's bodies and assuring the public of the possibility of veterans' independence. Until veteran amputees could master the use of their prostheses, they were heavily dependent on those around them for basic functions, such as brushing their teeth or taking a shower. Prosthetics allowed amputees a sense of independence achieved through regained ability. The rehabilitation process reinforced gender roles by advising veterans to be "tough, uncomplaining, and active in adjusting themselves to the social order, as it was."¹²⁵ Additionally, women were told not to allow their veteran husbands (or other male relations) to become too dependent upon them. They were instructed not to flaunt their own newly-found independence in front of the disabled veterans in their lives, but civilian domestic culture had been forever changed by the mobilization of hundreds of thousands of women into the workforce to take up the slack for men who had left their "traditional positions of family and community authority" to enlist in the military.¹²⁶

World War II also saw an expansion of political involvement in determining the type and availability of care for returning soldiers. In interacting with the government, disabled veterans found themselves in a cycle, which included:

An epic historical event with significant individual and social meanings (participation and injury or illness in a war in specific historical, cultural, and political contexts); an interaction with government (as a provider of services, material benefits, and symbolic recognitions); and medical treatment,

¹²⁵ David Gerber, "Anger and Affability: The Rise and Representation of a Repertory of Self-Presentation Skills in a World War II Disabled Veteran," *Journal of Social History* 27, no. 1 (Autumn 1993): 10.

¹²⁶ Serlin, *Replaceable You*, 23.

rehabilitation, and social reintegration as a disabled individual.¹²⁷

The government bore a large responsibility for being the catalyst of this cycle. From its earliest days, the government associated disability with unemployment, economic dependence, and destitution. Beginning with the American Revolution, government officials realized the importance of providing assistance to disabled veterans. In 1806, the United States Congress passed legislation that set precedents for the definition of disability and the treatment of veterans disabled in American wars. The Act to Provide for Persons Who were Disabled by Known Wounds Received in the Revolutionary War defined disability as the inability to “procure a subsistence by manual labor.”¹²⁸ Veterans who fit the criteria and could prove their disability, usually through a series of exams and affidavits, were placed on the federal pension list; this was the earliest example of the government establishing its responsibilities toward disabled veterans.¹²⁹ More than 130 years later, legislation such as the Vocational Rehabilitation Act of 1943 and the G.I. Bill in 1944 allowed veterans to assert their rights to the medical care, higher education, employment, and housing necessary to establish their economic security and citizenship; they aimed to be “‘tax producers’ rather than ‘tax consumers,’”¹³⁰ community assets rather than community liabilities. Attaining independence – specifically economic

¹²⁷ David A. Gerber, “Disabled Veterans, the State, and the Experience of Disability in Western Societies, 1914-1950,” *Journal of Social History* 36, no. 4 (Summer 2003): 900.

¹²⁸ An Act to Provide for Persons Who were Disabled by Known Wounds Received in the Revolutionary War, Chapter XXV, 9th Congress, 1st sess. (April 10, 1806).

¹²⁹ An Act to Provide for Persons Who were Disabled by Known Wounds Received in the Revolutionary War, Chapter XXV, 9th Congress, 1st sess. (April 10, 1806).

¹³⁰ *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15 and 15a, 79th Cong., 1st sess., September 11-13, 19-20, 25, October 12, and November 20, 1945, 1775.

independence – was important in achieving this goal.

This tax producer/consumer division was evident in the propaganda and advertisements directed at the general public during and immediately after the war. Despite veterans' efforts to resume their civilian roles, the public still remained skeptical that veterans could fully reintegrate themselves into society. John M. Kinder argues that images of disabled people usually conveyed one of two messages. The first used images of disabled veterans to “check public overconfidence in the inevitability of U.S. victory.”¹³¹ The government used images of dead or disabled veterans during the war to remind Americans that soldiers were still in danger overseas and could face even more unnecessary danger if not provided for by the public's monetary sacrifices.

¹³¹ Kinder, *Paying with Their Bodies*, 263.



Figure 3.3: “Care is Costly.” U.S. Treasury Poster, 1945. Source: UNT Digital Library.

The U.S. Treasury poster in Figure 3.3 presents a sanitized version of the violence of war. The government had to portray the physical destruction of war without horrifying its audience, as pictures of concentration camps and Hiroshima would do later. For example, the man in the image appears to be on or near a hazardous military area, as evidenced by his helmet close at hand. He has two obvious physical wounds, neither of which appears severe on its surface. His injuries are bandaged, there are no visible open wounds, and there is very little blood. He focuses down in an exhausted or dejected manner. Overall, he is disheveled, with an unshaven face and torn clothing sitting on the ground against a wall or barricade, expressing the specter of the tramp, joblessness and

dependency, and social alienation that concerned so many Americans. Additionally, the top of the poster announces: “CARE is costly” and urges its audience to “buy war bonds [and] stamps.” The U.S. spent more than \$300 billion (more than \$4 trillion in today’s money) supplying its allies and fighting the war.¹³² The implication was that buying war bonds and stamps would help provide soldiers with needed supplies to avoid injury and potentially head off dependence on long-term care costs through post-war programs.



Figure 3.4: National Employ the Physically Handicapped Week poster, 1951. Source: Smithsonian Institute.

¹³² “Take a Closer Look at War Bonds,” *The National World War II Museum*, accessed February 6, 2016, nationalww2museum.org/learn/education/for-students/ww2-history/take-a-closer-look/war-bonds.html.

The second message that images of disabled veterans convey, according to Kinder, is the value of disabled people as employees. Wage labor was an important step for disabled people to assert their economic independence. During the war, the government encouraged businesses to employ disabled workers to fill the labor shortage caused by able-bodied men joining the military. After the war, the government urged employers to continue hiring disabled workers, including disabled veterans, through awareness campaigns such as “National Employ the Physically Handicapped Week,” which began in 1945.

The poster in Figure 3.4 continues a long-running theme of advertisements featuring prosthetics in action in some type of industry. In the late nineteenth century, the railroad industry was growing, and the number of railway-related injuries increased as well. Well-known limb manufacturers, such as A. A. Marks, illustrated the alleged superiority of their products by incorporating images of men performing various railway job functions. One particular 1897 advertisement showed a man with bilateral above-knee amputations – recognized by society as one of the worst circumstances of amputation – and the Marks artificial limbs he used to regain some ability. Further, the advertisement showed a worker operating a presumably heavy railroad switch while standing on grassy, uneven land between two railroad tracks. This implied the ease with which a man using Marks’s artificial legs could navigate the varying levels of the wood, metal, and gaps of the tracks in the course of his daily work.¹³³

The 1951 “National Employ the Physically Handicapped Week” poster (Fig. 3.4)

¹³³ A. A. Marks, “Advertisement: ‘Our Business Record!’,” *The Railway Surgeon* 3, no. 25 (May 4, 1897), <http://railwaysurgery.org/Limbs.htm>.

echoed some of these ideas, although with a different audience. Marks's advertisement targeted doctors, surgeons, and amputees, while the government's poster appealed to employers. However, they both attempted to show amputees successfully using prosthetics in economically productive situations. The appearance and actions of the poster's disabled worker did much to assuage the fears of its audience regarding the reintegration of disabled veterans. It is important to note that, although the poster does not specifically state to hire disabled *veterans*, many Americans in the post-war era automatically associated disability with military service; therefore, it is likely that association was projected in their interpretation of the image.

The worker in the poster is a unilateral right arm amputee using prosthetic hooks to complete his industrial work. He holds a canister with a tool in his left hand and some type of gauge with his prosthetic hook on his right arm. The worker bends over carefully to read the gauge held steadily between his prosthetic hooks, demonstrating the competency of the hooks in replacing the gripping functionality of a human hand. Regarding his left hand, although it may have been industry standard not to grasp a canister with bare hands, the advertiser's juxtaposition of the worker's hands/hooks provides an interesting comparison. Both arms use hook-like devices to interact with the industrial machinery in the image. The usage of the tool in the workers' remaining left hand eases the audience's transition into viewing his prosthetic hand. For example, the body comes into physical contact with both objects (one a little more permanently than the other), and both implements in this scene act primarily as tools to help the worker complete his job. In this way, the audience can see how prosthetics re-masculinize a man by giving him the means to achieve his economic independence through wage labor.

Again, the idea of citizenship was tied to economics and productivity.

Northrop Aircraft

Northrop Aircraft provided opportunities for both military and civilian amputees to secure their economic citizenship. Fifty-five amputees participated in its government-funded prosthetic programs, at least 15 of whom were veterans. Two amputees, civilian Jerry D. Leavy and Sergeant Lonnie Carberry, were paid; according to Leavy, the remaining amputees volunteered.¹³⁴ While unpaid, however, the volunteers' participation helped them achieve skills they could use in attaining future wage work and secure economic security rather than relying on pensions. The following pictures (Figs. 3.5-3.7) depict Leavy and Colonel Robert S. Allen. These visuals provide an interesting insight into how the government and Northrop's use of imagery portrayed the personhood and objectifications of amputees participating in the project. But first, some background is necessary to place Leavy and Allen's involvement in context.

Unlike most of the others involved in the Northrop program, Leavy was not injured in World War II. On a warm mid-June evening in 1939, twelve-year-old Leavy went in search of fresh cherries for an after-dinner snack. He scaled a neighborhood cherry tree as his bulldog watched from below. Eyeing a particularly delicious-looking bunch at the end of a branch, Leavy stretched out his hand to grab them. Suddenly, the branch snapped beneath his weight, and he plummeted nearly twenty feet to the ground. His arms fractured in multiple places, and his head bled profusely after it struck the glass jar he had brought along to hold the cherries. In that moment, Leavy's life irrevocably changed. His head healed relatively quickly, thanks in large part to his dog licking the

¹³⁴ Jerry D. Leavy, email with author, January 24, 2016.

wound clean in the immediate aftermath of his fall. By the end of June, doctors remained optimistic that they could salvage Leavy's arms through the use of x-ray treatments. Unfortunately, however, these injuries persisted and worsened. He drifted in and out of comas for two months, nearing death multiple times. He contracted gas gangrene due to inadequate cleaning of his fractured arms, leading to their eventual (multiple) amputations (Fig. 3.5). Astonishingly, he survived this ordeal and became personally invested in the design and use of upper extremity prosthetics.¹³⁵



Figure 3.5: Jerry Leavy and his father, Towne, 1939. Source: Jerry Leavy.

¹³⁵ Kristin Woods, “‘It Can Be Done’: Jerry Leavy Has Turned Tragedy into Success,” *Chester Progressive*, February 22, 1995; “Kids Pray and Pal Mends,” *Beatrice Daily Sun*, June 27, 1939.

After his high school graduation and subsequent work running a prosthetic dealership for the Carnes Company, Leavy moved on to work for Northrop Aircraft in their development of prosthetic limbs. In an interview, Leavy could not recall his exact employment dates; however, based on the available sources, the likely range was 1947 to 1953. Leavy worked as a prosthetic tester and amputee counselor, providing feedback to engineers about the usability of various artificial arms. Early in the program, the engineers asked him to test two split-hook arms; Leavy soon discovered that Northrop's hooks were much easier for him to handle and manipulate than the mechanical, cosmetic Carnes arms he had been using since childhood. Within a few weeks, he began using the split-hooks exclusively in his daily life – with the exception of his prosthetic testing duties. Leavy used the split-hook design so efficiently that the NRC frequently called upon him to appear at medical conventions and before Congressional committees.¹³⁶

Colonel Robert S. Allen was born in Latonia, Kentucky, in 1900. He served in the 6th U.S. Cavalry in World War I, attaining the rank of first lieutenant by the time of his discharge. In the interwar years, he enrolled in the University of Wisconsin to study journalism and also acted as a National Guard and Reserve officer. In the 1920s, Allen won a scholarship to study abroad at the University of Munich in Germany. According to newspaper reports, Allen personally witnessed Hitler's failed attempt to overthrow the German federal government in 1923 and later covered Hitler's trial for treason in 1924. By 1929, Allen worked for *The Christian Science Monitor* and established himself as the youngest bureau chief in Washington, DC. In 1930, Allen collected reports about various government officials that the newspaper refused to publish. He recruited *Baltimore Sun*

¹³⁶ Motis, *Contractor's Final Report*; Jerry D. Leavy, *It Can Be Done: An Upper Extremity Amputee Training Handbook* (Quincy, CA: Feather Publishing, 1978), V–VII.

reporter Drew Pearson to compile the reports into an anonymous book form. Their book, *The Washington Merry-Go-Round*, provoked controversy with its “gossipy treatment of the U.S. capitol.”¹³⁷ Their employers soon discovered their real identities and terminated their employment. Allen and Pearson, however, went on to create a syndicated column of the same name and write two more books: a sequel to *The Washington Merry-Go-Round* called *More Merry-Go-Round*, and a book about the Supreme Court called *The Nine Old Men*. They ended their partnership when Allen’s reserve unit was recalled to service in 1942.

Allen rejoined the Army, this time as a major and cavalry officer, and served as chief of combat intelligence of the Third Army under General George S. Patton. On April 7, 1945, while on reconnaissance, German forces ambushed, wounded, and captured Allen. His captors freed him three days later, but the severity of his wounds meant his right arm required amputation above the elbow. Newspaper reports, however, reassured readers that “Allen overcame his handicap, learned to write and type with his left hand, and has functioned as forcefully and indefatigably as ever.”¹³⁸

Following the war, Allen returned to his stint at *The Washington Merry-Go-Round*, uncovering such stories as that of Lieutenant General John C. H. Lee, a high-ranking official serving in the Mediterranean theater, who allegedly lived in luxury with multiple houses, cars, a plane, and a train. Meanwhile, soldiers lived in overcrowded facilities with bad food, little to no recreational options, and the irrational demands of

¹³⁷ “Drew Pearson, American Journalist,” *Encyclopedia Britannica*, accessed January 31, 2016, britannica.com/biography/Drew-Pearson#ref96771.

¹³⁸ “Col. Robert S. Allen Captive of Nazis for Only 3 Days,” *The Washington Post*, April 25, 1945; “Obituary: Robert S. Allen, Political Columnist,” *New York Times*, February 25, 1981; “Robert Allen Reports: How Columnist Got That Way,” *The Abilene Reporter-News*, October 7, 1954.

commanding officers, including caring for their children and saluting them at every turn. Indeed, Lee was widely known as “God-Almighty” Lee “because of his high-handedness and luxurious living.”¹³⁹ Although claiming it was unrelated to Allen’s and other’s investigations, Lt. Gen. Lee retired from the military in 1947. Additionally, Allen worked to bring veterans’ issues to the attention of the American public. He spoke to organizations such as the Young Women’s Christian Association about the needs of wounded veterans;¹⁴⁰ he also spoke about veterans’ economic challenges, such as their feeling the effects of growing inflation first.¹⁴¹

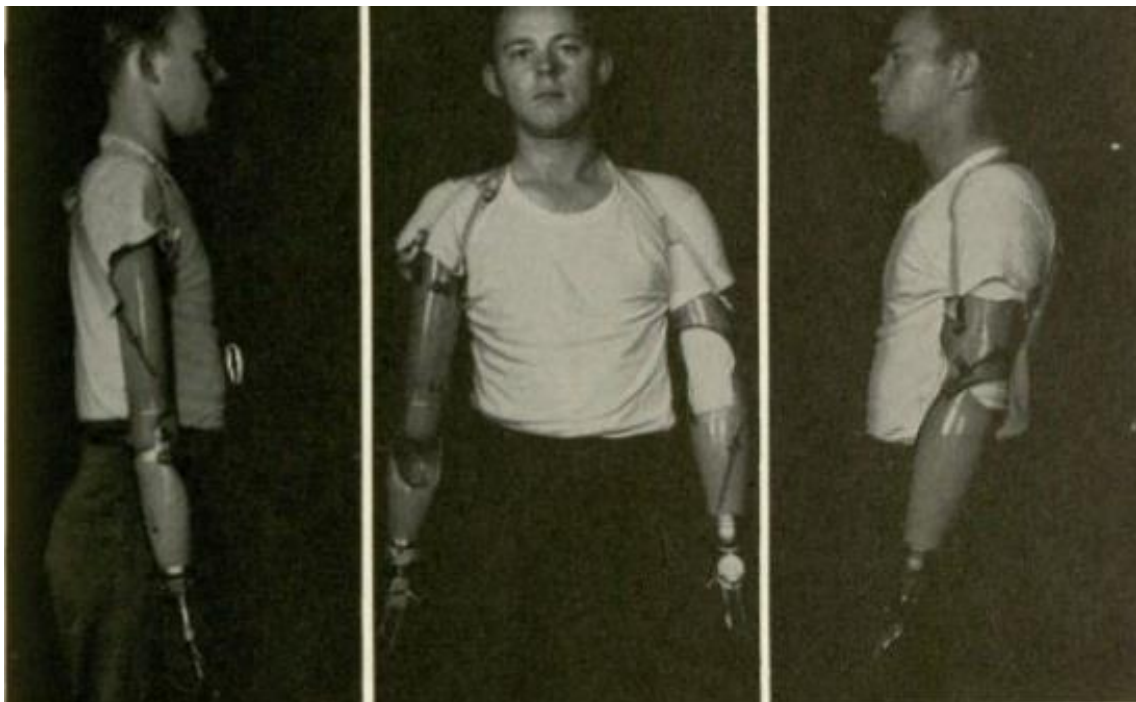


Figure 3.6: Jerry D. Leavy. Source: Northrop Aircraft Contractor's Final Report, 1951.

¹³⁹ Robert S. Allen, “Gen. Lee’s High Living Faces Probe,” *The Washington Post*, August 14, 1947.

¹⁴⁰ “Col. Allen to Speak on Wounded Veterans,” *The Washington Post*, November 19, 1945.

¹⁴¹ “Inflation Will Hit Veterans First, Says Col. Robert Allen,” *The Washington Post*, October 21, 1946.

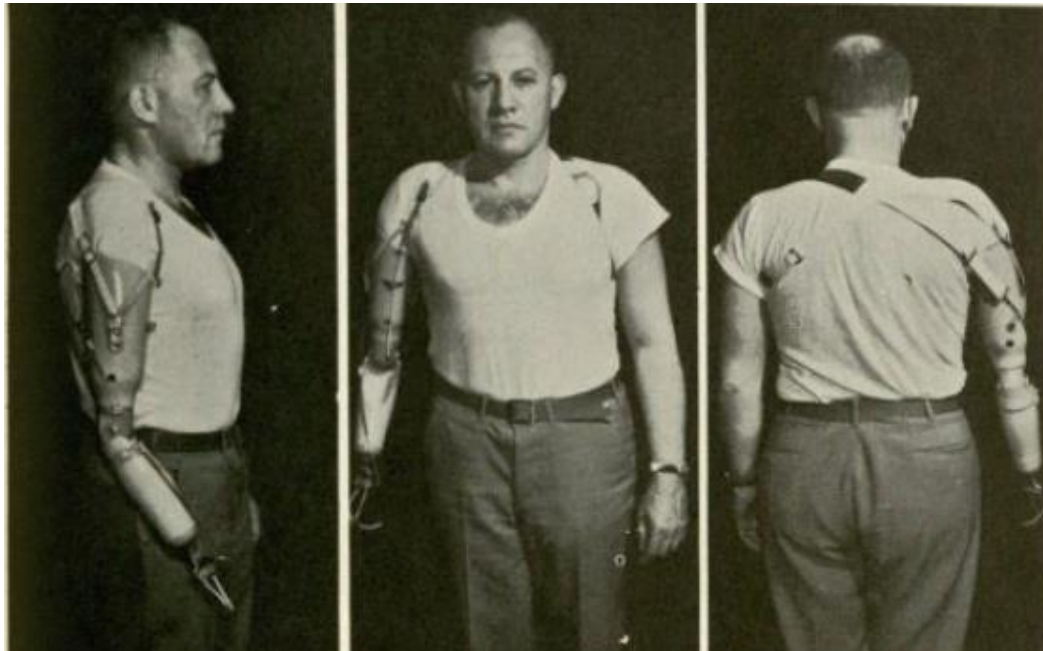


Figure 3.7: Robert S. Allen. Source: Northrop Aircraft Contractor's Final Report, 1951.

The introduction of Northrop's *Final Report* contained a brief mention of the credit due the amputees for their work with the “engineers and artisans” of the prosthetics program. However, the profile shots of both Leavy and Allen (Figs. 3.6 and 3.7) in the report made each man seem like an object or mannequin on display rather than an active participant in the process. Additionally, the terminology in the report stripped amputees of nearly every potential role—co-designer, expert, test subject, participants, employees, or some combination of these roles—in the project. Indeed, in its list of fifty-six staff members, the *Final Report* included only two amputee counselors; the remaining staff included editors, illustrators, machinists, engineers, or other industrial workers. Northrop presented veteran amputees and their prosthetics as objects to be viewed. A selection of the entries under Leavy's profile pictures in the *Report* stated:

4-10-47 Measurements taken for new L.B.E. [Left Below Elbow] and R.A.E [Right Above Elbow] prostheses. Both stump impressions

	made.
4-21-47	Left test laminate too loose. Modified split mold to make new laminate.
4-28-47	Made minor revisions on present left prosthesis. Socket OK.
5-1-47	First harness not satisfactory, Carnes type harness made and fit is good. Upper arm too soft and too small to allow stump sock. ¹⁴²
7-12-47	Miscellaneous test units were fitted during [7-12-47] to 12-31-50 for experimental purposes. No record was kept on amputee as results were recorded on each unit tested. ¹⁴³

With perhaps the exception of the July 12, 1947, entry above, this documentation did not refer to amputees on a personal level; rather, it focused almost exclusively on the equipment. Indeed, many of the photo negatives analyzed by this author from Northrop's programs contained no identifying information regarding the individual but indicated what joint or hook or other development was the focus. Northrop made little to no distinction between veteran and civilian amputees in its final report. Captions underneath each photo merely stated the man's name with no reference to rank or military branch served (if applicable).¹⁴⁴ In this way, Northrop viewed these men as test subjects and objects of study. In an interview with Jerry Leavy, however, he stated the amputees frequently gave input into the design and functionality of the prostheses, positioning themselves as both experts and co-designers in the field of prosthetics, though largely uncredited.¹⁴⁵

In contrast to these sterile and clinical photos, Figures 3.8 and 3.9 cast some of these same amputees as active agents of outreach and promotion. Like the "National Employ the Physically Handicapped Week" poster, showing amputees actively engaged in activities proved their successful rehabilitation and reintegration into able-bodied

¹⁴² Motis, *Contractor's Final Report*, A-15.

¹⁴³ Ibid.

¹⁴⁴ Motis, *Contractor's Final Report*.

¹⁴⁵ Jerry D. Leavy, telephone interview by author, June 5, 2014.

society. One such popular activity was bowling. Bowling allowed able-bodied Americans to garner social capital, what Robert D. Putnam refers to as “connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them.”¹⁴⁶ Bowling – league bowling specifically – encouraged neighborly geniality and the occasional civic conversation. If amputees could not participate in bowling, they would miss these important social interactions necessary for their further reintegration into society. Therefore, devices like the one seen in Figure 3.8 allowed amputees to join the bowling community. All three of the bilateral arm amputees featured in the picture (Fig. 3.8) used a special attachment to go bowling. Without their prostheses, it would be nearly impossible for these men to possess the gross motor functions of grasping and releasing a bowling ball. Additionally, this picture demonstrated the large age demographic involved in Northrop’s program; it also reinforced the idea that bowling appealed to people of all ages. Leavy (pictured on the left) became an amputee at a young age and was one of the youngest participants. Charles McGonegal had fallen victim to a grenade blast in France during World War I and was one of the oldest participants.

In the latter picture (Fig. 3.9), World War II veterans Herman Pheffer (a bilateral leg amputee) and Lonnie Carberry (a bilateral arm amputee and Northrop employee) visited Korean War veteran Robert Smith (a quadruple amputee) at Walter Reed hospital. Pheffer and Carberry comprised the American Legion’s “Amp[utee] Rehabilitation Team” and “tour[ed] veterans’ hospitals to show the wounded service men that amputation is not the end of the world. They show the newly-amputated that you can get around pretty well on artificial legs and take care of yourself fine with artificial arms.

¹⁴⁶ Robert D. Putnam, *Bowling Alone: The Collapse and Revival of American Community* (New York, NY: Simon & Schuster, 2001), 19.

And they help the boys through their low days.”¹⁴⁷ Many people expected amputees, such as Pheffer and Carberry, to act as role models or living examples to future generations of amputees. Both these images served to reassure respective audiences – both amputees and non-amputees – that prosthetic users were more than their disembodied parts and could be successfully integrated into “normal” – that is, non-disabled – society.



**Figure 3.8: Jerry Leavy, Charles McGonegal, & Lonnie Carberry practice bowling, date unknown.
Source: Jerry Leavy.**

¹⁴⁷ “Three Men with Four Limbs and Three Smiles,” *Alice Daily Echo*, 1951.

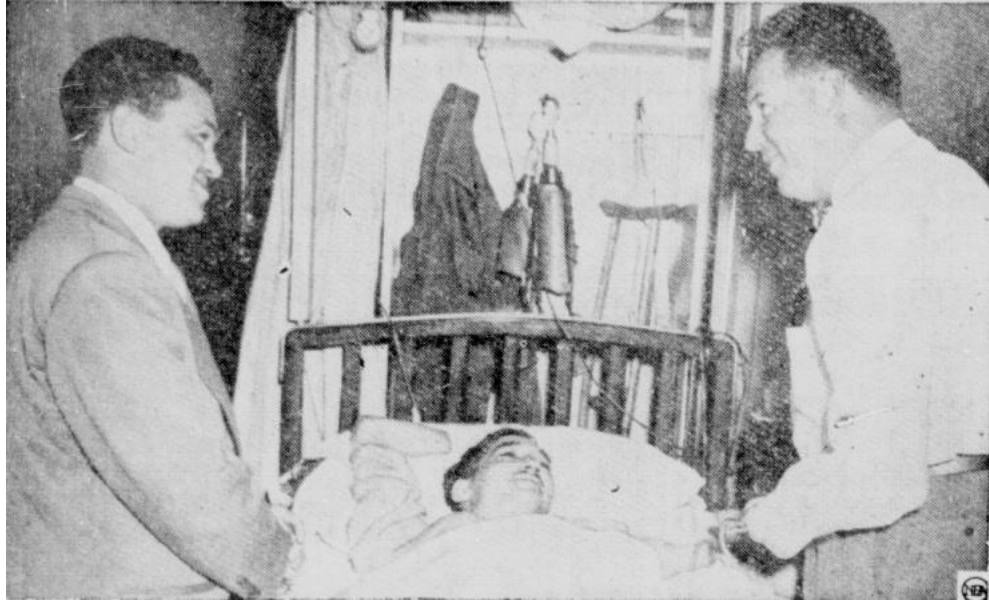


Figure 3.9: "Three Men with Four Limbs and Three Smiles. The 'amp rehabilitation team' - legless Herman Pheffer (left) and armless Lonnie Carberry (right) visit the bedside of quadruple amputee Robert Smith, wounded in Korea." Source: The Alice TX Daily Echo, 1951.

As a civilian, Leavy's presence and participation in Northrop's prosthetics program was unique. One possible reason was Leavy's status as a bilateral arm amputee – that is, both his arms had been amputated. With only sixty-three military bilateral arm amputations during World War II,¹⁴⁸ it seems likely Northrop needed to recruit civilian bilateral prosthetics testers in close proximity to their site in Hawthorne, California, such as Jerry Leavy. Allen's participation was also unique in that he and his partner, Drew Pearson, were well-known journalists who could – and did – report on the problems veterans had in obtaining adequate prosthetic limbs. Shortly before the Committee on Prosthetic Devices (CPD) was formed in 1945, Pearson published a column criticizing the subpar government limbs issued to disabled veterans. One example provided by

¹⁴⁸ David A. Gerber, "Heroes and Misfits: The Troubled Social Reintegration of Disabled Veterans in *The Best Years of Our Lives*," in *Disabled Veterans in History*, ed. David A. Gerber (Ann Arbor: University of Michigan Press, 2012): 81.

Pearson demonstrated how minor problems could become major catastrophes.

One veteran who lost both legs went home on furlough to Rochester, NY – and had to be sent back in an ambulance because both his artificial legs had broken. He was issued another pair of temporary legs. But one night these also went out of commission and he had to drag himself by his hands for half a city block to get home.¹⁴⁹

Like the Treasury Department's "Care is Costly" poster in Figure 3.3, this passage conjured an image of the veteran as an object of pity who desperately needed suitable prosthetics. However, as has been seen, with the assistance of rehabilitation and prosthetics programs such as Northrop's as well as local and community support, many disabled veterans achieved their goals of both physical and economic independence.

This chapter examined personhood and citizenship, particularly as it relates to Northrop and their participants. World War II had thrown the definitions of gender roles into turmoil. To reestablish their traditional male role as breadwinner after being challenged by the women who wanted to remain in the workforce, amputees had to take action to regain their economic independence through wage work. One of the most effective ways to gain independence was learning to operate a prosthesis. As evidenced by images in this chapter, amputees could adjust their prosthesis to engage in work and play. Some of these functions will be discussed in greater detail in the next chapter.

¹⁴⁹ Drew Pearson, "Washington Merry-Go-Round: Poor Wooden Legs," *The Daily Mail*, February 10, 1945.

CHAPTER 4

“Tricks of the Trade”: Amputees’ Attempts at Normality in the Postwar Era

The United States government continued its interest in assuaging the anxieties and fears of amputees and the general public through the funding and distribution of instructional films aimed at the reintegration and normalization of returning veterans. The government and much of the public held certain expectations for amputees to return to “normal” civilian life, including: “overcoming” disability, adapting to new bodies (including prosthetics), gaining employment, and adhering to expected gender roles. One method the government used to communicate these expectations was through films. This chapter discusses the portrayal of amputees through training films and other movies that served to reinforce the dominant middle-class, heterosexual status quo in the process of reintegrating amputees – both military and, to a lesser extent, civilian – back into “normal” society. Three different films from three different viewpoints are discussed in this chapter: *Meet McGonegal* (1944) featuring Charles McGonegal, *Diary of a Sergeant* (1945) featuring Harold Russell, and *Meet Jerry Leavy* (c. 1968).

At the end of World War II, many Americans wanted to “get back to normal,” but “normal” was a fairly ambiguous term. As Wendy Kozol argues, two decades of depression and war meant a literal “return” to normalcy was not entirely possible. “The middle-class norm, however, was an invented tradition, a return to a reality that had not previously existed for most people.”¹⁵⁰ Anna G. Creadick states that “normality” as a

¹⁵⁰ Wendy Kozol, *Life's America: Family and Nation in Postwar Journalism* (Philadelphia, PA: Temple University Press, 1994): 14, quoted in Anna G. Creadick, "Keeping Up Appearances: 'Normality' in Postwar U.S. Culture, 1945-1963" (PhD diss., University of Massachusetts Amherst, 2002).

concept is “imagined and reimagined...to suit the times.” Furthermore, “normality tells us more about *when* it describes than about *what* it describes.”¹⁵¹ The functions required to engage in social activities and display “normality” to the general public varied over time and fluctuated depending on contemporary attitudes. Julian B. Carter describes two material representations of the postwar human ideal – Norma and Norm-man – as “‘normal’ American[s]...a particular kind of person [who] came to be perceived as uniquely modern, uniquely qualified for citizenship, *uniquely natural and healthy*.”¹⁵² There was a societal expectation that Americans would strive to meet this (admittedly unachievable) ideal.

One of the most effective ways to promote and disseminate images of normality to the American public was through motion pictures. Movie theater attendance grew steadily from 1930 until it reached its peak of more than ninety million moviegoers in 1946. Newsreels often preceded feature presentations during the World War II era, and these provided viewers with one of the few visual representations of the war available to them – the other being newspaper (or other print) photographs.¹⁵³ Hollywood produced a variety of WWII movies ranging from satirical, such as Charlie Chaplin in *The Great Dictator* (1939), to inspirational dramas, such as *The Best Years of Our Lives* (1946). Movie studios did so under the guidance of the Bureau of Motion Pictures, which “produced educational films and reviewed scripts voluntarily submitted by the studios,” and the Bureau of Censorship, which “oversaw film exports”; both organizations fell

¹⁵¹ Anna G. Creadick, “Keeping Up Appearances: ‘Normality’ in Postwar U.S. Culture, 1945-1963” (PhD diss., University of Massachusetts Amherst, 2002), 6.

¹⁵² Carter, *The Heart of Whiteness*, 2. Emphasis added.

¹⁵³ Michelle C. Pautz, “The Decline in Average Weekly Cinema Attendance, 1930-2000,” *Issues in Political Economy* 11 (Summer 2002): 54–65.

under the umbrella of the federal government's Office of War Information (OWI).¹⁵⁴ The government itself produced numerous films as well, ranging from patriotic and morale-boosting documentaries, such as Frank Capra's *Why We Fight* series (1943-45), to inspirational instructional films, such as the ones described in this chapter.

Charles McGonegal served during World War I as a private of the Eighteenth Infantry. While in France, a grenade exploded in his hands. He received 102 wounds, including a compound fracture of the right foot, a fracture of the right knee, the loss of five teeth, and the loss of both arms below the elbow. "Outside of that," he said, "I am in good condition." He recuperated at Walter Reed General Hospital and participated in vocational education programs provided by the Federal Board for Vocational Education (FBVE). He first took a business course and then accepted a job as a district manager for a prosthetic limb manufacturer, the Carnes Company. After working there for a year, McGonegal returned to the FBVE to take a commercial course. He worked as an auto salesman and, later, as district manager for a life insurance company.¹⁵⁵

As the end of World War II approached, McGonegal and his friend Walter Antoniewicz (a bilateral leg amputee), in conjunction with the Army Signal Corps, created a short film showing McGonegal's processes in performing routine daily tasks. *Meet McGonegal* (1944) was created for use in army hospitals in order to boost the morale of the recuperating amputees;¹⁵⁶ further, it allowed McGonegal to demonstrate how he adapted to his new body and attempted to overcome his disability. This film

¹⁵⁴ "Overview for Films in World War II," *University of Houston Digital History*, accessed February 15, 2016, digitalhistory.uh.edu/disp_film.cfm?mediatypeid=1&eraid=15&psid=2962.

¹⁵⁵ Federal Board for Vocational Education, "The Most Wounded Private," *The Vocational Summary* IV, no. 1 (May 1921): 6-7.

¹⁵⁶ Charles C. McGonegal, "How I Get Along without Hands," *Saturday Evening Post*, November 25, 1944.

provides a glimpse into the personal life of an amputee and demonstrates the ways in which disabled veterans (and civilians) were “othered” even as they were being encouraged to rejoin “normal” society. One immediately obvious example of “othering” is the third person narration of the film. The film takes its audience into the most personal and private lives of amputees; for example, the opening scene shows McGonegal in his bathroom preparing to shave. At this point, only his face is visible in the mirror.¹⁵⁷

Narrator: “This is my neighbor, Charles McGonegal. I’d like you to meet him. I think he’s an interesting fella.”¹⁵⁸

McGonegal does not introduce himself or speak any lines until the very end of the film. His “abnormality” is carefully and safely described through the shield of a positive-sounding, third party voice.¹⁵⁹

Following this short introduction, McGonegal begins the process of shaving.

Narrator: “What’s unusual about [shaving]? Well, Charlie has no hands. No hands other than those ingenious substitutes [the hooks], but he does things as easily and as casually as any other man.”¹⁶⁰

As the narrator speaks the line, “Charlie has no hands,” McGonegal raises his arm so that one of his prosthetic hooks becomes visible in the mirror as well (Fig. 4.1).¹⁶¹ As Harold Russell would later describe in his autobiography, the audience – mostly amputee veterans in hospitals – frequently expressed curiosity. “Who is this man? How did he lose his arms? How does his situation compare with mine? How does he perform certain essential tasks?”

¹⁵⁷ *Meet McGonegal* (War Department, 1944), https://youtu.be/FSLj5_HgYlo.

¹⁵⁸ Ibid.

¹⁵⁹ Ibid.

¹⁶⁰ Ibid.

¹⁶¹ Ibid.



Figure 4.1 Charles McGonegal shaves with the assistance of his prosthetics, 1944. Source: War Department, National Archives.

The narrator then provides information about McGonegal's injuries in the context of dependence and independence as McGonegal combs his hair. As stated in the previous chapters, veterans, as well as the general public, experienced fears and anxieties related to the reintegration of disabled veterans back into civilian society. Amputees wanted opportunities to gain physical and economic independence, and successful use of prosthetics was vital to reaching that goal.

Narrator: "Charlie prefers to be independent. It never occurred to him before World War I to have somebody else brush and comb his hair. After a grenade exploded and blew his hands off in France, he figured there still wasn't anyone living who could handle the McGonegal cowlick better than McGonegal!"¹⁶²

This information – particularly that it was a wartime injury – likely reassured the

¹⁶² Ibid.

audience of McGonegal's masculinity and increased his credibility with them by highlighting his sacrifice for the nation.¹⁶³

The film also showed the level of McGonegal's dexterity as well as the modifications in certain steps of the morning routine to promote ease of use. In Figure 4.2, McGonegal has buttoned up his vest using a special hook attachment – after the narrator assured the audience that McGonegal *could* use regular buttons, but that the hooks were just a time saver – and proceeded to deftly move his pocket watch from one side to the other. This close-up removes McGonegal's head from the frame. Although that could be necessary camera work to highlight the movements needed for these activities, it could also possibly demonstrate another objectivity and dehumanizing aspect that amputees encounter.¹⁶⁴

¹⁶³ Ibid.

¹⁶⁴ Ibid.

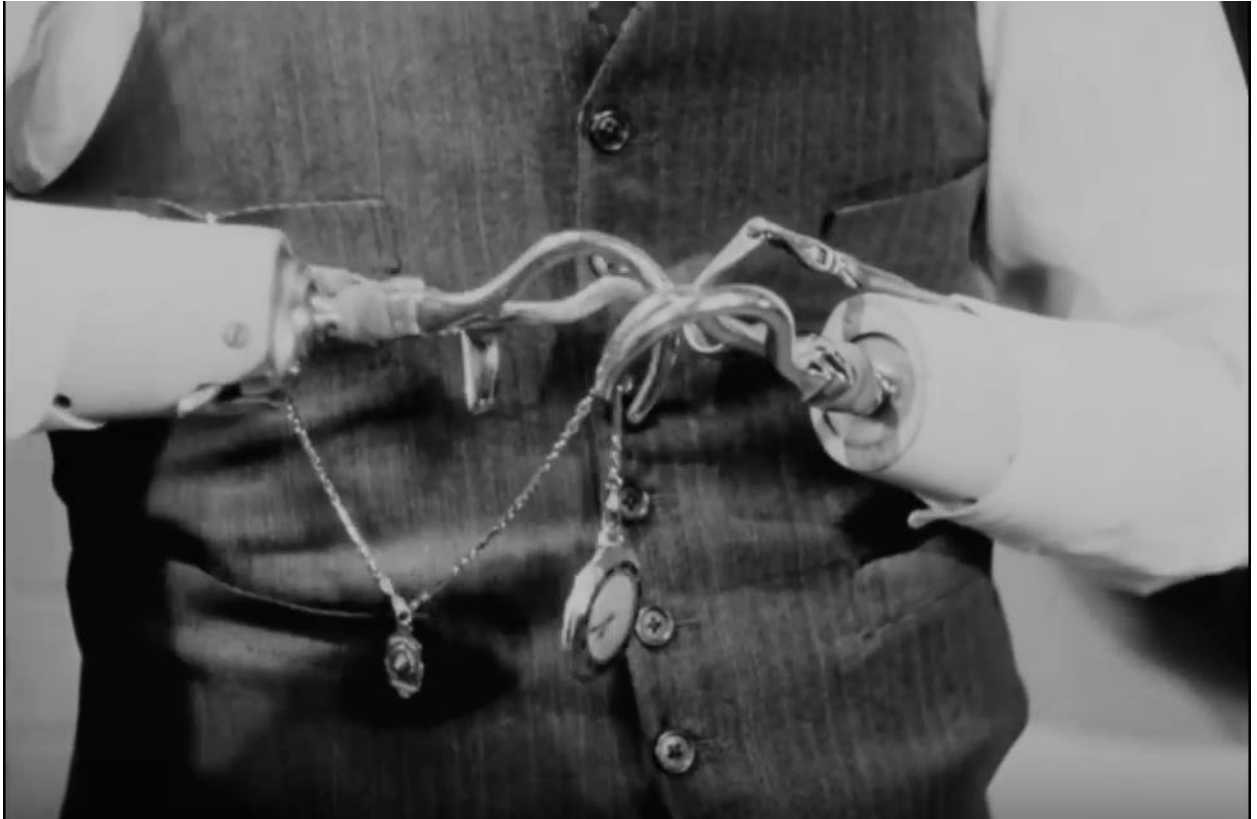


Figure 4.2 Charles McGonegal buttons his vest and moves his pocket watch, 1944. Source: War Department, National Archives.

Eating and drinking required dexterity and fine motor skills for McGonegal as well. The narrator again points out McGonegal's attempts to be "normal" or maintain a life as close to the "Every Man" as possible.¹⁶⁵

Narrator: "One or two companies manufactured special knives, forks, glasses, and coffee cups designed for such cases as Charlie's. But he doesn't even know where to buy them! And he never bothered to find out. He manages very well with the same utensils as you'd find in a restaurant."¹⁶⁶

At this point in the film, McGonegal has shaved, brushed his hair, dressed himself, and eaten breakfast all without the assistance of devices other than his prostheses and the button hooks. Other unmodified devices McGonegal uses included an automobile, a

¹⁶⁵ Ibid.

¹⁶⁶ Ibid.

typewriter, a phone and phone book, and pens and pencils.¹⁶⁷

In about the last two minutes of the video, the audience finally hears from Charles McGonegal himself. He informs the audience that it only took three months for him to adjust to using his prosthetics and gain some level of normality, as evidenced by his successful completion of the activities mentioned above.¹⁶⁸ As a final statement, McGonegal reasserts his normality by referencing his adherence to the societal standard of a white, middle-class, heterosexual husband and father who acts as breadwinner.

McGonegal: “I have a productive job and a happy marriage. My wife and I have two boys. One is in the Navy now. As a matter of fact, the loss of my arms hasn’t been nearly the wallop that I thought it would be at first. With these arms [gestures with hooks], I can do practically anything that anyone can do, and there’s no reason in the world why you fellas can’t do the same.”¹⁶⁹

This list of accomplishments and attitudes McGonegal embraces were to inspire World War II amputees to pursue “normal” lives with as much independence as possible.¹⁷⁰ Additionally, he often visited disabled veterans in army hospitals to both commiserate with and encourage them. McGonegal made one such visit to Walter Reed General Hospital approximately one week after fellow bilateral arm amputee Sergeant Harold Russell had first seen his film.

Russell was born in 1914 in Nova Scotia, Canada. After his father’s death less than five years later, his mother moved with her three sons to Massachusetts. Prior to his enlistment in the army, Russell described his life as a failure. He had failed to make friends, earn good grades, receive a college scholarship, work in a meaningful career, or

¹⁶⁷ Ibid.

¹⁶⁸ Ibid.

¹⁶⁹ Ibid.

¹⁷⁰ Ibid.

win over his sweetheart.¹⁷¹ His inability to achieve these goals brought his masculinity into question and suggested he may not fit society's definition of normality. He joined the army shortly after the bombing of Pearl Harbor, having been rejected from both the navy and marines as "physically unfit" due to missing molars. He trained to be a paratrooper and later attended demolition school, but Russell wanted to see combat. The day he graduated "demo school," however, the commandant asked him to remain as a demolitions instructor. He initially refused, but after receiving certain (later unfulfilled) guarantees, he ultimately agreed. The commandant, Captain Phillips, told Russell that the teaching assignment would not last more than six months, the additional experience would help him in the field, and that the relative newness of the paratrooper units meant they may not see any combat for a year anyway.¹⁷²

That newness faded very quickly and, according to Russell, "the War Department had finally realized the value of airborne troops and had decided to expand that branch of the Army greatly."¹⁷³ The paratrooping and demolitions schools had enrollment that grew exponentially; the high demand meant Russell was "stuck" as an instructor and would have to wait longer to join a combat unit. One incident in particular caused Russell to push even harder for a transfer. As he stood on the ground, a fellow non-commissioned officer demonstrated how to set a charge in a tree. The charge exploded and the other officer fell out of the tree, revealing his hand had been blown off during the explosion. Eleven instructors out of eighteen had been injured in the seven months Russell had been teaching. If he were injured, he reasoned, he would prefer to "[trade] an arm or a leg for a

¹⁷¹ Harold Russell, *Victory in My Hands* (New York: Creative Age Press, 1949), 14–17.

¹⁷² *Ibid.*, 51–74.

¹⁷³ *Ibid.*, 79.

Kraut or Jap” than “[get] it while [he] was still in the States.”¹⁷⁴ Finally, on January 10, 1944, Russell transferred to the 515th Parachute Infantry Regiment of the 13th Airborne Division.

According to Russell, the regiment’s colonel believed his soldiers were “getting soft and needed stiffening,”¹⁷⁵ and the soldiers were ordered to construct “infiltration courses”¹⁷⁶ – complete with barbed wire, live ammunition, and explosives – for everyone in the regiment to complete. At the last minute, Russell agreed to oversee the demolition platoon for a friend whose girlfriend was visiting. On the morning of D-Day, the soldiers of Camp Mackey heard the news and worked with a renewed sense of urgency. The demolition platoon, led by Russell, was preparing explosive charges when the cap and fuse Russell held exploded, completely destroying his hands.¹⁷⁷ The next day, doctors amputated both his hands three inches above the wrist. Less than two weeks later, they transferred him to Walter Reed General Hospital.

Russell was apprehensive about the reception he would receive at the hospital, but he soon realized that his ward, Ward 32, was the amputee ward. He described his fellow amputees as a “friendly lot” with “their own language for describing themselves”¹⁷⁸ depending on the location and number of the soldier’s amputation(s). For example, “One-armed men were ‘paperhangers.’ [Fellow bilateral arm amputee] Tony and I were called ‘hooks.’”¹⁷⁹ He was surprised to learn the men on the amputee ward did not patronize him for having lost his hands while still stateside; some of them said he was lucky not to

¹⁷⁴ Ibid., 79–80.

¹⁷⁵ Ibid., 83.

¹⁷⁶ Ibid.

¹⁷⁷ Ibid., 86–88.

¹⁷⁸ Ibid., 92.

¹⁷⁹ Ibid.

have gone overseas.

Russell made some progress in his physical rehabilitation and began adapting – physically, if not mentally – to his status as a bilateral arm amputee. He devised contraptions he could use with his bandaged stumps¹⁸⁰ that would allow him to smoke and eat without the assistance of prosthetics or a third party. He also began occupational therapy to practice the use of items such as pencils, ping-pong paddles, and eating utensils.¹⁸¹ Unfortunately, his mental rehabilitation did not progress so swiftly. Russell was plagued with fears of reintegration and thoughts of “what it was going to be like, going out there alone, without hands. Would they give me a break? Would they be morbidly inquisitive? Would they be indifferent?”¹⁸² For these reasons, Russell originally chose the option of cosmetic hands rather than split hooks. He wanted to appear as “normal” to the public as possible; however, he soon discovered their very limited use.¹⁸³

In mid-August, Walter Reed screened *Meet McGonegal* in the amputee ward. As discussed above, the film showed McGonegal successfully completing the daily tasks Russell struggled to accomplish. Russell said he watched the movie “in awe.”¹⁸⁴ In his second autobiography, Russell showed his resolve to overcome his disability by writing, “If Charlie McGonegal, fellow soldier and victim of a terrible war accident can do it, so can I!”¹⁸⁵ One week later, McGonegal visited Russell in the hospital and continued

¹⁸⁰ Current terminology favors the use of “residual limb” over that of “stump.” However, many of my sources date from the 1940s-1950s at which time “stump” was the commonly used term. Therefore, for the sake of consistency and context, I have opted to use the earlier terminology.

¹⁸¹ Russell, *Victory in My Hands*, 94–99.

¹⁸² *Ibid.*, 95.

¹⁸³ *Ibid.*, 99.

¹⁸⁴ Harold Russell and Dan Ferullo, *The Best Years of My Life* (Middlebury, VT: P. S. Eriksson, 1981), 16.

¹⁸⁵ *Ibid.*

visiting regularly. He advised Russell regarding how he should interact with the public as an amputee. Russell stated, “McGonegal made me see that to make other people feel comfortable with my injury, I first had to feel comfortable with myself.”¹⁸⁶

In mid-October, the day before Russell was scheduled to go before the discharge board, Major General Norman T. Kirk, Surgeon General of the U.S. Army, invited him to lunch. Kirk told Russell that, although *Meet McGonegal* was highly useful in helping amputees “understand and appreciate the positive aspects of overcoming the loss of a limb,”¹⁸⁷ it had not achieved maximum results. World War II veterans found it difficult to relate to a disabled veteran of “another war, another era, and [of] a different breed.”¹⁸⁸ Where World War I disabled veteran McGonegal had had more than twenty years to perfect his usage of prosthetic hooks, his World War II counterparts had only a few months to adjust to their prosthetic, complete their rehabilitation, and reenter the civilian world. Therefore, Kirk wanted to update the film to increase its appeal to the new generation of veterans. Walter Reed’s public relations officer, Major Hall, suggested calling the updated film *Beat McGonegal*, encouraging soldiers to engage in friendly competition and try to master their prosthetics faster than McGonegal had done. Julian Blaustein, the film’s director, had other ideas. Unlike *Meet McGonegal*, Blaustein wanted his film to tell a story instead of simply going through the motions of daily activities. His goal was to show that “handicapped people have nothing to hide or be ashamed of, and that with training and understanding, they do what other people do.”¹⁸⁹

Blaustein ultimately decided on the name *Diary of a Sergeant*. It was narrated in

¹⁸⁶ Ibid., 16–17.

¹⁸⁷ Ibid., 27.

¹⁸⁸ Ibid.

¹⁸⁹ Ibid., 28.

the first person (as a voiceover) – another distinction from *Meet McGonegal*, which had been narrated in third person. However, Russell himself did not provide the vocals for the voiceover; it was later dubbed in by Broadway musical comedy star Alfred Drake.¹⁹⁰ The film begins on a drearier note than *Meet McGonegal*. Russell lays on a gurney covered from head to toe except his face, as a nurse pushes him into the operating room, where the audience sees the surgery in progress. However, as the title implies, the main theme tying the story together is that of Russell's diary. His first diary entry in the film is on the date of the explosion that caused his injuries, June 6, 1944.¹⁹¹

Russell: "This was the day I lost both my hands. On this June day in 1944, someone else's fingers were writing down my words in my diary. But there just weren't any words for the things I thought of."¹⁹²

Already, Russell exhibits bouts of helplessness and dependence on those around him, but he wanted to change that. He began making modifications to everyday items so that he could function as "normally" as possible, again showing his desire to overcome his disability and adapt to his new body. As one of the most accepted social activities of the 1940s, one of Russell's first goals was to re-learn how to hold and light a cigarette. In the beginning, he required total assistance in completing both tasks. As he continued to practice smoking, he and the veterans in neighboring beds developed a cigarette holder that could be held in place by the bandages on Russell's forearms. He only required assistance in lighting. Finally, once he had obtained and received training in the use of his prosthetic arms, Russell was able to complete both tasks without assistance, gaining a small degree of the independence he sought.¹⁹³

¹⁹⁰ Ibid.

¹⁹¹ *Diary of a Sergeant* (War Department, 1945), <https://youtu.be/I4ryvwZin74>.

¹⁹² Ibid.

¹⁹³ Ibid.

According to the film, after three weeks at Walter Reed, hospital employees showed the amputees a short film, the aforementioned *Meet McGonegal*. Russell was encouraged by the way McGonegal had incorporated the use of his prosthetics in “normal” activities, such as “shaving, and eating, and dressing himself.”¹⁹⁴ Russell focuses on the utilitarian aspects of prosthetics that are otherwise “unnatural” in appearance. A hook (or hooks, in his case) might appear frightening to many; however, he maintained they benefited him in “normal” daily functions. The film encouraged Russell so much, in fact, that he set a goal to build his strength and gain the use of prosthetic hooks even more quickly than McGonegal’s three-month time frame, despite the doctor’s opinion it would take at least six months.¹⁹⁵

At approximately twice the running time as *Meet McGonegal* (11:19), *Diary of a Sergeant* (23:49) dedicated more time to describing the rehabilitation process. The hospital housed an orthopedic occupational therapy shop to train amputees on the use of prosthetics in certain tasks and professions. Here, Russell writes “Dear Mother” for the first time since his injury with the assistance of a cuff and pen attachment (Fig. 4.3). By August 3, 1944, less than two months after his injury, Russell was able to write entries in his own diary again. Other activities included playing ping-pong, smoking cigarettes, dialing the rotary and pay phones, driving a car, and drinking from fragile cups and glasses, just to name a few. This allowed him to interact socially – both inside and outside the hospital – and gain even more independence.¹⁹⁶

¹⁹⁴ Ibid.

¹⁹⁵ Ibid.

¹⁹⁶ Ibid.



Figure 4.3: Harold Russell writes a letter to his mother five weeks after his injury, 1945.
Source: War Department, National Archives.

Russell's doctor decided to fit him with prostheses, and the film demonstrates this process to some degree. Doctors and technicians create plastic forearms called "buckets" from molds wrapped around the amputee's residual limb(s). Russell compares the fit of the buckets to the airplanes that many of the men had helped build or fly.¹⁹⁷

Russell: "[Buckets] had to fit snugly with no more tolerance than you'd find in the cylinders of a P-38. The reach had to be just right. *Everything* had to be just right because these were going to be my new hands. Strong enough to carry a trunk, sensitive enough to thread a needle."¹⁹⁸

This is an interesting comparison of activities to describe the capacity of prosthetic hands.

Russell wanted to prove to his audience that his prostheses were not things to be feared,

¹⁹⁷ Ibid.

¹⁹⁸ Ibid.

but rather things that adhered to the heteronormative social norms in the United States. His hooks represented strength and masculinity through many of the tasks he performed (such as carrying a trunk), but also soothed anxiety about the potential damage the hooks could inflict by evoking the imagery of a delicate needle and thread. Feeling confident, Russell began trying other activities, such as drinking a glass of milk, that were not quite as successful. This allowed both him and his audience to recognize some setbacks would occur, so he decided to return to the basic training he had learned for his prostheses.¹⁹⁹

According to the film, after three months at Walter Reed hospital, the military granted Russell a furlough. On the train ride home, he encountered an attractive woman and hesitated about his potential interactions with her:²⁰⁰

Russell: “I spotted a seat [on the train]. Then I saw who was on the other half of it, and...well, I didn’t want to scare her away like Little Miss Muffet...So I sat there thinking of how I would’ve done it if I had met a girl like that when I still had my hands. I’d have had a conversation going in two seconds flat! ‘Tough traveling nowadays,’ I’d have said. If that hadn’t worked, I’d have talked about the weather, which works when nothing else does...but there I was, sitting across the way, scared that it would scare *her* to see my hooks.”²⁰¹

This fear and anxiety toward disabled veterans, and amputees in particular, echoed throughout military and civilian life. Russell clearly wanted to participate in the social norms of heterosexual flirting and/or dating, but he seemed certain that his prosthetic limbs would impede his ability to engage in these types of activities. However, the audience later learns that Russell *did* take the initiative in asking the young woman on a date. He tells the audience that his date viewed his hooks as something to take for granted, like “too many freckles or flaming red hair.”²⁰²

¹⁹⁹ Ibid.

²⁰⁰ Ibid.

²⁰¹ Ibid.

²⁰² Ibid.

Diary of a Sergeant ends with a plea from the United States Army Surgeon

General Norman T. Kirk:

There are many thousands of men who are today engaged in that same struggle, the struggle to be able to take their place in normal, everyday life. They are the men who fought and won *your* war. We must make certain that they win their fight for equality and opportunity. They are the men who lived normally before the war and whose one desire is to live normally now. Without your help, they cannot possibly succeed. For regardless of how much patience, faith, and sheer courage they may have, they must also have the equipment, the hospitals, the nurses and the doctors.²⁰³

Kirk describes the humanizing characteristics of disabled veterans to non-disabled Americans by assuring them of amputees' desire to return to normality and emphasizing American's economic responsibility to care for amputees until they could reach such normality, when they could care for themselves both economically and personally.²⁰⁴ In this film, normality equals heterosexual dating, smoking, drinking milk, ping-pong, and independence.

Director William Wyler watched the training film after having agreed to direct *The Best Years of Our Lives* and advised producer Samuel Goldwyn to hire Harold Russell for the role of Homer Parrish. This character was a disabled sailor who had lost both his hands in a naval battle that had claimed the lives of hundreds of his shipmates. He expressed fear and anxiety about returning to his pre-war life, which included parents, a little sister, and a girl-next-door sweetheart he had promised to marry. Russell's portrayal of this character earned him a 1947 Academy Award for Best Supporting Actor as well as an honorary Oscar for "bringing aid and comfort to disabled veterans through

²⁰³ Ibid.

²⁰⁴ Ibid.

the medium of motion pictures” (Fig. 4.4).²⁰⁵ Russell remains one of the most unique members of American film history as one of only two non-professional actors to earn an Academy Award for acting and the only one to earn two Academy Awards for the same role.



Figure 4.4 Samuel Goldwyn, Harold Russell, and William Wyler at the 1947 Academy Awards. Source: Oscars.org

The quest for normality from a civilian perspective is most readily apparent in the life of Jerry D. Leavy. Of the three men discussed in this chapter, Leavy had perhaps the most experience in adjusting to the demands of a “normal” life. As mentioned in Chapter Three, doctors amputated Leavy’s arms after he fell from a cherry tree at the age of twelve. His first prostheses were Carnes mechanical arms, which – like many prostheses

²⁰⁵ Ronald Bergan, “Obituary: Harold Russell, 1914-2002,” *The Guardian*, February 5, 2002, Accessed September 5, 2015, theguardian.com/news/2002/feb/06/guardianobituaries.

of the day – favored form over function. The arms included articulated fingers and thumb, all capable of motion. However, Leavy found the Carnes arms challenging to use because they were oversized, heavy, and cumbersome. Carnes could fit forearm “buckets” for Leavy, but it did not manufacturer child-sized hands. Therefore, in considering the cost of prosthetics and Jerry Leavy’s future growth rate, the Leavy family decided to buy hands he could “grow into.” Leavy’s book, *It Can be Done*, described some of the difficulties he faced in performing perceived normal functions and adjusting to this new extension of his body:

The months seemingly dragged by, each day finding a new way to do things without the help of others, Jerry found himself back at school coping with the problems of learning to write with the oversized, heavy, clumsy hands, plus trying to carry books from one class to another, and finally trying to put on heavy boots and coats during the snowy winter months for the long trek home from school.²⁰⁶

Leavy’s awkward, but successful, use of his Carnes arms garnered him a spot in a photo shoot for the company at the age of thirteen. These images (Figs. 4.5 and 4.6) give a better perspective of the unwieldy nature of Leavy’s arms. Additionally, this began his career as a veritable “poster child” (and, later, a “poster adult”) of prosthetic companies.

²⁰⁶ Leavy, *It Can Be Done*, V; “The Carnes Arm Puts You Back on the Payroll!,” c 1939.

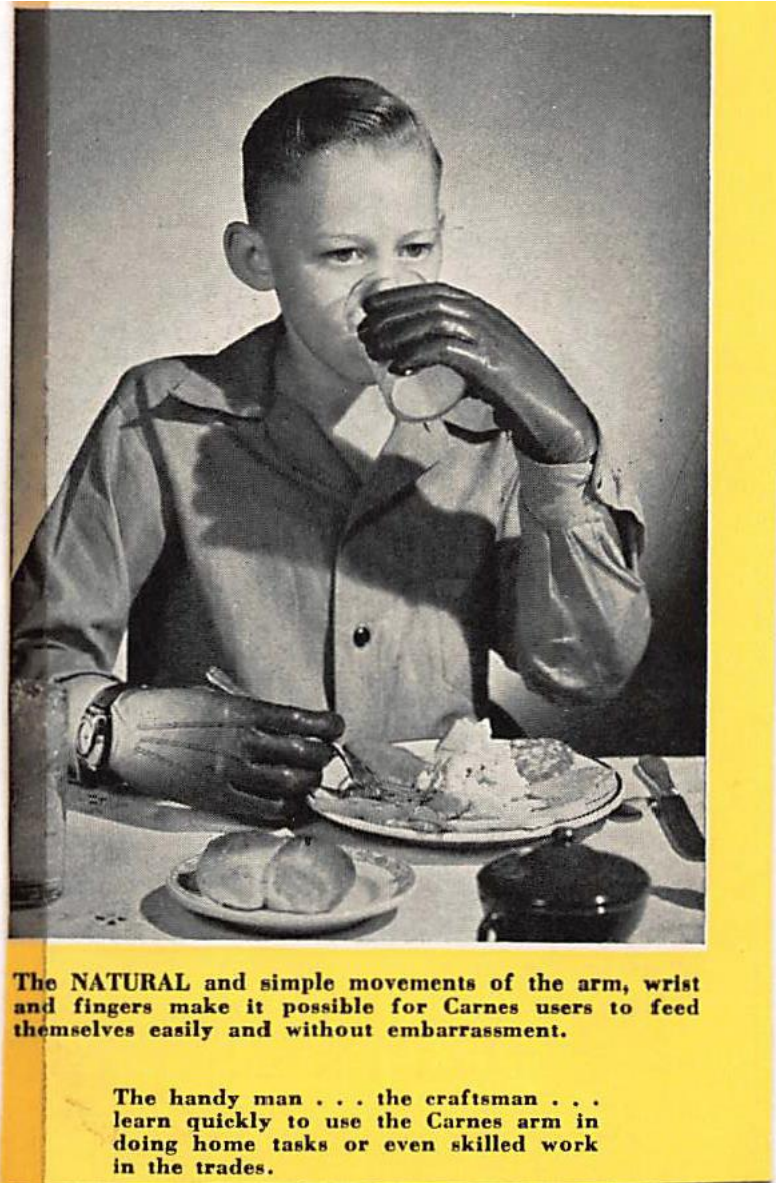


Figure 4.5: Carnes Company brochure showing Jerry Leavy eating and drinking while using his Carnes arms, c. 1939. Source: Jerry Leavy.

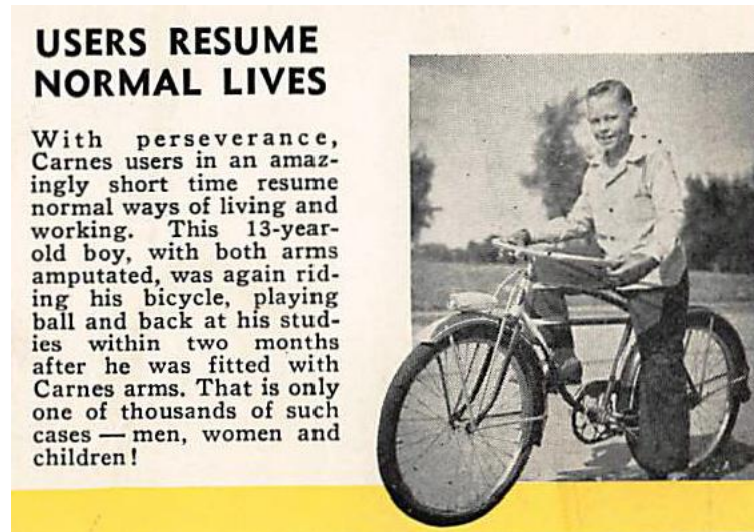


Figure 4.6: Carnes Company brochure showing Jerry Leavy riding a bicycle while using his Carnes arms, c. 1939. Source: Jerry Leavy.

In Figure 4.5, Leavy’s prosthetic hands do, indeed, appear several sizes too large for him and seem to engulf his fork and glass of milk. However, the brochure emphasizes the “NATURAL” movements of the prosthetic and assures its audience that independence is possible and users are able to “feed themselves easily and without embarrassment.” In Figure 4.6, the brochure emphasizes normality, stating that “users resume normal lives” in “an amazingly short time.” Like the films previously discussed, one of the messages here seems to be that “if this person can adapt to a ‘normal’ life with prosthetics, so can you!”

The bombing of Pearl Harbor occurred just one week before Leavy’s fifteenth birthday. Too young to join the military, Leavy moved to southern California with his family and attended high school. He assisted his disabled father in searching for employment, focusing mainly on the factories producing aircraft parts. Leavy’s father finally secured a job at Douglas Aircraft in 1942. Leavy graduated high school in 1944 and immediately began looking for a job. At the age of nineteen, he began operating the

Carnes Company's western region, from the Rocky Mountains to the Pacific Ocean.

When Carnes filed for bankruptcy approximately two years later, Leavy began his work at Northrop Aircraft, as discussed in Chapter Three.

Following his extensive work with Northrop and the federal government, Leavy continued to expand his prosthetic expertise when he joined the A. J. Hosmer Corporation, a prosthetics company, as a vice president in 1953.²⁰⁷ Over the next fifteen years, he traveled across the country with his family as he visited potential clients; provided prosthetic demonstrations in foreign countries, including Greece, Poland, Yugoslavia, and Colombia; and bought and learned to fly his own private plane (Fig. 4.7). Indeed, in 1956, Leavy convinced the Federal Aviation Administration (FAA) of his ability to fly and earned his pilot's license. He subsequently became the first bilateral amputee pilot in the country to log 5,500 flying hours.

²⁰⁷ The A. J. Hosmer Corporation exists today as the Hosmer Dorrance Corporation.



Figure 4.7: Jerry Leavy in his plane, date unknown. Source: Jerry Leavy.

In other work at Hosmer, Leavy created at least two instructional films, both from 1968 and both funded by grants from the federal government: *Controls Training for the Bilateral Amputee* and *Meet Jerry Leavy*. The main audience for *Controls Training* included physical and occupational therapists. Leavy demonstrated how he put on and took off his prosthetic arms, identified the primary components of the prosthetics, and described important early training procedures for both the amputee and the therapist.²⁰⁸ Although the latter film, *Meet Jerry Leavy*, was made significantly later than the previous films, this inside look at the personal and professional lives of Leavy completes the story

²⁰⁸ *Controls Training for the Bilateral Amputee*, 16mm color (San Jose State College, 1968).

of a young child injured and mutilated in an accident at age twelve into a functioning and “normal” adult of forty-two.²⁰⁹

Meet Jerry Leavy was narrated in the first person, similar to *Diary of a Sergeant*; however, Leavy provides the vocals for this film, unlike Russell. Of all three films discussed here, this one provides the most detailed look at the most personal and intimate of routines. Leavy gives his audience – presumably amputees, doctors, and physical therapists – advice on “tricks of the trade,” or easily adaptable shortcuts for amputees to complete their daily routines. He chooses to use his bare residual limbs, or stumps, to do much of his personal grooming, rather than rely on prosthetic arms.

There are many reasons why the prosthesis is not used. Naturally, if I had much shorter stumps than I have, I would have no alternative but to use an electric razor and don the prostheses first. But in the situation that I’m in, it certainly makes life easier to handle all of these sequences before I ever put the prostheses on.²¹⁰

In the films featuring McGonegal and Russell, the audience saw men without prosthetics only when their limbs were bandaged, if they saw them at all. Leavy, however, deftly manipulates his unbandaged and long-healed stumps to perform a variety of tasks, including handling razor blades, gauging the temperature of the water, and applying appropriate pressure to his face (Fig. 4.8).²¹¹ He demonstrates his adaptation to his new body both with and without his prostheses.

²⁰⁹ *Meet Jerry Leavy*, 16mm color (San Jose State College, 1968).

²¹⁰ Ibid.

²¹¹ Ibid.



Figure 4.8 Jerry Leavy applies soap to his face before shaving, 1968. Source: Jerry Leavy.

Unlike the first two films discussed, Leavy cares little for the somewhat strange appearance of his actions, as long as he accomplishes his tasks. He explains:

It's obvious to watch all these movements that go on that every part of the body is used as much as possible to accomplish the task: the teeth, and the knees, and the stumps, the toes in opening the drawers...all of this is simply a matter of practice on the amputee's part.²¹²

It seems unlikely this style of filmmaking would have been used nearly a quarter of a century earlier at the end of World War II, when McGonegal and Russell's films were released.

In addition to narrating nearly every action he made in this film (an important wealth of knowledge in and of itself), Leavy also explains his reasoning behind certain

²¹² Ibid.

decisions or processes and how that experience compared to similar activities using prosthetic hooks. For example, he preferred to use his stumps, knees, and so on instead of his prostheses because many tasks could be accomplished without worrying about water and soap (or shaving cream or toothpaste) running all over the hooks and rubber bands, which could ultimately cause malfunctions and/or problems in cleaning the prosthetic arms. Using his hooks to shave or brush his teeth means he would have had to use his chin (or similar area) to gauge the temperature of the water instead of his stumps.²¹³

After shaving, Leavy undresses down to his boxer shorts and demonstrates how he takes a shower in the mornings. He explains that, for him, showering is easier than bathing. He asked his wife to modify a standard bath towel so that two corners had pockets for ease of use with his stumps. Rather than trying to grasp a bar of soap between his two arms, Leavy opts to use one bath towel as a wash rag, drops the soap on top of it, and uses his foot to lather the towel with soap. Although he is able to use his modified towel to wash most of his body, amputees with shorter stumps may not have that option, as Leavy explains.²¹⁴

Without question, it certainly takes a fair amount of energy to do this because you have to go into all types of contortions and you only have a limited amount of length of the stumps that you have to work with. In the case of very, very short stumps, then you have to revert to a bathtub and sit in the tub and perhaps use the feet, use whatever's available to, to accomplish the bathing process.²¹⁵

In relation to the energy expended in daily tasks, Leavy also describes the excess perspiration many amputees experienced. He states a large part of the human cooling system is the hands and forearms. Without those, amputees are prone to excessive

²¹³ Ibid.

²¹⁴ Ibid.

²¹⁵ Ibid.

sweating, which can make use of prosthetics more difficult; “stump socks” help mitigate that problem by absorbing much of the sweat.²¹⁶

As Leavy begins the process of getting dressed, he first puts on his stump socks and then dons his prosthetic hooks. He talks about the importance of both an amputee’s comfort and appearance in dressing.²¹⁷

It’s extremely important that all of the clothing, such as the t-shirt, be straightened out and all the wrinkles taken out of it as well as the stump sock. If not, wrinkles would appear and the amputee would become very uncomfortable during the day, and it goes without saying that if the comfort is not there for the amputee, he cannot do his best in functioning the prosthesis.²¹⁸

For most of his underclothes, such as socks and undershirts, Leavy preferred using nylon rather than cotton because it could stretch more; additionally, tight-woven clothing was easier to handle than loose-woven. After dressing in his slacks and shoes, he then combs his hair in front of the mirror. This mirror is important, he explains, because without it “the amputee would have no reference as far as sensory feedback is concerned.”²¹⁹ Like McGonegal, Leavy uses a special buttonhook attachment for his shirts (Fig. 4.9); also like McGonegal, the film frequently zooms in on Leavy’s actions, giving the audience a better view of his actions, but removing his head and the rest of his body from the frame.

²¹⁶ Ibid.

²¹⁷ Ibid.

²¹⁸ Ibid.

²¹⁹ Ibid.



Figure 4.9 Jerry Leavy buttons his shirt using a buttonhook, 1968. Source: Jerry Leavy.

Perhaps one of the most difficult dressing tasks Leavy has to complete is tucking his shirt into his slacks. With no sensory feedback, Leavy cannot always tell how effective his efforts have been; additionally, the zipper, button, and belt can be difficult to manipulate without extensive practice.

After dressing, Leavy goes into the kitchen for breakfast. He demonstrates the use of his silverware, arranged on the table for his convenience, he says, “not according to Emily Post.”²²⁰ When eating, Leavy cuts his food with the knife in his left hook and the fork in his right, but he then rotates his plate so he can place the fork in his left hook and eat. His reason for this is the greater control he has over his left arm prosthetic hook since his left stump is longer. In fact, Leavy informs the audience he was right side-dominant

²²⁰ Ibid.

before his accident but had since become left side-dominant. Additionally, he grasps and lifts his coffee cup and then his glass of orange juice. This shows the strength and flexibility Leavy achieves with his prosthetics while simultaneously demonstrating the care and delicacy with which he handles fragile items, such as ceramic and glass.²²¹

Leavy then discusses his views on family adjustment to someone becoming an amputee. Leavy had been married to his wife, Pearl, for twenty years at the time of this production. He talks about her acceptance of his “quirks” he uses to complete daily tasks. While Leavy had been performing those tasks, the audience sees Pearl making the bed, then cooking breakfast, pouring coffee, serving the food to her husband, and clearing away the dishes. So, although Leavy had been able to dress and feed himself, the audience likely would not expect Leavy to engage in cooking, an activity culturally coded as “women’s work”; additionally, Leavy likely does not see cooking as a learning necessity since he has a wife. He also discusses family adjustment more generally.²²²

If this amputee goes home, he is an adult; he has a wife and children. First of all, he may have the type of wife who’s extremely sympathetic, so rather than see her poor husband struggle through this...fighting and struggling to do this job, she says, “No dear, let *me* do this. Let *me* cut your meat. Let *me* pamper him.” But she’s not doing it with the intention in mind of really pushing him down. She’s doing it from a motherly instinct, I think, that she wants to help this poor individual because she feels sorry for him, but...in feeling sorry for him this way, she’s making matters worse because she’s constantly there, you know, doing everything for you. Pretty soon you become just dependent.²²³

Just as women had been advised not to coddle their returning disabled World War II veterans, government-funded films still promoted these ideas of dependence and independence.

²²¹ Ibid.

²²² Ibid.

²²³ Ibid.

While providing this description of family adjustment, Leavy has read his newspaper, finished his coffee, and smoked a cigarette. His entire morning routine, from his alarm going off to walking out the front door for work, takes almost exactly thirty minutes. He spends the remaining twelve minutes of the film showing some of his work and leisure activities. One interesting anecdote included in the film involved Leavy's dog, P. J. While walking home from school with Leavy's youngest son, P. J. was hit by a car. The veterinarian called Leavy at work and told him the dog would have to be euthanized. Leavy asked why, to which the vet replied that P. J.'s leg had been crushed and would need to be amputated. Leavy instructed the vet to perform the amputation. The doctor said, "Jerry, you don't want a dog with one [*sic*] leg?" Leavy answered, "Well, gee doc, you should see what his master looks like, so get to amputating."²²⁴

²²⁴ Ibid.



Figure 4.10: Jerry Leavy drives his car using a steering wheel hook adapter, 1968. Source: Jerry Leavy.

As Leavy drives to work, the audience can see the steering wheel adaptation he uses to drive (Fig. 4.10). Although he can manage driving, he says, he often has trouble with tollbooths; in fact, once a tollbooth operator saw Leavy's metal hooks, mistook them for guns, and thought Leavy was attempting a hold-up! When he arrives at the office of prosthetics company A.J. Hosmer, Leavy further demonstrates the daily tasks he is able to perform, including opening mail, dialing and using a rotary phone, and writing purchase orders.



Figure 4.11 Jerry Leavy writes purchase orders while talking on the phone, 1968. Source: Jerry Leavy.

Leavy displayed a sense of humor by keeping a miniature statuette of *Venus de Milo* on his desk (see background of Fig. 4.11), claiming he would use it in an advertising campaign with the slogan “If only Hosmer had been in business then...”²²⁵ Finally, the film abruptly cuts from *Venus de Milo* to Leavy’s airplane on an airstrip. As discussed above, Leavy frequently piloted his own plane across the country and to various foreign countries to visit potential business clients. The flight in this film, however, is of a personal nature. Leavy and his wife are taking their three children on a weekend vacation to a nearby lake. This further reinforces the ideas of heterosexual masculinity to which men in postwar America aspired. The film ends with Leavy flying his plane combined with a photograph collage of the family.

²²⁵ Ibid.

All of these personal grooming techniques and daily routines show both the normality of completing these tasks as well as the normality a person presents to the outside world having completed them. Amputees often formed their own social networks, bonding with those who could relate to their situations. Seasoned amputees passed their informal training, or “tricks of the trade” as Leavy called them, down to the newer amputees. That information, along with the medical treatment and physical and occupational rehabilitation provided by the government allowed amputees to reenter civilian life and work towards regaining normality. All three of these films exhibited the government’s – and Americans’ – general ideas of normality. The three amputees were victims of accidents who worked hard to “overcome” their disability, adapted to their new bodies (including their prosthetics), gained employment, and adhered to the heterosexual gender roles laid out in postwar America.

CHAPTER 5

Conclusion

The American view of disability changed dramatically in the years immediately following World War II. This was particularly evident in the growing prosthetics field. Prosthetic limbs acted as symbols of both bodily reconstruction and competency that assisted in circumnavigating the emasculation commonly associated with disability. This symbolism had been true of prosthetics since the aftermath of the Civil War; however, scientific and material developments during World War II allowed for greater understanding of the ways in which bodies could be effectively rehabilitated and reintegrated into society.

Businesses, such as Northrop Aircraft, cooperated with the federal government in order to develop and provide the most efficient prosthetics, focusing on appearance, utility, weight, durability, noise, and texture.²²⁶ To address these issues, as discussed in Chapter Two, the Army and National Research Council created its Committee on Prosthetic Devices, through which Northrop received its first prosthetics contract.²²⁷ In addition to significant improvements in lower limb joints and split hook arms, Northrop provided vocational rehabilitation and paid employment – and, therefore, a chance at

²²⁶ Statement of Capt. Frank P. Kreuz, Medical Corps, Bureau of Medicine and Surgery, United States Navy, *Hearings before the Committee on Labor, Subcommittee on Aid to Physically Handicapped*, HR 45, A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes, Part 15, 79th Cong., 1st sess., September 11, 1945, 1586-1595

²²⁷ Bi-monthly Progress Report No. 2, July 15, 1945; Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

economic independence – through its “Department 99.”²²⁸ Patients could reconstruct their bodies while reasserting their masculinity by taking on wage work and reassuming the traditional role of male breadwinner.

The American public faced numerous anxieties caused by the war, and questions arose regarding the personhood, citizenship, and reintegration of amputees. Using analysis of war posters and the portrayal of amputees in Northrop’s prosthetics program, Chapter Three addressed these questions by focusing on the gender roles of wage earning (breadwinning) and veterans’ dependence on or independence from the government, friends, and family. The War Manpower Commission (WMC) and the Office of War Information (OWI) used several tactics in their advertising and propaganda imploring women to join the war industry workforce, including advertising equal pay, questioning women’s patriotism, encouraging spousal approval, and helping to end the war sooner.²²⁹ As much as women contributed to the war effort, however, it was generally assumed that when it was over, men would return to the jobs they had left, and women would return either to their homes or to previously held jobs in low-paying industries. For disabled veterans, the ideas of breadwinning and (in)dependence were inextricably linked. Physical and vocational rehabilitation played key roles in rebuilding men’s bodies and assuring the public of the possibility of veterans’ independence. Once again through the use of posters, the government conveyed two messages regarding its disabled veteran population: the first reminded Americans that soldiers were still in danger without their monetary help, and the second showed the value of disabled people as employees.

Chapter Three also discussed personhood and citizenship through the

²²⁸ “Northrop’s Vocational Therapy Program.”

²²⁹ Rupp, *Mobilizing Women for War*, 74–114.

participation of civilian amputee Jerry D. Leavy and military amputee Robert S. Allen in Northrop Aircraft's prosthetic programs. In its public reports, Northrop presented amputees as objects to be viewed, with terminology stripping them of nearly every potential role.²³⁰ However, according to Leavy, Northrop's participants frequently took an active, if largely uncredited, role, providing essential input as to the design and functionality of prosthetic limbs.²³¹ Amputees were seen more dynamically in other promotional and outreach materials. Leavy, Allen, and other amputees were expected to act as role models and encourage other amputees to resume their traditionally expected gender roles.

The ultimate goal for the government was to repair veteran amputees' bodies to "normal," an ambiguous term left open to interpretation. For the purposes of Chapter Four, "normal" referred to the dominant white, middle-class, heterosexual status quo and amputees' efforts to reach that status through "overcoming" their disability, adapting to new bodies (including prosthetics), gaining employment, and adhering to expected gender roles. The government found motion pictures to be an effective medium to spread information to a large audience,²³² and they targeted amputees with their funding of inspirational training videos featuring three individual bilateral arm amputees: Charles McGonegal, Harold Russell, and Jerry Leavy. Each man demonstrated how he was able to move past his disability, perform basic functions with his prosthetics (including brushing teeth, combing hair, and eating), discuss or show their means of employment, and assure the audience of their romantic and family lives. These films allowed

²³⁰ Motis, *Contractor's Final Report*.

²³¹ Jerry D. Leavy, telephone interview by author, June 5, 2014.

²³² Pautz, "The Decline in Average Weekly Cinema Attendance, 1930-2000."

“seasoned” amputees to pass down the “tricks of the trade” they had learned to successfully reintegrate themselves into the status quo the government was attempting to promote in the years following the end of World War II.

In the years since World War II, prosthetics have continued to improve and attitudes have continued to shift. Conflicts such as the Korean War, Vietnam War, and the wars in Iraq and Afghanistan combined with ever-increasing medical care meant that soldiers’ mortality rate continued to decrease, but the surviving wounded often needed some type of prosthesis. One of the most notable improvements in upper-extremity prosthetics is the myoelectric prosthesis, which is “an externally powered artificial limb that [amputees] control with the electrical signals generated naturally by [the amputees’] own muscles.”²³³ Funding for these prosthetics comes from the government’s Defense Advanced Research Projects Agency (DARPA), which is responsible for the development of emerging technologies for use by the military. Myoelectric prosthetic arms attempt to combine form *and* function by resembling a “normal” hand and moving each individual finger for better hold and control (Fig. 5.1).

²³³ “Myoelectric Prosthetics 101,” *Ottobock USA*, accessed March 6, 2016, ottobockus.com/prosthetics/info-for-new-amputees/prosthetics-101/myoelectric-prosthetics-101/.

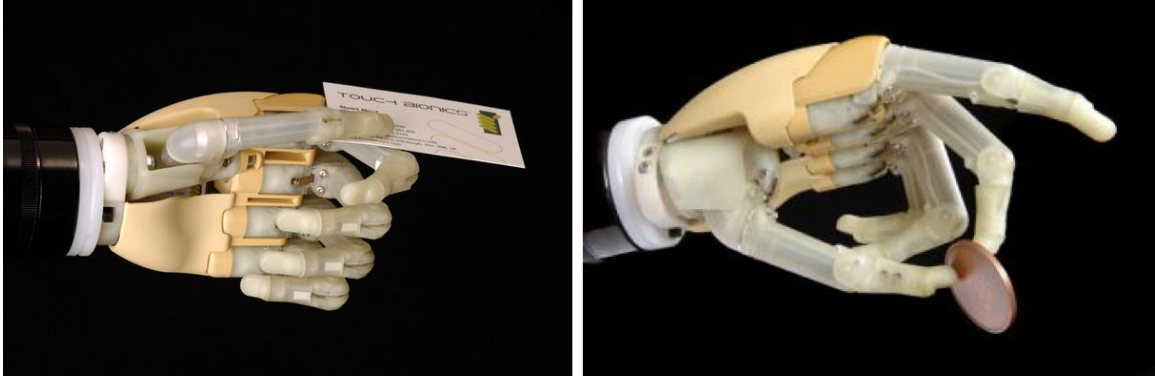


Figure 5.1: Myoelectric Hand grasping a business card (left) and a coin (right). Source: University of California-Irvine.²³⁴

Although not related to veterans, perhaps the most notable development – in both prosthetics and attitudes – involved the legs used by bilateral leg amputee Oscar Pistorius in the 2012 Olympics and Paralympics in London. He encountered some controversy surrounding his request to participate in both competitions with his Flex-Foot Cheetah carbon fiber legs, or “blades” (see Figure 5.2). He was deemed eligible for the Paralympics; however, the International Association of Athletics Federations (IAAF) ruled him ineligible for the Olympics because his prosthetic legs would give him an unfair *advantage* in the Olympics against “normal” runners.

²³⁴ “Myoelectric Prosthesis,” *Types of Prosthesis*, accessed March 6, 2016, bme240.eng.uci.edu/students/10s/slam5/types.html.



Figure 5.2: Alan Oliveira (left) of Brazil and Oscar Pistorius (right) of South Africa compete in the Men's 200m Final at the 2012 Paralympics in London. Source: The Guardian.²³⁵

Pistorius appealed, and research teams offered to either prove or disprove the IAAF's ruling. The Cheetah's research and development team described the leg's operation as that of a spring, compressing at impact and then rebounding off the ground. A German team reported this allowed Pistorius to run using twenty-five percent less energy than his able-bodied competitors. However, an extensive study by a scientific team at Rice University including physiologists, biomechanics, and biophysicists – one of whom was a double amputee himself – disproved the German study and concluded Pistorius was “physiologically similar but mechanically dissimilar to someone running with intact legs.”²³⁶ For example, he used oxygen at the same levels and in the same way as other

²³⁵ Owen Gibson, “Paralympics 2012: Oscar Pistorius Erupts after Alan Oliveira Wins Gold,” *The Guardian*, September 2, 2012, Accessed March 6, 2016, theguardian.com/sport/2012/sep/03/paralympics-2012-oscar-pistorius-alan-oliveira.

²³⁶ Rose Eveleth, “Should Oscar Pistorius's Prosthetic Legs Disqualify Him from the Olympics?,” *Scientific American*, July 24, 2012, Accessed February 9, 2015,

runners, but his body moved differently. Unfortunately, experts could not (and cannot) agree on what “physiologically similar” and “mechanically dissimilar” meant in the context of Olympic-level running. Pistorius did become the first double amputee to compete in the 2012 Olympics, finishing last in his semi-final. The Paralympics had its own controversy involving Pistorius when he accused fellow Paralympian Alan Oliveira of defeating him by using blades that were too long, giving Oliveira the unfair advantage of a longer stride (Fig. 5.2). Officials ruled, however, that Oliveira’s blades fell within regulation lengths.²³⁷

It seems the American public’s attitudes toward amputees and prosthetics oscillate between believing amputees are either inferior or superior. An amputee is either an incomplete person needing to be made whole, or a superhuman capable of exceeding humans in speed, strength, and endurance. Prosthetic developments in science fiction and fantasy may be nearing reality; indeed, a DARPA-funded “Luke Skywalker” hand is in the works.²³⁸ This interaction and integration of the body and technology is simultaneously the wave of the future and an echo of the past. This process ties bodily performance – now as an athlete as well as a worker – to citizenship, just as it did seventy years ago with the inception of government-funded prosthetics programs.

scientificamerican.com/article/scientists-debate-oscar-pistorius-prosthetic-legs-disqualify-him-olympics/.

²³⁷ Gibson, “Paralympics 2012.”

²³⁸ “The DEKA Arm,” *DEKA*, accessed March 6, 2016, dekaresearch.com/deka_arm.shtml.

BIBLIOGRAPHY

PRIMARY

Archives

Compilation of Laws, Decisions, and Instructions Dated 1862 to 1892 Pertaining to the Settlement Claims for Prosthetic Appliances and Commutations; Preliminary inventory of Records of the Veterans Administration Pertaining to the Issuance of Artificial Limbs, Trusses, and Other Prosthetic Appliances, 1862-1935; Records of the Veterans Administration, Record Group 15; National Archives Building, Washington D.C.

Letters Sent Relating to Prosthetic Appliances, Commutation, and Transportation Reimbursement, Sept. 1885-Feb. 1892; Preliminary inventory of Records of the Veterans Administration Pertaining to the Issuance of Artificial Limbs, Trusses, and Other Prosthetic Appliances, 1862-1935; Records of the Veterans Administration, Record Group 15; National Archives Building, Washington D.C.

Office of Scientific Research and Development, Committee on Medical Research, Contractors Reports, 1940-1947; National Academy of Sciences, OEMcmr-522; Records of the Office of Scientific Research and Development [OSRD], Record Group 227; National Archives at College Park, Maryland.

Films

Controls Training for the Bilateral Amputee. 16mm color. San Jose State College, 1968.

Diary of a Sergeant. War Department, 1945. <https://youtu.be/I4ryvwZin74>.

Meet Jerry Leavy. 16mm color. San Jose State College, 1968.

Meet McGonegal. War Department, 1944. https://youtu.be/FSLj5_HgYlo.

Government Reports and Legislation

An Act to Amend an Act entitled "An Act to Authorize the Establishment of a Bureau of War Risk Insurance in the Treasury Department," Approved September Second, Nineteen Hundred and Fourteen, and for Other Purposes, Chapter 105, 65th Congress, 1st sess. (October 6, 1917). An Act to Provide for Furnishing Artificial Limbs to Disabled Soldiers, Chapter CXXXII, 41st Congress, 2d sess. (June 17, 1870).

An Act to Authorize the Establishment of a Bureau of War Risk Insurance in the Treasury Department, Chapter 293, 63rd Congress, 2d sess. (September 2, 1914).

An Act to Provide for Persons Who were Disabled by Known Wounds Received in the Revolutionary War, Chapter XXV, 9th Congress, 1st sess. (April 10, 1806).

Motis, Gilbert M. *Contractor's Final Report on Artificial Arm and Leg Research and Development, Covering the Period January 2, 1945 to December 31, 1950*. Hawthorne, CA: Northrop Aircraft, Inc., 1951.

Committee on Artificial Limbs of the National Research Council, *Terminal Research Reports on Artificial Limbs, Covering the Period April 1, 1945 through June 30, 1947*, Washington, D.C.

US Congress. House. A Resolution authorizing the Committee on Labor to conduct an Investigation of the Extent and Character of Aid now given by the Federal, State, and Local Governments and Private Agencies to the Physically Handicapped, and for Other Purposes. 79th Cong., 1st sess., September 11-13, 19-20, 25, October 12, and November 20, 1945.

Newspapers, Journal Articles, and Books

Allen, Robert S. "Gen. Lee's High Living Faces Probe." *The Washington Post*, August 14, 1947.

"Col. Allen to Speak on Wounded Veterans." *The Washington Post*, November 19, 1945.

"Col. Robert S. Allen Captive of Nazis for Only 3 Days." *The Washington Post*, April 25, 1945.

"Dedication by Surgeon General W. C. Gorgas." *Carry On: A Magazine on the Reconstruction of Disabled Soldiers and Sailors* 1, no. 1 (June 1918): 3.

"Inflation Will Hit Veterans First, Says Col. Robert Allen." *The Washington Post*, October 21, 1946.

"Kids Pray and Pal Mends." *Beatrice Daily Sun*. June 27, 1939.

Leavy, Jerry D. "Follow Up," January 24, 2016.

———. *It Can Be Done: An Upper Extremity Amputee Training Handbook*. Quincy, CA: Feather Publishing, 1978.

———. Interview by Virginia Pickel. Telephone, June 5, 2014.

- Marks, A. A. "Advertisement: 'Our Business Record!'" *The Railway Surgeon* 3, no. 25 (May 4, 1897). <http://railwaysurgery.org/Limbs.htm>.
- McGonegal, Charles C. "How I Get Along without Hands." *Saturday Evening Post*, November 25, 1944.
- "Northrop's Vocational Therapy Program." *Aero Digest* 46 (August 1944): 56–57 & 126.
- "Northrop to Open Airplane Factory for Battle Craft." *The Bakersfield Californian*. June 20, 1939.
- Palmer, Benjamin Franklin. Artificial Leg. United States Patent & Trademark Office 4834. Meredith, NH, issued November 4, 1846.
- Pearson, Drew. "Washington Merry-Go-Round: Poor Wooden Legs." *The Daily Mail*. February 10, 1945.
- "Robert Allen Reports: How Columnist Got That Way." *The Abilene Reporter-News*. October 7, 1954.
- Russell, Harold. *Victory in My Hands*. New York: Creative Age Press, 1949.
- Russell, Harold, and Dan Ferullo. *The Best Years of My Life*. Middlebury, VT: P. S. Eriksson, 1981.
- "The Carnes Arm Puts You Back on the Payroll!," c 1939.
- "Three Men with Four Limbs and Three Smiles." *Alice Daily Echo*. 1951.

SECONDARY

- "Above-Knee Sockets and Methods of Suspension." *Digital Resource Foundation for the Orthotics and Prosthetics Community: Virtual Library Project*. Accessed December 6, 2015. oandplibrary.org/popup.asp?frmItemId=1736E46F-EA70-42D4-9183-2A9D3315B46D&frmType=image&frmId=43.
- Bergan, Ronald. "Obituary: Harold Russell, 1914-2002." *The Guardian*. February 5, 2002. theguardian.com/news/2002/feb/06/guardianobituaries.
- Carter, Julian B. *The Heart of Whiteness: Normal Sexuality and Race in America, 1880-1940*. Durham: Duke University Press, 2007.
- "Civil War Casualties - The Cost of War: Killed, Wounded, Captured, and Missing." *Civil War Trust*. Accessed March 9, 2015. <http://www.civilwar.org/education/civil-war-casualties.html>.

- Cohen, Wilbur J. "The New Deal and Its Legacy: The Development of the Social Security Act of 1935: Reflection Some Fifty Years Later." *Minnesota Law Review* 68, no. 2 (December 1983): 379.
- Cornell, Caroline. "The Housewife's Battle on the Home Front: Women in World War II Advertisements." *The Forum: Journal of History* 2, no. 1 (2010): 28–42.
- Creadick, Anna G. "Keeping Up Appearances: 'Normality' in Postwar U.S. Culture, 1945-1963." PhD diss., University of Massachusetts Amherst, 2002.
- Davis, Lennard J. "Disability: The Next Wave or Twilight of the Gods?" *PMLA* 120, no. 2 (March 2005): 527–32.
- de la Peña, Carolyn Thomas. *The Body Electric: How Strange Machines Built the Modern American*. New York: New York University Press, 2003.
- Douglas, Paul H. "The War Risk Insurance Act." *Journal of Political Economy* 26, no. 5 (May 5, 1918): 461–83.
- "Drew Pearson, American Journalist." *Encyclopedia Britannica*. Accessed January 31, 2016. britannica.com/biography/Drew-Pearson#ref96771.
- Dye, Harold B. "Veteran Placement as Viewed by an Industrial Physician." *The Journal of Industrial Health, Occupational Diseases, and Traumatic Surgery* 13, no. 12 (December 1944): 989–90.
- Eveleth, Rose. "Should Oscar Pistorius's Prosthetic Legs Disqualify Him from the Olympics?" *Scientific American*, July 24, 2012. scientificamerican.com/article/scientists-debate-oscar-pistorius-prosthetic-legs-disqualify-him-olympics/.
- Federal Board for Vocational Education. "The Most Wounded Private." *The Vocational Summary* IV, no. 1 (May 1921): 6–7.
- Gerber, David. "Anger and Affability: The Rise and Representation of a Repertory of Self-Presentation Skills in a World War II Disabled Veteran." *Journal of Social History* 27, no. 1 (Autumn 1993): 5–27.
- Gerber, David A. "Disabled Veterans, the State, and the Experience of Disability in Western Societies, 1914-1950." *Journal of Social History* 36, no. 4 (Summer 2003): 899–916.

- Gerber, David A. "Heroes and Misfits: The Troubled Social Reintegration of Disabled Veterans in *The Best Years of Our Lives*." In *Disabled Veterans in History*, edited by David A. Gerber, 70-95. Ann Arbor: University of Michigan Press, 2012.
- Gibson, Owen. "Paralympics 2012: Oscar Pistorius Erupts after Alan Oliveira Wins Gold." *The Guardian*, September 2, 2012.
theguardian.com/sport/2012/sep/03/paralympics-2012-oscar-pistorius-alan-oliveira.
- Hancock, J. Duffy. "The Evolution of Artificial Limbs," 1929.
- Hartmann, Susan M. "Prescriptions for Penelope: Literature on Women's Obligations to Returning World War II Veterans." *Women's Studies* 5 (1978): 223-39.
- Hasegawa, Guy R. *Mending Broken Soldiers: The Union and Confederate Programs to Supply Artificial Limbs*. Carbondale: Southern Illinois University Press, 2012.
- Honey, Maureen. "The 'Womanpower' Campaign: Advertising and Recruitment Propaganda during World War II." *Frontiers: A Journal of Women Studies* 6, no. 1/2 (Spring/Summer 1981): 50-56.
- "Jack Northrop: A Visionary's Bittersweet Legacy." *Northrop Grumman*. Accessed November 8, 2015.
<http://www.northropgrumman.com/AboutUs/OurHeritage/OurFounders/JackNorthrop/Pages/default.aspx>.
- Jennings, Audra. "'An Emblem of Distinction': The Politics of Disability Entitlement, 1940-1950." In *Veterans' Policies, Veterans' Politics: New Perspectives on Veterans in the Modern United States*, edited by Stephen R. Ortiz, 94-116. Gainesville: University Press of Florida, 2012.
- . "Engendering and Regendering Disability: Gender and Disability Activism in Postwar America." In *Disability Histories*, edited by Susan Burch and Michael Rembis, 345-63. Urbana: University of Illinois Press, 2014.
- Kennedy, David M. *Freedom from Fear: The American People in Depression and War, 1929-1945*. New York: Oxford University Press, 1999.
- Kessler-Harris, Alice. *In Pursuit of Equity: Women, Men, and the Quest for Economic Citizenship in 20th Century America*. New York: Oxford University Press, 2001.
- . *Out to Work: A History of Wage-Earning Women in the United States*. New York: Oxford University Press, 2003.
- Kinder, John M. *Paying with Their Bodies: American War and the Problem of the Disabled Veteran*. Chicago: The University of Chicago Press, 2015.

- Klein, Jennifer. *For All These Rights: Business, Labor, and the Shaping of America's Public-Private Welfare State*. Princeton, NJ: Princeton University Press, 2006.
- Kozol, Wendy. *Life's America: Family and Nation in Postwar Journalism* (Philadelphia, PA: Temple University Press, 1994): 14. Quoted in Anna G. Creadick, "Keeping Up Appearances: 'Normality' in Postwar U.S. Culture, 1945-1963." PhD diss., University of Massachusetts Amherst, 2002.
- Linker, Beth. "On the Borderland of Medical and Disability History: A Survey of the Fields." *Bulletin of the History of Medicine* 87, no. 4 (Winter 2013): 499–535.
- Longmore, Paul K. "Uncovering the Hidden History of Disabled People." In *Why I Burned My Book and Other Essays on Disability*, 41-52. Philadelphia, PA: Temple University Press, 2003.
- Michel, Sonja. "Danger on the Home Front: Motherhood, Sexuality, and Disabled Veterans in American Postwar Films." *Journal of the History of Sexuality* 3, no. 1 (July 1992): 109–28.
- "Myoelectric Prosthesis." *Types of Prosthesis*. Accessed March 6, 2016. bme240.eng.uci.edu/students/10s/slam5/types.html.
- "Myoelectric Prosthetics 101." *Ottobock USA*. Accessed March 6, 2016. ottobockus.com/prosthetics/info-for-new-amputees/prosthetics-101/myoelectric-prosthetics-101/.
- Nelson, Barbara J. "The Gender, Race, and Class Origins of Early Welfare Policy and the Welfare State: A Comparison of Workmen's Compensation and Mothers' Aid." In *Women, Politics, and Change*, edited by Louise A. Tilly and Patricia Gurin, 413–35. New York: Russell Sage Foundation, 1990.
- Nielsen, Kim E. *A Disability History of the United States*. Boston, MA: Beacon Press, 2012.
- "Obituary: Robert S. Allen, Political Columnist." *New York Times*. February 25, 1981.
- Ott, Katherine. "Disability Things: Material Culture and American Disability History, 1700-2010." In *Disability Histories*, edited by Susan Burch and Michael Rembis, 119-135. Urbana: University of Illinois Press, 2014.
- . "Carnage Remembered: Prosthetics in the US Military since the 1860s." In *Materializing the Military*, edited by Bernard Finn and Barton C. Hacker, 47-64. London: Science Museum, 2005.

- “Overview for Films in World War II.” *University of Houston Digital History*. Accessed February 15, 2016. digitalhistory.uh.edu/disp_film.cfm?mediatypeid=1&eraid=15&psid=2962.
- Pautz, Michelle C. “The Decline in Average Weekly Cinema Attendance, 1930-2000.” *Issues in Political Economy* 11 (Summer 2002): 54–65.
- Putnam, Robert D. *Bowling Alone: The Collapse and Revival of American Community*. New York, NY: Simon & Schuster, 2001.
- Rupp, Leila J. *Mobilizing Women for War: German and American Propaganda, 1939-1945*. Princeton, NJ: Princeton University Press, 1978.
- Serlin, David. *Replaceable You: Engineering the Body in Postwar America*. Chicago: University of Chicago Press, 2004.
- Smit, Gerwin, Raoul M. Bongers, Corry K. Van der Sluis, and Dick H. Plettenburg. “Efficiency of Voluntary Opening Hand and Hook Prosthetic Devices: 24 Years of Development?” *Journal of Rehabilitation Research and Development* 49, no. 4 (2012): 523–34.
- “Take a Closer Look at War Bonds.” *The National World War II Museum*. Accessed February 6, 2016. nationalww2museum.org/learn/education/for-students/ww2-history/take-a-closer-look/war-bonds.html.
- “The DEKA Arm.” *DEKA*. Accessed March 6, 2016. dekaresearch.com/deka_arm.shtml.
- “The Human Machinery of War: Disability on the Front Lines and the Factory Floor, 1941-1945.” *Ohio State University Department of History*. Accessed November 14, 2015. ehistory.osu.edu/exhibitions/machinery/index.
- Welke, Barbara Young. *Law and the Borders of Belonging in the Long Nineteenth Century United States*. New Histories of American Law. New York: Cambridge University Press, 2010.
- Wilson, Jr., A. B. “The Role of the Committee on Prosthetics Research and Development and the Committee on Prosthetic-Orthotic Education.” *Bulletin of Prosthetics Research*, no. Fall (1974): 478–86.
- Witkin, Richard. “John Knudsen Northrop, Aviation Design Pioneer, Dies.” *New York Times*, February 20, 1981.
- Woods, Kristin. “‘It Can Be Done’: Jerry Leavy Has Turned Tragedy into Success.” *Chester Progressive*. February 22, 1995.
- “Wounded Busy on Plane Parts in Hospital.” *Joplin News-Herald*. August 23, 1944.

Wrobel, Katharine. "Law and the Borders of Belonging in the Long Nineteenth Century United States." *Canadian Woman Studies* 29, no. 3 (Spring/Summer 2012): 192–93.