

Reducing Barriers to Online Access for People with Disabilities

The Internet is not living up to its enormous potential to enhance and broaden the lives of persons with disabilities. Closing policy loopholes and enforcing existing rules would make a world of difference.

As ever more education, employment, communication, entertainment, civic participation, and government functions move primarily or exclusively online, the high levels of inaccessibility on the Web and in Internet-enabled mobile technologies threaten to make people with disabilities into the second-class citizens of the information society. Unless the policy approach toward Internet accessibility for people with disabilities is reconceptualized for the current social and technological realities, people with disabilities will face exclusion from every core element of society.

In the United States, people with disabilities are the largest minority group. Some 54.4 million people, or 18.7% of the population, have a disability. This number will increase rapidly as the baby boom generation ages, because 53% of persons over 75 have a disability.

People with disabilities already face significant challenges

in employment and education. Persons with disabilities face unemployment at more than three times higher levels than the rest of the population and suffer similar gaps in educational attainment. Yet 75% of people with disabilities who are not employed want to work. Only 30% of high-school graduates with disabilities enroll in college, as compared with 40% of the general population. One year after high-school graduation, only 10% of students with disabilities are enrolled in two-year colleges, and a paltry 5% are enrolled in four-year colleges.

Despite the fact that the United States has the world's most comprehensive policy for Internet accessibility and that clear guidance for creating accessible technologies already exists, designers and developers of Web software and hardware technologies in industry, academia, and government often exploit holes in existing policy to ignore the needs of people with disabilities. As a result, most Internet-related technologies are born inaccessible, cutting out some or all users with disabilities.

John Dugdale

John Dugdale pays homage through his work to notable 19th century photographers such as Sir John Herschel, Henry Fox Talbot, and Julia Margaret Cameron, who utilized the then-new photographic processes to capture real and imagined tableaux from their surroundings. As Dugdale says about these old masters and pioneers of photography, "Friends, family, and personal belongings were recorded with great joy, myths were illustrated, nature was tamed, and the passage of a day is still a palpable reality in these brilliant first photographs. These free spirits are my heroes and the inspiration for my own work." The invention of photography for them provided a new perspective and a new way of seeing and recording.

When Dugdale, who was a successful fashion and commercial photographer, began to lose his sight to cytomegalovirus retinitis (he is blind in one eye and has very limited vision in the other), he turned to early photographic processes in

People with disabilities use the Internet and related technologies at levels well below those of the rest of the population. The main reason for this is not a lack of interest or education, but that the Internet is inherently unfriendly to many different kinds of disabilities. These barriers to access and usage vary by type and extent of disability. Since the advent of the World Wide Web, study after study has demonstrated the inaccessibility of Web sites and other elements of the Internet. Recent studies of the accessibility of U.S. government Web sites, for example, have found that at least 90% of the sites have major access barriers, even though they are supposed to have been accessible for nearly a decade under the law. The levels of accessibility in commerce and educational settings are even worse. The failure of the current policy approach can be seen in the results of these studies.

Challenging interfaces

People of differing abilities obviously face different challenges in accessing the Internet. Persons with visual impairments can face challenges in the lack of compatibility of Web content with screen readers, which are software applications that provide computer-synthesized speech output of what appears on the screen, as well as equivalent text provided in the back-end code. Screen-reader users typically have problems when designers fail to put appropriate text tags on graphics, links, forms, or tables. For persons with motor impairments, such as limited or no use of fingers or hands, the barriers are created by cluttered layout, buttons and links that are too small, and other important naviga-

order to pursue a fine art career. With the assistance of family and friends, Dugdale creates cyanotypes, a photographic process first created in 1842 by Sir John Herschel and used in engineering circles well into the 20th century as a simple way to reproduce their work. By returning to early processes, Dugdale, like his predecessors, discovered a new way of "seeing."

Directing his lens at the ordinary objects and scenes of everyday life, Dugdale uses photography to make the ordinary appear extraordinary. And in a sense he is reversing the original photographic experience. Rather than capturing an external image so that it can be remembered and shared, Dugdale is projecting images that exist in his mind but that he no longer sees physically.

Images courtesy of Holden Luntz Gallery.

bility considerations (such as requiring the use of a pointing device) that can render entire sites and functions unusable. For persons with hearing impairments, the lack of textual equivalents of audio content can cut off large portions of the content of a site, and interactive Web chats and other conferencing features may be impossible. People with speech and communication impairments can also be excluded from interactive Web chats and other conferencing features. For persons with cognitive impairments, such as autism, dementia, or traumatic brain injury, issues of design, layout, and navigability are the difference between being able to use a site and not being able to use it. People with specific learning disabilities, depending on their nature, may face the same barriers as people with visual impairments or people with cognitive impairments. For people with seizure disorders, rates of flickering and flash can jeopardize their health.

Experiences with the Internet often vary by type of disability. The same Web site often offers opportunities for one group and excludes another. Consider Web-based distance education. A student who uses a wheelchair may find that being able to take courses online makes education much easier. But if the course Web site is not designed to be accessible for students with limited mobility in their hands, participation in the course may be limited or impossible. Similarly, a Web-enabled mobile device with a touch screen may seem like a miracle to a user with a hearing impairment and a nightmare to a user with a visual impairment, if it is not designed to provide alternative methods for interactions. Therefore, the Internet and related technologies present a com-



JOHN DUGDALE, *Spectacle*, Toned silver gelatin print, 20 x 16 inches, 1999.



JOHN DUGDALE, *Music Glass*, Cyanotype, 8 x 10 inches, 1994.

An accessible Internet holds enormous potential to heighten the inclusion of people with disabilities, facilitating telework, online education, participation in e-government, and formation of relationships that overcome barriers and challenges in the physical world.

plex set of problems for persons with disabilities, both as a larger population and as separate populations according to type of disability.

Although the range of potential barriers to persons with disabilities in the online environment is extensive, there are ways to develop and implement technologies so that persons with disabilities are included. There are known and achievable means to address the access barriers listed above. However, many developers of Web sites and related new technologies simply do not consider persons with disabilities when they create or update products. Yet the inaccessible Web sites and technologies that result from this disregard of accessibility run afoul of federal civil rights laws for persons with disabilities. Many of the issues of inclusion and exclusion online for persons with disabilities have been considered in law and policy, but the conceptions of disability under the law, exemptions from compliance, limited enforcement, and the inability of the law to keep pace with technological development all hinder the impact that the laws have had thus far.

Despite all of these barriers, the Internet has been justifiably viewed as having enormous potential for promoting social inclusion for persons with disabilities. In 2000, people with disabilities who were able to access and use the Internet were already reporting notably larger benefits from the Internet in some areas than was the general population. Adults with disabilities in 2000 were more likely to believe that the Internet improved the quality of their lives (48% to 27%), made them better informed about the world (52% to 39%), helped them meet people with similar interests and experiences (42% to 30%), and gave them more connections to the world (44% to 38%) than the general population. Currently, some Internet technologies are a significant benefit to people with specific types of disabilities, whereas others offer potential opportunities to all persons with disabilities.

Smartphones, although excluding many other persons with disabilities, have been a boon for those with hearing, speech, or other types of communication impairments, who

can now use the phones to communicate face-to-face much more efficiently than they previously could. Similarly, with video chat, these same individuals can now carry on conversations over the phone in new ways. For the broader populations of people with disabilities, the Internet has a great deal of potential to create new means of communication and interaction through online communities devoted to particular types of disabilities. People who might never encounter someone with a similar disability in their physical environment can now interact directly with people with similar conditions worldwide. For people whose disabilities limit their ability to leave their homes, the Internet has the potential to provide a far greater world of interaction. People with disabilities even have the option to choose to live their online lives as people without disabilities, if they so wish.

Beyond the clear potential socialization and communication benefits, the Internet offers an enormous array of new ways to pursue education and employment. For people who might find it very difficult or even impossible to travel to a building for work or school, the Internet provides the ability to work or take classes from home. These potential benefits might be the greatest benefits in the long term for promoting social inclusion of persons with disabilities, given that the current levels of employment and education for persons with disabilities are catastrophically low as compared with the rest of the population.

Based on the importance of all of these types of engagement with the technology, the lack of equal access to the Internet will become an even more serious problem in the future. As more activities in the areas of communication, employment, education, and civic participation move primarily and then exclusively online, the effects of unequal access on persons with disabilities will multiply and mushroom. As more functions are available exclusively online (for example, if taxes can be filed only online and the tax Web site is inaccessible), individuals with disabilities are placed in an untenable situation. Inaccessible online education alone could seriously erode the ability of people with disabilities to have a place in society. Yet the virtual world is currently extend-

ing the comprehensive physical exclusions of the past.

The extreme irony of the situation is that an accessible Internet holds enormous potential to heighten the inclusion of people with disabilities, facilitating telework, online education, participation in e-government, and the formation of relationships that overcome barriers and challenges in the physical world. We must create a new approach to public policy that will better eliminate the virtual barriers that have been built, ensuring that people with disabilities are not marginalized by society.

The reasons for online inaccessibility

What does it mean to have an accessible interface? In the technology world, it means that your computer interface will work for people with disabilities, many of whom use an assistive technology to access software, operating systems, and Web sites. Commonly used assistive technologies include a screen reader, which provides computer-synthesized speech output of what appears on the screen; speech recognition, which allows for hands-free input; and various alternative keyboards and pointing devices.

Guidelines from nongovernmental organizations provide concrete technical specifications explaining how to build accessible interfaces. Most Web accessibility regulations around the world, including those in the United States, are based on the Web Content Accessibility Guidelines, a set of standards from the World Wide Web Consortium.

Despite the existence of assistive devices and accessibility guidelines, if a Web site is not designed in a manner that it is flexible enough to work with various assistive devices, there is nothing that the user can do that will lead to successful use of the site. It's not a matter of a user with a disability upgrading to a new version of software or purchasing a new hardware device. If a Web site isn't designed for accessibility, no action on the user's side will make interaction successful.

Yet the technical solutions are easy. They don't involve any type of advanced coding. They generally involve adding appropriate markup, such as using good descriptive text to describe graphics, table columns, forms, and links. These solutions are the responsibility of Web site developers, designers, and Webmasters. No additional technical expertise is needed, just an awareness of the need to provide appropriate labels.

At first glance, an accessible Web site won't look any different from an inaccessible one. An accessible Web page is simply a well-coded Web page, or as one federal web manager told us, "the same coding techniques that make a Web page accessible also help with search engine optimization, because all of that markup helps search engines find and



JOHN DUGDALE, *Houston Magnolia*, Toned silver gelatin print, 20 x 16 inches, 1996.

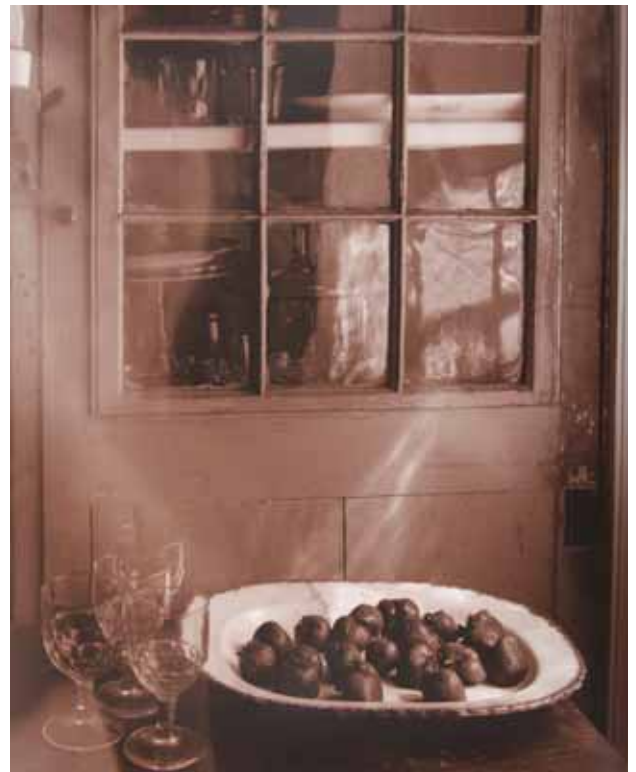
properly classify your Web page.”

When a Web site is designed to be accessible from the beginning, there are no additional costs involved. If a Web site has already been designed, the amount of time and money required to retrofit it for accessibility depend on the size and technical nature of the site. Obviously, adding more textual labels will take a greater amount of time, depending on the number of static Web pages that must be edited. If a Web site uses a content management system, often the page templates can be edited very quickly, so that the page layout itself is accessible. Then, it's only up to the content developers to make sure that they have labeled their pictures and provided closed-captioning or a transcript on multimedia. If a Web site is designed using inherently accessible technology such as HTML, the time and costs to make the site accessible should be limited. If a site is designed using an inherently inaccessible technology, such as a site built entirely in Flash, more time and expense will be required to it make it accessible.

Although all people with disabilities may be affected by inaccessible Web sites, those who are blind or have low vision are often the most affected. Computer interfaces are still primarily visual, and when the nonvisual equivalents are not coded properly, blind or low-vision individuals may have access to none of the content. Individuals with hearing impairments can access most content, except for the audio, when developers don't provide transcripts or captioning. Individuals with motor impairments, who may be unable to use standard keyboards or mice, may have trouble interacting with Web sites that provide content that is reachable only via pointing devices. Many of the design features that help blind users also help people with motor impairments, because making a Web site user-friendly for the blind means making sure that all content can be accessed via a keyboard, which is also what is needed by people with motor impairments. There is still relatively little research on Web accessibility for people with cognitive impairments, with the small body of literature indicating differing types of effects based on different cognitive impairments. Reflecting this lower level of attention, U.S. regulations have not included guidelines that meaningfully address cognitive impairments.

Government obstacles

Today, people with disabilities cannot access much of the information on federal Web sites that is available to those without disabilities. For example, in October 2010, some content on the Web site at ready.gov, which provides emergency readiness information, was inaccessible, meaning that blind people could not access the information about hurri-



JOHN DUGDALE, *Scarlet Berries*, Toned silver gelatin print, 20 x 16 inches, 1999.

cane preparedness and were not even aware that the information is there. Web sites that offer information about government loans and jobs are also inaccessible. Many federal Web sites state that users with disabilities should contact them if they have any problems accessing content, but then the online contact forms are themselves inaccessible.

These accessibility problems exist despite the fact that the federal government has pursued a robust legal program to promote equal online access through Section 508 of the Rehabilitation Act, the Americans with Disabilities Act (ADA), the E-government Act, the Telecommunications Act of 1996, and other related laws. These laws create the most comprehensive legislative approach to accessibility in the world. U.S. law focuses on the civil rights aspects of disability, which emphasize the ways in which society can better allow individuals with disabilities to function. Following the lead of the federal government, many states have also passed accessibility laws, such as Maryland's Information Technology Nonvisual Access law and California's Information Technology Accessibility Policy.

However, compliance with and enforcement of these laws have not been very effective. A recent study found that more than 90% of federal home pages were not in compliance with Section 508. Although the Justice Department has responsibility for collecting data from federal agencies on compliance every two years, it has not collected any data since 2003. The section508.gov Web site, which is managed by the General Services Administration, was redesigned in the summer of 2010, but the new version is not in compliance with Section 508. For instance, the feedback form has form fields that are not labeled properly, so that although the form looks normal to a user who can see, a user who is blind cannot determine what each form field is supposed to represent.

Each federal agency has someone in charge of compliance with 508, and the names are available on the section508.gov Web site. But that apparently has had no impact on actual compliance. Federal Web sites are not required to have an accessibility policy statement, and when they do, the statements often provide no more information than "we are compliant with Section 508" and even offer misleading information. Many states have regulations similar to Section 508 that address state government Web sites, but compliance and enforcement are often nonexistent at the state level.

In addition to the fact that no government agency is in charge of accessibility, there are several other barriers to compliance and enforcement with accessibility laws. People with disabilities have the responsibility to monitor acces-

sibility and bring complaints and claims against agencies and companies that violate accessibility laws. This approach puts the burden on people with disabilities to enforce their own rights in a way that no other minority or traditionally disadvantaged group is asked to do. Even when people with disabilities are able to successfully make accessibility claims, they usually do not succeed. Under all of the disability laws, public and private entities can claim that the requested accommodation is not financially or practically reasonable and therefore is an "undue burden" under the law, meaning that the entity does not need to provide the accommodation because it represents too much effort in terms of time or cost. A final major problem is that the laws focus on the technologies, not the users of the technologies or the reasons why people use the technologies. Without a clear focus on the information and communication needs of the users with disabilities, the laws will permanently be far behind the current technologies.

The legal situation for private Web sites is even less clear. The courts in their interpretations of accessibility laws have sometimes created additional barriers to accessibility enforcement, often because of a limited understanding of the Internet and of accessibility. This problem is amply demonstrated by a federal district court opinion relating to the ADA—*National Federation of the Blind v. Target*, 2006—that found that the Target Web site, because it was closely integrated with physical stores, could be seen as being legally required to be accessible because of this nexus. However, the same opinion explicitly limited the holding to companies with an online presence that is closely integrated with a physical presence. As such, the current case law says that Target must have an accessible Web site, but Amazon.com, Priceline.com, and Overstock.com may not need to worry about accessibility. It also implies that a company can have both physical and online presences—with the online presence being inaccessible—so long as the Web site is not tightly integrated with the physical presence. Although technology companies have started to include accessibility features more consistently in mainline operating systems and devices, such as Microsoft Windows 7 and the Apple iPad, those are designed to be used by millions of users, and they have the benefit of the large number of accessibility and usability experts at Microsoft and Apple. For instance, text-to-speech and screen magnification come preinstalled so that there is no need to purchase any additional assistive technology. Web sites, on the other hand, tend to be developed by millions of different companies and organizations, often without accessibility experts involved and, surprisingly, without even basic knowledge of accessibility.



JOHN DUGDALE, *Vespers*, Cyanotype, 8 x 10 inches, 1999.



JOHN DUGDALE, *Spirit*, Cyanotype, 8 x 10 inches, 1998.

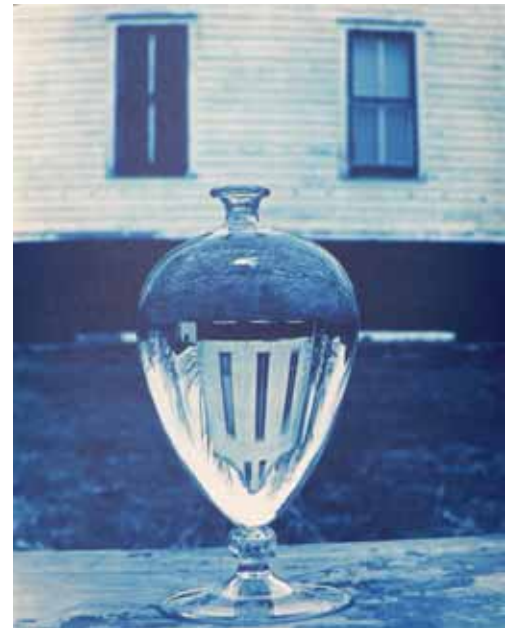
Promising developments

In short, although the United States has a robust slate of laws related to online accessibility, the laws have not had the effect of making the Internet widely accessible to persons with disabilities in the United States. A large part of the explanation is that the existence of laws and regulations is not sufficient. There must also be established mechanisms to develop guidelines, monitor compliance, promote innovation, and provide meaningful enforcement powers to ensure compliance. In the United States, no such agency exists. In fact, issues related to online accessibility are spread across agencies, and often no group has monitoring or enforcement roles with the laws and regulations, which include the undue-burden loopholes to avoid compliance.

However, there has been a recent surge in federal government focus on accessibility:

In March 2010, the Access Board released a draft for public comment of the first major revision of Section 508 and the accessibility provisions of the Telecommunications Act. The intent is that new guidelines, which are slated to be adopted in late 2010 or early 2011, will cover telephones, cell phones, mobile devices, PDAs, computer software and hardware, Web sites, electronic documents, and media players. If the new guidelines are implemented as suggested, the principles of accessibility will be strengthened considerably, although they continue to focus primarily on sensory and motor impairments. As mentioned earlier, this focus on sensory and motor impairments is primarily due to the concrete nature of the accommodations needed, along with the 30-year track record of existing research on how to successfully design computer interfaces for people with sensory and motor impairment, as compared to a shorter history with fewer concrete guidelines on how to design for people with cognitive impairments.

In June 2010, the Departments of Education and Justice took the unusual step of issuing a joint statement to educational institutions to say that the use of inaccessible e-book readers and similar devices by elementary, secondary, and postsecondary institutions was a violation of both the ADA and Section 508. Because many e-book texts and readers are not inherently accessible to readers with visual impairments, the movement by some universities to require the use of e-books was neglecting the needs of students and faculty with visual impairments. This means that educational institutions must consider the accessibility of not just the Internet and computers, but of newer mobile, Internet-enabled technological devices as well. There is no prohibition against using accessible e-book readers or other mobile devices, just the obligation for educational institutions to en-



JOHN DUGDALE, *Farmhouse Inverted in Venini Vase*, Cyanotype, 20 x 16 inches, c. 1993.

Computer interfaces are still primarily visual, and when the nonvisual equivalents are not coded properly, blind or low-vision individuals may have access to none of the content.

sure that any of these that they adopt are not going to exclude students and faculty with disabilities.

In July 2010, a memo from the Office of Management and Budget and the federal chief information officer announced that although the Justice Department has not collected data on compliance since 2003, it would, in conjunction with the Government Services Administration, begin to collect data on compliance again as soon as fall 2010.

In July 2010, the Department of Justice also began pursuing a series of revisions to the ADA to account for changes in technology and society since the passage of the law. These updates include accessibility of movie theaters, furniture design, self-service machines used for retail transactions, access to 911, and Web site accessibility. The latter is the most significant proposal, because it would clearly extend the coverage of the ADA to the Web sites of all entities covered by the ADA: local and state governments and places of public accommodation. In such a case, the requirements of the ADA would apply widely to entertainment and commerce online, resolving the disagreements in the courts about the applicability of the ADA to e-commerce. All of these strengthened regulations, however, will be of value only if they are actually complied with, monitored, and enforced.

Finally, in October 2010, President Obama signed the Twenty-First Century Communications and Video Accessibility Act of 2010 into law, which includes provisions to expand the use of closed captioning and video description for online content; facilitate accessible advanced communications equipment and services such as text messaging and e-mail; promote access to Internet services that are built into mobile telephone devices such as smartphones; and require devices of any size to be capable of displaying closed captioning, delivering available video description, and making emergency information accessible. As with previous technology guidelines, however, these new standards include the ability to opt out if an undue burden exists.

Promoting greater accessibility

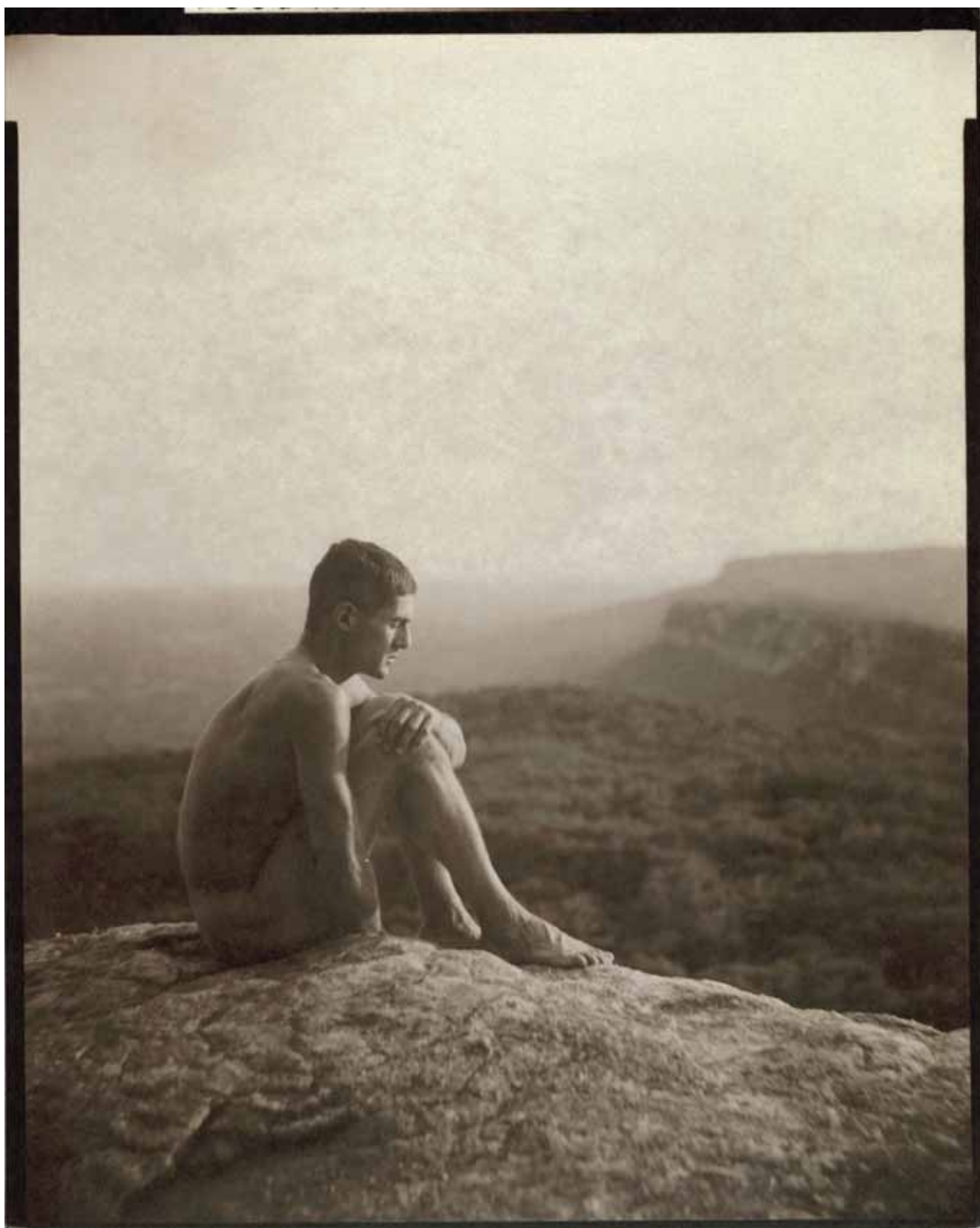
Despite the laws and enforcement activities by federal and

state governments, the goals and intended outcomes of accessibility deserve greater consideration than they receive. Clearly, the most important goal is increased access to the information, communication, and services that are increasingly central to education, employment, civic participation, and government. Additionally, accessibility laws and regulations have the potential to provide incentives for the creation of new technologies, to make existing technologies usable by a wide range of users beyond people with disabilities, to involve people with disabilities in the development of regulations and technologies, to foster the creation of better-quality tools for developers, to make evaluation easier, and to educate the general populace about the importance of equal access for people with disabilities. For instance, eBay has recently been working on making both its buying and selling experience accessible, opening up the door for users with disabilities as consumers, sellers, and entrepreneurs.

During 2010, the U.S. government moved to strengthen regulations and policies related to Web accessibility; however, this is not enough. Evaluating compliance, improving enforcement, and increasing the availability of information about compliance are all necessary to promote and improve Web accessibility. There are a number of potential actions that can be taken to promote accessibility within industry and government.

The key concept to keep in mind is that the technical solutions for Web accessibility already exist. Coding standards for accessibility already exist, as do evaluation methods and testing tools. Because the technical knowledge already exists, the key challenges are knowledge dissemination, compliance, and enforcement. The first four actions below can be readily implemented, whereas the last two would require a sizeable reconceptualization of the approaches to accessibility monitoring and enforcement:

Creation of a chief accessibility officer within the federal government, dealing specifically with information and communications technology accessibility. Microsoft has such an officer, which has led to improvement in the accessibility of its interfaces. Although the White House currently has a



JOHN DUGDALE, *Never Forget Who You Are*, Albumen print, 8 x 10 inches, 2002.

special advisor on disability policy, this person deals with every issue related to disability policy, not specifically with computer interfaces.

Compilation of best practices related to processes for monitoring and enforcement of Section 508 within agencies. Although the www.section508.gov Web site currently has a link for good practices, it does not provide information except for technical specs, and many of the links are broken. Agencies need to have guidance on how to monitor and enforce compliance within their organizations. For instance, the monitoring processes used by recovery.gov, soon to be published in the textbook *Interaction Design*, are the types of best practices that need to be documented from other agencies.

Increased openness and transparency requirements explaining how agencies can ensure that their Web sites are compliant with Section 508. For instance, although many federal Web sites have an accessibility statement simply noting that their site is Section 508-compliant, there is limited information about what features make the site compliant, how the site was evaluated for compliance, and how the site maintains compliance. There currently are no requirements for federal Web sites to provide any information on site accessibility. Providing this roadmap to users with disabilities would be helpful.

Frequent, publicly posted evaluations of site accessibility across the government would be helpful in bringing the problem to light. For instance, the progress dashboard on the open government page at the White House (<http://www.whitehouse.gov/open/around>) describes how agencies are making progress toward the goals required by the Open Government Initiative. But it would be helpful to have similar data posted about agency progress toward accessible Web sites.

Altering laws to reduce the ability of covered entities to avoid compliance through undue-burden clauses. As noted above, these clauses have been widely used by corporations and government agencies to opt out of compliance with accessibility guidelines. Undue burden was originally conceived as a tool to be used in limited circumstances in which significant expense or effort would lead to the additional inclusion of only a small number of users or in which the expense or effort were simply beyond the resources of the organization. In practice, however, it is regularly used by companies and government agencies as a way to avoid many accessibility considerations, regardless of level of effort or

expense. So long as these clauses exist, many accessibility guidelines will lack any meaningful force.

Finally, creation of a government enforcement agency devoted to accessibility monitoring and enforcement, which could be headed by the new chief information officer. Rather than continuing a decentralized approach, such an agency could create regulations, monitor and enforce compliance, support research, and better include persons with disabilities in the development of accessibility regulations. A dedicated agency could also educate the public and government employees on the importance of accessibility as an issue of inclusion and civil rights.

Without changes such as these, people with disabilities will not be able to fully participate in online opportunities in education, employment, communication, and government. Simply put, people with disabilities need accessibility to be included as equal members of the information society. Public policy has promoted the rights of persons with disabilities in the United States for four decades, and as technology evolves, so must legal guarantees of rights for persons with disabilities.

Recommended Readings

- P. T. Jaeger, "Assessing Section 508 Compliance on Federal E-government Web Sites: A Multi-Method, User-Centered Evaluation of Accessibility for Persons with Disabilities," *Government Information Quarterly* 23, no. 2 (2006): 169–190.
- J. Lazar et al., "Investigating the Accessibility of State Government Web Sites in Maryland," in *Designing Inclusive Interactions—Proceedings of the 2010 CWUAAT*, P. Langdon, P. Clarkson, and P. Robinson, eds. (London: Springer-Verlag, 2010): 69–78.
- J. Lazar et al., "Up in the Air: Are Airlines Following the New DOT Rules on Equal Pricing for People with Disabilities When Websites are Inaccessible?" *Government Information Quarterly* 27, no. 4 (2010): 329–336.

Jonathan Lazar (jlazar@towson.edu) is a professor of computer and information sciences and director of the Universal Usability Laboratory at Towson University, Towson, Maryland. Paul Jaeger (pjaeger@umd.edu) is an assistant professor in the College of Information Studies and director of the Center for Information Policy and Electronic Government at the University of Maryland, College Park.

Copyright of Issues in Science & Technology is the property of University of Texas at Dallas and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.