1997:337). Indeed, one can trace a counterpoint between weaving and the invention of computing itself. [2] For the British engineer Charles Babbage (1791-1871), who is now widely credited with devising the first computer, made his essential breakthrough by connecting his Difference Engine, a calculating machine, to weaving technology in order to create the Analytical Engine now held to be in effect a computer. The Frenchman J.M. Jacquard (1752-1834) had created a system whereby a series of pasteboard cards with punched holes instructed a mechanical loom as to which threads to use and in what pattern. Babbage saw that he could extend this idea to calculation: "the analogy of the Analytical Engine with this well-known

process is nearly perfect" (Babbage [1864] 1994:89). Thus his Analytical Engine consisted of two parts like an automated mill: a store, where the variables were kept, and a mill, where the required operations could be performed. In short, the practice of modern, automated weaving made the idea of computer programing possible. One might then see the famous saboteurs, who threw their shoes *(sabots)* into the mechanized looms as the creators of the first computer viruses. Seen in this light, computers are both digital and analog machines, new and old, virtual and manual. The interaction between these poles is played out across the body of the user, whether weaver or programer.

Net life

Virtuality asks some intriguing questions about the definition of the body and, by extension, of the self. Virtual domains seem to be one example of the perception that the body need not stop at the skin but can be an open and complex structure. Virtual environments can thus be liberating for those with motor disabilities in allowing all users equal freedom of movement. For deaf people, cyberspace is at present one domain where no one can tell if you can hear. The proliferation of close-captioning devices, email, fax and TTD machines has allowed many deaf people a far greater degree of interaction with the hearing world than was previously possible. Video-conferencing permits long-distance sign-language conversations to take place for the first time. Perhaps even more remarkably, many autistic people have come to rely on the Internet as a means of communication, away from the distractions presented by N.T.s (Neurologically Typical). As one user describes it, this representational medium is far more interactive for the autistic person than real life encounters: "Reading faces is like looking into a rippling pond. I am too distracted by the edges, glints of light, to make much of it." For the writer Temple Grandin, who has autism, the Internet is a metaphor for her mind: "I talk Internet talk because there is nothing out there closer to how I think" (Blume 1997). As such experiences multiply, many are wondering what personal identity will come to mean in a virtual society.

Let us take some examples from the proliferating virtual world. Allucquère Rosanne Stone has described the intriguing story of "Julie Graham" (Stone 1995:65-81). In 1982, a psychologist called Sanford Lewin joined a CompuServe online discussion group under this name, having discovered by chance that women approached him very differently if his online persona was female. "Julie" was also a psychologist, disabled as the result of a car crash: "She was now mute and paraplegic. In addition, her face had been severely

disfigured, to the extent that plastic surgery was unable to restore her appearance" (Stone 1995:71). She had become a recluse but CompuServe changed her life and enabled her to socialize again in an online environment. This identity was thus very well tailored to meet the expectations of online users as to the radical potential of the new medium. Here was a woman, unable to function in everyday life, restored to sociability, not to mention sexuality. "Julie" became a popular source for advice and ideas on the network but she was not willing to stop there. A successful lecturing career and marriage in real life were invented by Lewin and broadcast over the Net until the deception became too great and he attempted to kill her off, like a soap-opera character. However, Julie's fans were distraught, beseiging the chat-lines with messages, offers of help and advice, forcing a miraculous recovery. Suspicions were aroused: "It was the other disabled women online who pegged her first. They knew the real difficulties-personal and interpersonal-of being disabled" (Stone 1995:74). Ironically, it was exactly the way in which "Julie" ignored the practicalities of being a disabled woman that made her seem so perfect to the able-bodied. When the deception was revealed, many women in particular felt extremely upset, often rationalized as a sense of betrayal and loss. Given that the chat-line lends itself so readily to this kind of posturing, the truly surprising element of the story might be that people were so surprised by the deception. The important element here is the date, 1982, a time when the medium was sufficiently new that utopian hopes could still be entertained for it. As a disabled woman

turned successful lecturer, "Julie" met those expectations perfectly, in retrospect, too well. The unveiling of "Julie Graham" was one of the ways in which the Web lost its innocence.

The Julie Graham incident took place on a very different Internet from that which is now being discovered by millions of users worldwide. The almost exclusive focus on text that was the inevitable corollary of limited computer memory has given way to an intensely visualized space. Where it seemed at first that the Net had simply adapted the traditional spaces of representation for its own use, it is now creating new modes of visual experience. At many sites, the visitor may only gain access to certain spaces if his or her cursor happens to pass over a particular spot. Links may appear and disappear before you have time to access them. Space is not transparent, as it is in the perspective model, but dense and mobile, offering possibilities that may or may not be seen. One consequence of these new spaces is to put more power in the hands of the site organizers. At the intriguing site "Bodies©INCorporated," designed by Victoria Vesna, freedom and power are mediated across the body (see Figure 3.5). The user can design and name a new avatar body, using twelve possible textures of material ranging from

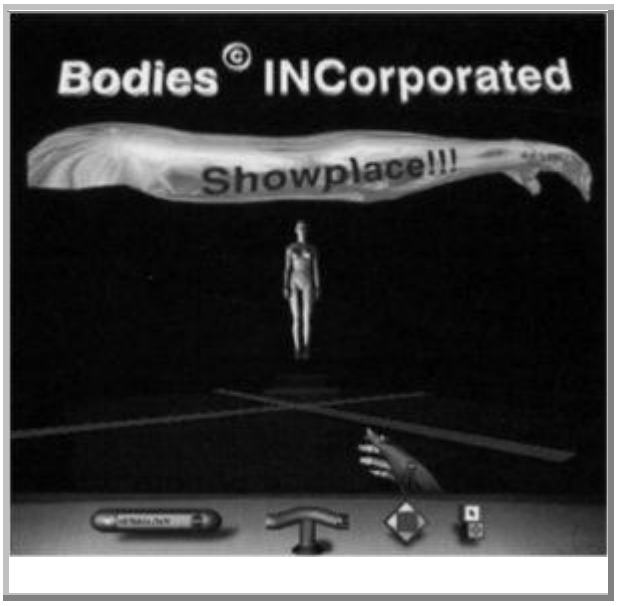

Figure 3.5 View of Bodies©INCorporated website

black rubber to lava and water. It is then equipped with a particular sound, such as that of chaos. These additional pyschological features were added so that the site was not perceived as being simply about sexuality. Only then are age, gender and sexuality rendered at the owner's choice. Thus your left leg could be masculine and the right feminine. The avatar can be heterosexual, homosexual, bisexual, transgendered or other (specify). Age can be from 0 to 999. The avatar can play a number of roles in relation to the actual user, such as alter ego. At each stage, the user can view the avatar and modify any aspect that is unsatisfactory. But the user's freedom is explicitly limited by the ArchiText of the designers, who place themselves in the role of "God/ dess." The avatar may be "deceased" at any time or consigned to "Limbo," a space on the site where only names and statistics appear. Alternatively, users can and do opt to be placed in Limbo or the Necropolis, indicating that submission to power has its own pleasures. The most dramatic space is

known as "Showplace!!!," where the user's "body" is displayed for all to see. As the site description explains: "Immediately available is a mirror image of yourself. The camera zooms in, you feel an enormously warm and glowing light directly above you. Your image is projected onto a large billboard that millions of people are watching. Appearing larger than life gets you sexually aroused. You are being watched by countless eyes and through multiple lenses-all in sharp focus." This highly visualized, sensual experience of being both consumer and commodity at once can be seen as an expression of Netlife itself at the current moment, far from its original text-based formats.