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This paper examines the range of ways that science fiction literature, film, and television programming have portrayed aspects of concept of the information society. It introduces both science fiction and the information society using contemporary scholarship. It goes on to examine aspects of the information society along political, economic, and cultural axes and then explores treatments in relevant works. The paper concludes that the science fiction genre has much to offer scholars and students of information society studies, and it proposes the incorporation of science fiction into information science curriculum and canon as a narrative parallel to standard non-narrative scholarship.

Headings:

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THE INFORMATION SOCIETY IN SCIENCE FICTION

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Introduction and Scope

*“I think Frankenstein ought to be required reading for all scientists.”
Dr. Charles Forbin in Colossus: The Forbin project¹*

The phrase “information society” (or “information age”, or “information revolution”; I will discuss this below) is becoming more and more commonplace. Yet, for all their rigorous research and discourse, information scientists and theorists may not be able to answer a key question in this field: What would everyday life be like in an information society? In this paper, I posit that the best way to address this question is by broadening the academic conversation to include works of science fiction (SF), the creators of which have been considering this and related questions for centuries. This is not a matter of simply deferring to SF’s predictions about the future, which would be a mistake: when SF does attempt to prophesy, it loses its real literary power to the lure of shallow techno-fetishism. Writer Michael Chabon (2008) has commented that

[a]ccurate prediction of the future, of its technologies and traumas, has always seemed to me to be the least interesting thing about science fiction. So Arthur C. Clarke predicted the global satellite network – so what? He also predicted the widespread use of hovercrafts and the dominance by 2001 of the commercial Earth-Moon space trade by Pan-Am Airlines (d.1991). Such prescience or the obligation to display it is, more than bad writing, the element of a work of sf that most readily dooms it – regardless of whether the predictions turn out to be right or wrong. Every future we imagine is transformed inexorably into a part of our children’s understanding of their past, of the assumptions their parents and grandparents could not help but make. (p. 103)

The same problems exist for the imagined futures of information society studies as do for SF, but even worse than inaccurate predictions is that,

[d]espite the vast volumes of paper that have been devoted to celebrating or (less often) cautioning about this emergent socioeconomic structure, there is something of a dearth of statistical analysis of the issues raised... There seems to be more interest in visionary exhortations about the [Information Age] than in close inspection of what trends and potentials are revealed by available data. (Ian Miles cited in Duff, 2000, p. 124)

So, SF and information society studies seem to have complementary strengths. SF is most effective when it focuses on humanity in a technological context and isn't disproportionately concerned with the details of the futuristic worlds that provide that context. Information science is most effective when it relies (as academic writing should) on statistics and critical analysis rather than jumping to fantastic conclusions. Information scientists and theorists should leave the "visionary exhortation" to the creators of SF, which would free information society studies of the tendency to create its own science fiction and encourage more devotion to rigorous academic research. In this paper, I will demonstrate that SF has a long and healthy history of addressing such issues as fall within the information society studies umbrella, with the hopes of initiating a move toward including SF works in the classrooms, readers, and bibliographies of information science.

It would be impossible to cover the entire world of science fiction for a paper such as this. I beg the reader to keep this in mind while reading what inevitably is an incomplete examination of the genre. Additionally, the careful reader will note that works originally published in English dominate the bibliography. This is a result of the limited set of works available to the author, an English-speaking American student. Non-English SF traditions are strong and should be considered in any further research. What SF is considered in this paper may originate from any country or era, and the body of texts includes novels, short stories, feature-length motion pictures, and television programs.

Although I did not address other media or formats, they should certainly be considered in future research; notable examples include the music of David Bowie (e.g. “Oh! You Pretty Things” [1971]) and Gary Numan (e.g. “Are Friends Electric?” [1979]), graphic novels like Paul Pope’s (2002-2004/2005) *100%* and Masamune Shirow’s (1989/2004) *Ghost in the Shell*, video/computer games such as *Flashback* and *Bioshock*, and Karel Capek’s play *R.U.R.* (1921/2004), which contains the first use of the word robot (“Robot”, n.d.), among many others.

Two authors that I am particularly indebted to for my perspectives on science fiction and the information society are Istvan Csicsery-Ronay, Jr., whose *The Seven Beauties of Science Fiction* (2008) was indispensable in understanding the cultural significance of SF, and Frank Webster, who, as editor of *The Information Society Reader* (2004), shaped my understanding of the information society conversation without my actually having read any of his oft-cited research. While I would happily recommend these works to any reader, further research into this topic would benefit from examining other writers’ points of view.

¹ Sargent & Bridges, 1970/2004.

Introduction to Science Fiction

As with any literary genre, it is difficult to pin down a definition of SF with satisfactory specificity. Istvan Csicsery-Ronay, Jr. does not claim to provide such a definition in *The Seven Beauties of Science Fiction* (2008), but he does discuss several literary components (the “beauties”) that no work of SF is without. Individual works vary in their application, and those described as “borrowing elements from SF” might apply only one or two with no less effectiveness. Csicsery-Ronay’s beauties are as follows.

1. Fictive neology: “... new words and other signs that indicate worlds changed from their own... They engage audiences to use them as clues and triggers to construct the logic of science-fictional worlds” (p. 5). Fictive neology may take the form of fully new words or whole languages (e.g. *The Day the Earth Stood Still*’s “Klaatu barada nikto” [1951/2003] or *Star Trek*’s Klingon language [Meyer & Flinn, 1991/2000]), adjustments to already extant words (e.g. *Nineteen Eighty-Four*’s [Orwell, 1949/1977] “thoughtcrime” and “ungood”), or new definitions for familiar words (e.g. the cyberpunk “meat” [Gibson, 1984, p. 152], signifying the physical body).
2. Fictive novums: “... a historically unprecedented ‘new thing’” that indicates “imaginary models of radical transformations of human history... Every SF text supplies fictive novums and responses to them, and thus engages the sense of real inhabitants of technorevolutionary societies that are bombarded with real-world

3. Future history: "... a sense of the integral connections between the past and the future" that "create[s] convincing images of life in the future" or an alternate past or present] (p. 6, 76). "Although SF need not always be set in the future, the genre is inherently future-oriented" (p. 6). For example, the subgenre known as steampunk is not necessarily set in *our* future, but rather a future (or even a past) in which steam powered technologies and aesthetics never lost their dominance in the world; the "information age" may even have arrived, but zeppelins still crowd the skies and gas lamps light up the night (pp. 108-110).
4. Imaginary science: "playful deviations from known scientific thought" (p. 6). "SF is the main artistic means for introducing technoscientific ideas and events among the value-bearing stories and metaphors of social life" (p. 6). Imaginary science includes such "not-impossible" or "difficult to disprove" ideas such as faster-than-light transportation, self-aware artificial intelligence, and fully-immersive virtual reality, as well as many scientific absurdities like audible explosions in the vacuum of space, shrink-rays, and alien life forms that apparently speak English upon first contact.
5. Science-fictional sublime: usually "... a sense of awe and dread in response to human technological projects that exceed the power of their human creators" (p.

- 7). “Of all contemporary genres, SF is the one most expected to evoke the experience of the sublime” (p. 6). The science-fictional sublime is often experienced when the technological comes to resemble the natural or the cosmic, whether large (*Star Wars*’s moon-sized space station, the Death Star [Lucas, 1977/2008]) or small (humanoid machines spontaneously developing the capacity for emotion, such as in *Blade Runner* [Scott, Fancher, & Peoples, 1982/2007]).
6. Science-fictional grotesque: “... a sense of fascination and horror at the prospect of intimate category-violating phenomena discovered by human science” (p. 7). “This is the domain of monstrous beings, interstitial beings, and anomalous physical phenomena” (p. 7). The science fictional grotesque reveals the fact that humans are not “at the top of the food chain”, either literally (as in the film *Alien* [Scott & O’Bannon, 1979/2004] and sequels) or figuratively (as in H.P. Lovecraft’s [1928/1999] “The Call of Cthulu” and related stories, wherein it is revealed that humanity will be destroyed not because it is the object of some evil activity, but because the “the earth and all its inhabitants are but a momentary incident in the unending cyclical chaos of the universe” [Joshi, 1999, p. xvii]).
7. The *Technologiade*: traditional narrative forms and devices reoriented toward “the transformation of human societies as a result of innovations attending technoscientific projects ... [SF’s] miniature myth-making structures simultaneously dislocate the audience’s orientation toward its familiar reality, and link the fictive predicament – radically new in its objective conditions – to conventional story-structures that recontain the radical newness” (p. 7). The term refers to the literary form known as the *Robinsonade* (after Daniel Defoe’s

[1719/2003] *Robinson Crusoe*), which may be defined as the “modern colonial adventure tale” (p. 217). The *Technologiade* incorporates elements of the *Robinsonade*, along with those of Gothic and utopian literature, as SF’s history runs parallel with these literary forms. Significantly, it also breaks away from and reorganizes their structures to create its own literary structures and formulas.

SF has a surprisingly long history of considering the technology and its applications. Mary Shelley’s (1818/2003) *Frankenstein: or, The Modern Prometheus* is widely considered to be the first true work of science fiction precisely because it considers the creation, implementation, and implication of a specific (and still nonexistent) technology: human reanimation. Other cited ancestral works include Louis-Sébastien Mercier’s (1771/1999) *Year 2440* for being the first fictional work set in the distant future (Alkon, 1987, p. 5); Jonathan Swift’s (1726/2003) *Gulliver’s Travels* for critiquing the effects of science on society (Csiscery-Ronay, 2008, p.126); Thomas Moore’s (1516) *Utopia* for presenting a fictional foreign land (ibid, p. 35); and, going back even further, *1,001 Arabian Nights* for including encounters with mechanical humanoids and beasts (Pinault, 1992), and so on. Although considering works of legend, myth, and tradition to be SF has its detractors (Aldiss, 1986, pp. 27-28), I believe the topic of this paper would be enhanced by a brief discussion of one SF-ancestral work: the story of the golem. The earliest golem story may be found in the Babylonian Talmud, in which an artificial man is created and destroyed, and this story apparently refers to discussion in an older text, the *Sefer Yezirah* or *Book of Creation*, which

contains lengthy discussions on God’s creation of the universe achieved by combinations of the twenty-two letters in the Hebrew alphabet. Thus the Talmud and the *Sefer Yezirah* represent two complementary discussions: the fact of creating artificial life and the technique for doing so. (Bilski & Idel, 1988, p. 10)

A twelfth- or thirteenth-century text explains several techniques for creating a golem, all of which involve animating lifeless dust with the careful use of words and letters. One technique involves writing “the three Hebrew letters that spell *emet* (truth) ... on his forehead. When the first letter is erased, leaving the word *met* (he is dead), the golem is destroyed” (ibid, p. 11). Perhaps the best-known golem is that of Rabbi Loew, who is said to have created it in the 16th century to protect the Jews of Prague during persecution by those who believed that Christian blood was required for Passover rituals (ibid, p. 14). Isaac Bashevis Singer (1988) describes the unfortunate outcome of this well-intended creation:

In the golem legends, the golem often became independent, rebellious, and a danger to his maker. The golem of Prague ... turned out to be an extreme literalist. When he was ordered to bring water from the well into Rabbi Loew’s house, he kept on carrying pails of water in until the house was flooded. *It grew more and more difficult to “program” him.* He became so unruly that Rabbi Loew had to erase the sacred name engraved on his forehead and thus put an end to his existence. (p. 8, emphasis mine)

Although the golem story may be used as an allegory for many human pursuits gone awry, I believe that, because of its emphasis on the difficult relationship between the word of the fallible creator and the word’s interpretation by the too-faithful creation, it has special significance when considering the way that information technology, likewise the product of fallible creators, effects expressions of society.

Definition of the Information Society

The information society is defined or described in many ways by information theorists. The least satisfying definition is the somewhat fatalist idea that the information society is simply what follows the industrial society, which in turn follows the agrarian society, as time marches on. This remarkably causality-free notion of inevitable progress is somewhat appealing and very reassuring because of its confidence, but “Every generation believes that it is at a seminal point on the time-line of technological progress. It is either the age of iron, the age of the train, the age of flight, or in our case the information age” (Haywood, 1997, quoted in Duff, 2000, p. 13). Christopher May (2002) points out that

the relationship between technology, its ‘character’ and society is much more complex than a unidirectional determinism allows. Furthermore, many of the claims for revolution telescope the history of information technologies to identify profound changes on the basis of the most recent generations of ICTs [information and communication technologies]. Once we recognize that there has been a long gestation of the relevant technologies and of their interaction with societies across the globe, then the claims for revolution start to look a little strained. (p. 14)

Additionally, there is the question of “whether we are indeed witnessing a new social formation, or a variant of an older, much more familiar, social formation” (Duff, 2000, p. 98); it is largely assumed to be the former without much serious consideration of the latter, with few exceptions. At best, the historical definition fails to hold much water, and, at worst, it could be used by as justification for the exploitation of “developing” nations much like they have been exploited in the name of industrial progress. It is

because of the relatively un-illuminating nature of this definition that I have chosen to use the term “information society” rather than “information age” or “information revolution” in this paper, although these terms may be more useful in other contexts and discussions.

Moving outside the frame of unidirectional determinism, the passage of time does raise an important question, namely: Are we there yet? As Alistair Duff (2000, pp. 4-6) and May (2002, pp. 3-5) have pointed out, the phrase “information society” dates from the 1960s, and discussions of the ideas associated with it, but absent the phrase itself, may date back even further. Duff (2000) also cites a range of sources from a range of dates that claim “we” (presumably the United States, Japan, or possibly all “developed” nations) have been living in an information society since the 1980s, some that say it’s just around the corner (again, for some or for all), and some that speak of it as a still-distant possibility rather than an impending inevitability (pp. 2-13). That there is disagreement here may mean that we simply are not there yet, but it could also mean that simply do not have effective agreement on what it is we are trying to discuss – it is, after all, difficult to predict a change without knowing what that change will be. Thankfully some scholars, including May, refrain from prediction at all, and choose to acknowledge trends without claiming to know their outcome and meaning. At first glance, definitional ambiguity seems to confound an examination of illustrations and discussions of these ideas in works of science fiction narrative. On the contrary, I believe it lends weight to my premise that science fiction narrative has the ability to make its audience consider the possible full implications of speculations about the information society in a way that would enrich scholarly information science literature.

In *Information society studies*, Duff (2000) examines the major “information society theses” found in information science literature and elsewhere. The first, which Duff calls the “information sector thesis”, examines the notion that an information society is one in which the economy has moved from an emphasis on industry and manufacturing to service and information as a commodity (19).

The Production and Distribution of Knowledge in the United States [by Fritz Machlup, 1962] is believed to contain the original proof of the startling proposition that an advanced industrial society, namely the USA, was on the way to developing a new type of economy, the ‘information economy’. This proposition involved two interrelated empirical claims: first, that a significant and inexorably growing section of the gross national product of the USA can be attributed to information activities; and second, that the numerically dominant sector of the US workforce is now engaged in information-centred occupations. (p. 21)

Duff believes that Machlup’s work was seriously flawed and, worse, that these flaws have been recognized by almost no one. The result is that the corpus of the information sector thesis, which “is almost entirely derived from [this] single source” (p. 19), is also seriously flawed. Nevertheless, this version of the information society thesis “has been so dominant that it is hardly surprising that commentators have been misled into assuming that it is the *only* version in existence” (p. 19). If, as Duff suggests, we should view this thesis with a great deal of skepticism at best, we must still acknowledge its influence. Additionally, one wonders if the information sector thesis is something of a self-fulfilling prophecy, as media commentators and government officials alike seem to revel in the idea of an information economy, celebrating the arrival and growth of information technology businesses to their constituent areas. Whether this move toward an information *economy* affects change toward a whole information *society*, however, remains to be seen.

Duff also discusses an “information flows thesis”, which hails largely from Japan and attempts “to measure the amount of information cascading across the communication channels of society” (p. 71). Significantly, this research, which began in the late 1960s, examines “*all* information flows – without privileging science or any other particular kind of information or knowledge” (p. 72), and, I would add, without concern for economic value. This thesis suggests “that ‘any society is largely involved in information activities’, and that, therefore, ‘information societies have existed since man established the first community’” (Duff, p. 95, quoting Tetsuro Tomita). What is significant about today (and what is analogous in importance with the information society as conceptualized by Western theory) is that Japan (and probably other nations) is becoming *Bunshu Shakai*: “the segmented information society” (p. 85), an emergent social formation in which

[t]he demand for information provided by mass media, which are one-way communications, has become stagnant, and the demand for information provided by personal telecommunication media, which are characterized by two-way communication, has drastically increased. This means that our [Japan’s] society is moving toward a new stage ... in which more priority is placed on segmented, more detailed information to meet individual needs instead of conventional mass-reproduced conformed information. (The Ministry of Posts and Telecommunication in Duff, p. 85)

In this thesis, then, changing methods and reasons for *communicating* information are the reason for massive societal change. Duff is critical of this thesis’s relative lack of academic rigor (specifically that these studies have not been done in a peer-reviewed setting), but praises its methodology and insight nonetheless. It is also worth noting that the West has largely ignored the scholarship and theory resulting from *Bunshu Shakai* studies. Incorporating this work, in Duff’s opinion and my own, would enrich and deepen Western information society theory.

Duff summarizes the third thesis, the “information technology thesis”, as “[contending] that the information society is a society which has gone through a so-called ‘information revolution’ or ‘information technology revolution’” (p. 101); technology itself (along with our creation and use of it), rather than economics or communication, is the central force behind the transition. Duff cites Ian Miles as the most important proponent of this thesis, and Miles, in turn, refers to three sub-schools of thought that all take different positions on the relationship between technological development and social change.

The first is *continuism*, which emphasises the overlaps between different phases of industrialisation – including the phase signified by terms like ‘informatisation’ and ‘information society’... [Continuists are] social determinists, maintaining that technology does not have any in-built propensities for the shaping of society, and certainly not for shaping it in a socially progressive fashion. At the opposite pole is *transformism*, according to which IT [information technology] is radically changing the nature of society and its institutions; it is doing this with a high degree of inevitability, and is doing it largely in a way which satisfies many of the standard criteria for social progress... Advanced nations are purportedly in the early stages of a technological revolution which is bringing about a social formation – even an epoch, a civilisation – as different from industrial forms of life as the latter differed from agrarianism. (pp. 111-112, emphasis mine)

Miles’s third sub-school is his own synthesis, which he calls *structuralism*, a reference to the literary and cultural analytical method of the same name. For structuralists, “the information revolution is conceptualised as taking place within the framework of the industrial revolution, as a kind of mini-revolution, and the information society as being a species or phase of advanced industrialism” (p. 113). Additionally,

... structuralism maintains, with transformism, that ‘IT represents a revolutionary technology’, and that talk of a new ‘IT paradigm’ is valid (Miles *et al.* 1988: 7, 247-8). It also agrees that society is going to be significantly changed by the information revolution, and that the term ‘information society’ will be an accurate descriptor for the resulting formation. It readily acknowledges that, on even the most conservative scenario, we face ‘a vision of the future which implies immense social change’. (p. 113)

Duff, acknowledging that Miles's research has similar problems as the *Bunshu Shakai* theorists, suggests that the structuralist approach "is best seen as a serious negotiation with the proposition that *a new socio-technical system has resulted from a set of social, economic and technological factors, including, centrally, the growth of informatics*" (p. 129, emphasis in original). Because "advocates ... regard technology (whether telecommunications, computers, or new media, notably the internet, or indeed all new technologies) as both the major expression of and the primary force bringing into being the new Information Society" (Webster, 2004, p. 10), the structuralist approach holds a great deal of promise in quantitatively studying the effects of technology on society.

Each of these definitions of the information society embodies a conception of how our world will change as time passes. They are all flawed to varying degrees, but they nevertheless accurately capture some of the ways people think of themselves as part of a society. This consideration will guide the rest of the paper, where I will examine individuals in society along the axes of government, economics, and culture.

What are people like as citizens of an information society's government?

Without ever explicitly claiming a particular political ideology, information theorists have strong opinions about the role of government in an information society. In *The Information Society: A Sceptical View*, Christopher May (2002) summarizes the conversation effectively, describing a general belief that

not only are new social groups appearing but they will mobilize widely dispersed individuals into effective (niche) interest groups who will have an increasing impact on the political process. In this sense, the 'new social movements' are emblematic of political community in the information age. Mobilizing on the basis of arguments for the transformation of political personal lives, as well as political interest, a new networked politics is emerging...

An underlying distrust of government in the discussion of information society often takes the form of an explicit argument that it will allow civil society to successfully confront the state, which is outdated and no longer (if it ever was) the most efficient way to organize society... [T]he power of the state to intervene has ... been fatally compromised by ICTs. (pp. 15-16)

Yoneji Masuda's (1990/2004) vision exemplifies this trend and is particularly well-elaborated:

Industrial society is a society of centralized power and hierarchical classes. The information society, however, will be a multi-centered and complementary voluntary society. It will be horizontally functional, maintaining social order by *autonomous and complementary functions of a voluntary civil society*...

The political system of industrial society is a parliamentary system and majority rule. In the information society the political system will become a *participatory democracy*. It will be the politics of participation by citizens; the politics of autonomous management by citizens, based on agreement, participation and synergy that take in the opinions of minorities. (p. 17, emphases in original)

Masuda does not foresee the outright death of government, but the line of reasoning is similar: mass-computerization means stronger citizen groups, and stronger citizen groups, in many evaluations, means weaker government.

A similar point of view can be found in Howard Rheingold's (2002) *Smart Mobs*. Rheingold espouses the "power of the mobile many", citing situations in Manila, Seattle, Vancouver, San Francisco, Britain, Senegal, Mexico, and Chechnya in which organizers used mobile and network technology to organize political demonstrations, nonviolent and nonviolent alike (pp. 157-164). He also describes the notable trend of "p2p" (peer-to-peer) journalism, in which mobile users forward personally acquired information to each other without any mediating journalistic institutions (pp. 164-169). Of course, these means may be used to "unserious" (entertainment) ends just as easily as or easier than "serious" (political) ones, and it is as yet unclear how effectively these trends might be co-opted by government or corporate interests. Recent developments in Iran – citizen-journalist information and government-generated disinformation informing the outside world through Twitter ("Iran uses tech tools", 2009) – and China – the government blocked mobile phone and Twitter service during clashes between ethnic Uighurs and ethnic Han Chinese in the Xinjiang region (Kuhn & Block, 2009) – certainly add complexity to the discussion. In any case, Rheingold's point is that there can be no denying the significance of technologically-enabled social trends that circumvent official or familiar channels for whatever reason; they may provide early examples of Masuda's "stronger citizen groups" and "weaker government", or they may provide counterexamples (by way of tech-savvy governments) that are no less significant.

Esther Dyson, George Gilder, George Keyworth, and Alvin Toffler (1996/2004) also predict a dramatic decline in the influence of the government: “Second Wave [industrial society] policies centralize power in bureaucratic institutions; Third Wave [information society] policies work to spread power – to empower those closest to the decision” (p. 41), though they also state that “smaller government does not imply weak government; nor does arguing for smaller government require being ‘against’ government for narrowly ideological reasons” (p. 38). Their evaluation also emphasizes an increase in power for the private sector: “[government] should focus on removing barriers to competition and massively deregulating the fast-growing telecommunications and computing industries” (p. 37). May’s (2002) own opinion is appropriately skeptical:

I argue ... that although the decline of the state is a death frequently foretold, the end is hardly imminent. Not only have some states been very successful at organizing their economies to respond to the information revolution, the supposition that such a revolution can transpire without a central role for the state is mistaken... [O]nly by obscuring the role of law and authority in society can proclamations of the information age suppose the state must necessarily be in decline. (pp. 16-17)

Because its scope tends to be society-wide (or wider), most science fiction addresses government, if sometimes only peripherally. The utopian/dystopian subgenre, exemplified by George Orwell’s (Orwell, 1949/1977) novel *Nineteen Eighty-Four*, addresses governmental issues of particular interest to information society studies, and these works in particular depict powerful, centralized governments that derive power over their citizenry through the control and manipulation of information. *Nineteen Eighty-Four* depicts a system of government called “Ingsoc”, short for “English Socialism”, though it is in fact a totalitarian system that “rejects and vilifies every principle for which the Socialist movement originally stood, and ... does so in the name of Socialism” (p. 216). This contradiction between stated names and meanings extends into IngSoc’s four

governmental ministries, including Minitruth (which constructs and disperses misinformation and disinformation) and Miniluv (which is a center of brainwashing and surveillance, as well as the home to the Thought Police) (pp. 3-4). Through a tight control on its citizens' information intake (distributing shallow entertainment to the proletariat masses, constantly editing the historical record for the appearance of consistency, and so on) Ingsoc is able to remain in power indefinitely. *Nineteen Eighty-Four* contains perhaps the classic illustration of a totalitarianism that derives its power from information more than any other resource, and, as such, deserves special consideration within information society studies.

Aldous Huxley's (1932/1969) *Brave New World* depicts a government that is similar to that in *Nineteen Eighty-Four*, with differences that are notable for this discussion. *Brave New World* also describes totalitarianism ("The World State"), but one whose power derives from an intellectually pacified citizenry rather than one that is paralyzed with paranoia. What Ingsoc does to the proletariat class alone, The World State does to everyone by means of shallow entertainment (television, sexually-themed "feelies" similar to the "talkies" of Huxley's day, games like "Centrifugal Bumblepuppy", holidays, constant sexual stimulation in pairs or groups, and the all-purpose drug soma). Neil Postman (1985/2005) describes the difference between *Nineteen Eighty-Four* and *Brave New World* this way:

What Orwell feared were those who would ban books. What Huxley feared was that there would be no reason to ban a book, for there would be no one who wanted to read one... Orwell feared that the truth would be concealed from us. Huxley feared the truth would be drowned in a sea of irrelevance. Orwell feared we would become a captive culture. Huxley feared we would become a trivial culture, preoccupied with some equivalent of the feelies, the orgy porgy, and the centrifugal bumblepuppy (sic). As Huxley remarked in *Brave New World Revisited*, the civil libertarians and rationalists who are ever on the alert to oppose

tyranny "failed to take into account man's almost infinite appetite for distractions." (pp. xix-xx)

Brave New World, then, demonstrates the idea of an information *overload* society and a possible counterargument to the idea that a given technology inevitably engenders democracy and citizen participation.

Brazil (Gilliam, Stoppard, & McKeown, 1985/2004) also presents a variation on the *Nineteen Eighty-Four* vision of government. Here, the information-conscious spirit of the government is very similar, with the Ministry of Information's Deputy Minister proclaiming that "in a free society, information's the name of the game. You can't win the game if you're a man short." Slogans abound: "Information: the way to prosperity"; "Be safe: be suspicious"; "Don't suspect a friend, report him". What *Brazil* adds is a tone of absurdity that allows the audience to laugh a bit at the means before recoiling in horror at the end. Ridiculous amounts of paperwork with impenetrable numerical codes may pave the road, but the destination is still monstrous torture at the hands of bureaucrats in the "information retrieval" department. *Brazil* demonstrates that government institutions need not operate with any kind of efficiency or competence to impose information-based totalitarianism.

SF visions also exist that present some decentralist governments, though perhaps not those desired by Masuda and Dyson et al; one such optimistic point of view is found in the *Star Trek* franchise. In *Star Trek* history, the nations of earth are at war with one another until Zefram Cochrane completes the first faster-than-light ("warp") spaceflight in 2063. Nearby aliens, the Vulcans, detect the flight and make first contact with humans (Okuda & Okuda, 1999, pp. 80-81). A combination of further technological advance and the incorporation of Vulcan and other alien life forms into earth society lead to change so

massive that Captain Jonathan Archer declares, less than 100 years later, that “[o]n Earth, between humans, war has been eliminated” (Coto & Straiton, 2004/2006). The resulting worldwide government is part of the United Federation of Planets, an “interstellar alliance of planetary governments and colonies, united for mutual trade, exploratory, scientific, cultural, diplomatic, and defensive endeavors” (Okuda & Okuda, 1999, p. 538) modeled loosely after our own United Nations. 24th-century Captain Jean-Luc Picard informs a person from the 21st century that “[t]he acquisition of wealth is no longer the driving force in our lives. We wish to better ourselves and the rest of humanity” (Braga, Moore, & Frakes, 1996/2005), indicating that it is market-dominated economics, and not government, that has withered away. *Star Trek* suggests a utopian scenario in which the world is united by a desire for discovery and exploration, and that these information-gathering activities are essential to Earth’s united government.

The inverse of *Star Trek*’s “withering of the market” scenario can be found in works like William Gibson’s (1984) *Neuromancer* and Neal Stephenson’s (1992) *Snow Crash*. These works, both of which fall into the cyberpunk subgenre and emphasize the economic and political significance of information, depict heightening corporate power and declining government power along with irrelevant or fractal political boundaries. In *Neuromancer*, national militaries are still operational, but the private standing armies of megacorporations are able to compete quite easily. The only nonmilitary government activity described in the book is that of the Turing Registry, which monitors artificial intelligences for unusual activity; governments apparently have no interest or ability in confronting the murder, drug-dealing, hacking, and organized crime that thrives on the street. In *Snow Crash*, the United States is actually only sovereign over what we would

today consider government property. North America has been broken into thousands of “burbclaves”, privately-owned, miniature nation-states distributed across the land. Corporate brand and sovereign nationality have become largely indistinguishable because of the increased power of the former and the decreased power of the latter. Government work is depicted as excessively bureaucratic and largely unconcerned with daily criminal behavior. Gibson has stated that “the cyberpunk future ... is a future in which globalization really does work both ways, and everybody—unless they’re very, very, very rich—winds up getting to be part of the Third World” (Long, 2007). In other words, the state has declined and business has been free to prosper, but the world is quite clearly not a better place for it.

Global technocracy, government by “technician” or scientist, is another common governmental form in SF. In the Arkady and Boris Strugastky’s (1962/1978) *Noon: 22nd Century*, a form of Communism has found worldwide acceptance, with the curious development that there are no longer any manual laborers: all physical work, save some on newly colonized planets, is performed by machine, leaving only intellectual work for humans. The world is governed by the World Council, a representative body “sixty per cent composed of teachers and doctors” (p. 51), and apparently few lifelong politicians; also curious, Communism seems to have successfully decentralized (but not “withered”) in forming the World Council. The Council is not without internal controversy, but the World Council’s authority and wisdom is generally accepted by its constituents, who live in general contentment, thanks in large, it seems, to constant on-the-job intellectual stimulation. Although one might jump to the conclusion that the World Council is actually a totalitarian institution, this would be a fallacy; at worst it expresses a naive

understanding of the lure of power among those with knowledge and wisdom beyond that which exists in reality. In fact, all of the governments described here are all somewhat oversimplified precisely because they are fictional. SF representations of government succeed and are useful to information society studies because they are an extension of the central “What if?” question that guides SF’s contemplative nature.

Other political considerations exist in information society studies, including the question of increasing surveillance as enabled by advances in information technology. David Lyon (2001/2004) has written extensively about what he calls “the sociology of surveillance” with an eye toward its modern and postmodern forms, especially those that rely on advanced information and communication technology (p. 328). He lists four strands of surveillance theory, beginning with a nation-state orientation, which “focuses on political imperatives that require surveillance, within geopolitical and military struggles” (p. 329). Lyon cites Christopher Dandeker’s observation of parallel, increased bureaucratization in the military (the external expression of nation-statehood) and internal policing and pacification (the internal expression of nation-statehood) (p. 329-330).

Lyon himself cites George Orwell’s (1949/1977) *Nineteen Eighty-Four* as having “provided the most lasting and vivid metaphors for state surveillance” (Lyon, 2001/2004, p. 330). All citizens are monitored centrally by two-way television screens installed throughout their homes and elsewhere, and it is assumed or feared that nothing escapes their view. Besides this technologically-enabled method of surveillance, the state cultivates a whole culture of suspicion centered upon a godlike figure known as Big Brother (who, the posters proclaim, “is watching you” [p. 2]). Ingsoc Party members experience a kind of simultaneous fear and love of Big Brother because they are taught to

believe in Ingsoc policies whole heartedly, and because his power extends to an accused person's torture and probable obliteration from the public record. The cult of Big Brother is so strong that the main character, Winston Smith, is afraid of doing or saying anything that could even be perceived as subversive (p. 3). *Nineteen Eighty-Four* illustrates the dangers of an asymmetrical information society, where those in power remain in power because they control the flow of information.

In the film *Minority Report* (Spielberg, Frank, & Cohen, 2006/2002), "Precrime" is the name given to the division of the Washington, D.C. police department where special surveillance technology enables the precognition and prevention of murder. What makes Precrime possible is a trio of young people who, because their mothers abused a fictional drug, neuroin; the resulting neurological condition burdens these youths, called "Precogs" with the ability to see certain details about murders that have yet to take place, including both premeditated and unpremeditated murders. The Precogs are heavily sedated and connected to a computer system that records their visions and speech; the resulting data becomes evidence in a quick and largely rote teleconference trial, which establishes Detective John Anderton's (Tom Cruise) legal right to arrest (and convict!) the perpetrator before the murder has even been committed. Additionally, police are apparently able to tap into commercial surveillance (discussed below) to track suspects, like ordinary closed-circuit security cameras but with more flexibility. Although the conflict of the film as expressed in its dialogue is more to do with free will and destiny, this moral question is framed in the context of a society with near-ubiquitous surveillance. Remarkably, no one in the film questions the right of Precrime to peek in on their lives, perhaps because they are more concerned with pleading innocence of a crime

they have not (yet?) committed. *Minority Report* presents a scenario of invasive surveillance used by the state to dubious ends, even if torture and execution never enter the scene.

Lyon's second strand of surveillance theory is a variation on the first, but with even more emphasis on bureaucratic intrusion into everyday life. The reigning body derives power over its subjects by instilling an ever-present sensation of uncertainty and resulting terror, illustrated best, as Lyon points out, by Franz Kafka's (1925/1999) *The Trial*. Like the novel's main character, Josef K., subjects of this system must constantly ask themselves, "Who wants this information, what do they already know, is it correct, and what will be done with what I divulge?" (p. 330). Lyon also cites Max Weber, for whom "bureaucratic surveillance is a means of procuring efficiency, especially in the large scale and unwieldy tasks that confront any expanding modern state" (p. 330).

Brazil (Gilliam, Stoppard, & McKeown, 1985/2004) offers perhaps the best SF exploration of bureaucratic surveillance. Again, slogans like "Be safe: be suspicious" and "Don't suspect a friend, report him" signal an Orwellian scenario, but, whereas citizens in *Nineteen Eighty-Four* are watched over by the precise and all-knowing Big Brother, *Brazil*'s Ministry of Information *makes mistakes*. The film depicts a simple clerical error resulting in the arrest, torture, and death of Archibald Buttle (Robert De Niro), an ordinary man, when it is Archibald Tuttle, an alleged terrorist, whose arrest was actually ordered. To further illustrate the absurd tragedy of the situation, we learn that Tuttle's criminal activity is his work as a freelance air conditioning repairman who bypasses bureaucratic officialdom as a form of public service. Through a series of misinterpreted events, the Ministry of Information arrests and tortures main character Sam Lowry

(Jonathan Pryce), a recent transfer to the Ministry's Information Retrieval department, because he is believed to be in on Tuttle's terrorist plot. During the torture, he lapses into a daydream that includes Tuttle literally disappearing in a flurry of government paperwork. *Brazil* effectively relays the notion that a nation's citizens may have as much reason to fear the information-seeking habits of an ineffective government as those of one that makes that trains run on time.

A variation on this sort of bureaucratic surveillance can be seen in *Gattaca* (Niccol, 1997/2008). In this case, the organization in power is not, as in *Brazil* and *The Trial*, a bumbling-but-massive governmental agency that barely knows what information it has and what to do with it; instead, a cold, efficient aerospace corporation (like, the audience is told, all other businesses) monitors its employees with daily biometric exams and screens its applicants based on genetic makeup. "Of course," the main character Vincent Freeman (Ethan Hawke) tells us, "it's illegal to discriminate. *Genoism*, it's called. But no one takes the law seriously." The result is a *de facto* system of participatory surveillance that flourishes because everyone knows it happens and everyone holds information that is key to the system's survival. Citizens do not fear being punished for the wrong crime as they do in *Brazil* because there is no wrong answer. In *Gattaca*, a person simply is or is not valid, and, without going to the extreme measures that Vincent undertakes, there is nothing he or she can do about it.

The third strand of surveillance is one of a "technological logic (or 'technologic' for short)" (p. 329). Lyon draws primarily on the work of Jacques Ellul, whose idea of *la technique* "integrates the machine into society ... constructs the social world that the machine needs ... seeks relentlessly for the one best way to operate, and in doing so

steadily seems to erode human agency” (p. 331). It is through this process that the computer becomes central to modern surveillance and that, possibly, surveillance becomes indivisible from computing: “once in place a surveillance technique such as a digitized identification number will tend to expand to cover other purposes” (p. 331).

In the film *Colossus: The Forbin Project* (Sargent & Bridges, 1970/2004), a supercomputer (Colossus) intended by the US government to control all military activity unexpectedly achieves self-awareness. Among its first actions as an autonomous, sentient entity is the commandeering of the world’s computer networks and surveillance at all available military installations. Where surveillance does not exist, Colossus demands its installation by threat of global nuclear holocaust. In this way, a computer literally embodies Ellul’s notion of a social world constructed to the specification of a machine.

A subtler example can be found in the manhunt scenes of *Minority Report* (Spielberg, Frank, & Cohen, 2006/2002). Precrime officers make use of machines called “spyders”, which are small, agile surveillance devices that allow quick, accurate searches of large or heavily populated areas.

Spielberg transforms this sequence into a witty homage to Alfred Hitchcock’s 1955 movie *Rear Window*... [T]he camera floats upward until it occupies a birds-eye, cross-sectional view of the entire apartment complex. The building’s inhabitants stop their actions just long enough to allow the spyders to scan their eyes. The audience sees a man sitting on his toilet, a couple making love, and ... a woman who beats her husband (or boyfriend) during a domestic squabble pause just long enough for a retinal scan before she resumes hitting her partner. (Vest, 2007, pp. 138-139).

These people have been conditioned, somehow (perhaps through the threat of physical injury – spyders can deliver small electrical shocks, and Precrime officers seem willing to dole out extensive amounts of pain through an array of nonlethal weapons – or criminal prosecution), to allow the machines to interrupt and do their work during even the most

intimate and passionate of human activities. The spyders are not literally in control the way Colossus is, but the people act as if they are.

In M.T. Anderson's (2002) *Feed*, where the Internet is actually installed in one's brain (discussed more below), the main character, Titus, explains the dilemma of an opt-in system that is ultimately controlled by dubious institutions:

Of course, everyone is like, *da da da, evil corporations, oh they're so bad*, we all say that, and we all know they control everything. I mean, it's not great, because who knows what evil shit they're up to. Everyone feels bad about that. But they're the only way to get all this stuff, and it's no good being pissy about it, because they're still going to control everything whether you like it or not. Plus, they keep like everyone in the world employed, so it's not like we could do without them. And it's really great to know everything about everything whenever we want, to have it just like, in our brain, just sitting there. (p. 40)

An individual's feed is typically installed at birth, meaning that that individual has no control over the decision, which is made by the parents, illustrating the way that a technology can seem to take on a power of its own as the surrounding culture comes to embrace it. Resistance is rare and makes life difficult, exemplified by one character's being denied a job on account of his lack of feed implant (pp. 226-227). *Feed* demonstrates the difficulty of choosing to resist participatory surveillance when that surveillance is an integral part of the dominant culture.

Lyon's final strand of surveillance theory is that of "political economy", wherein one class exerts its dominance over others through surveillance practices (p. 331). "Electronic technologies are harnessed to assign varying economic values to different groups, and thus to computerize the production of inequality" (p. 332). This idea refers to such practices as centralizing workers in a factory so that they may all be overseen by management simultaneously, whether physically (as in the case of workshop employees) or electronically (by means of computer networks or closed-circuit television security

cameras). Lyon cites Gandy's assertion that "consumer surveillance [operates] on panoptic principles, whereby personal data is used to sort populations into consuming types. Electronic technologies are harnessed to assign varying economic values to different groups, and thus to computerize the production of inequality" (p. 332).

Just such inequality is depicted in *Minority Report* (Spielberg, Frank, & Cohen, 2006/2002), where surveillance constantly reestablishes the consumer/supplier relationship. As each individual is detected by ubiquitous retinal or iris-recognition scanners, automated marketing displays and recordings adopt content tailored to personal taste and shopping history. Because this class-reinforcing activity is masked by a layer of customer service, those who are surveilled pass by without apparent concern for the security of their personal information. In fact, the only person visibly unnerved by the situation is our thoroughly Anglo hero when, after illegal eye transplant surgery, the commercial surveillance networks address him by an obviously Japanese name. Unless the system identifies them incorrectly, people in this society are neutral-at-worst about their being subjugated by a dominant class.

A similar scenario is at work in *Feed* (Anderson, 2002), in which most Americans have equipped their brains with implanted Internet access (the "feed"). Titus, describes the situation:

But the [best] thing about the feed, the thing that made it really big, is that it knows everything you want and hope for, sometimes before you even know what those things are. It can tell you how to get them, and help you make buying decisions that are hard. Everything we think and feel is taken in by the corporations ... and they make a special profile, one that's keyed just to you, and then they give it to their branch companies, or other companies buy them, and they can get to know what it is we need, so all you have to do is want something and there's a chance that it will be yours." (p. 40)

Titus is remarkably honest about the degree to which his hopes and dreams are tied up with his identity as a consumer. This worldview isn't an uncommon one in our world, but the feed vastly increases the degrees of both subjugation and acceptance.

The preceding ideas, again, are the four strands of *modern* surveillance theory. Lyon's carefully points out that *postmodern* surveillance theory does not yet exist, and warns that it will require more than just adding the phrase "in cyberspace" to the end of all the above descriptions (p. 340). Key points include the creation of multiple online identities by individuals, whether deliberate, conscious, or neither; the use of these identities by governments, bureaucracies, and businesses to predict (and perhaps determine) the actions and interests of those individuals; the blurring of supervision and surveillance as a part of electronic management techniques; and, finally, the application of panoptic principles upon every minute aspect of everyday life (the "superpanopticon") (pp. 332-341).

Even if postmodern surveillance theory is a work in progress, *A Scanner Darkly* (Linklater, 2006) shows that SF is capable of addressing the issues involved. In the film, Bob Arctor (Keanu Reeves) is an undercover narcotics officer assigned to investigate and dissolve a network of drug dealers. In order to retain absolute anonymity, Arctor and his co-workers all use a "scramble suit", a wearable device that displays a rapidly changing patchwork of images of hundreds or thousands of people and alters his voice, ensuring that viewers simply cannot guess his actual identity. In order to maintain his professional anonymity in the company of his dealer contacts (since he cannot use the scramble suit in this environment), he adopts the name Fred and establishes a second identity as a junkie, partaking in Substance D as much as the others. In the process of his investigation, which

involves extensive surveillance of the house that the group of dealers and junkie congregate, he (Fred) becomes part of his (Bob's) own investigation. His sense of reality begins to break down, both as a result of using Substance D (a kind of paranoia-inducing hallucinogen) and as a result of being on both sides of the surveillance camera. When he is sent to a rehab clinic, we learn that he has been an unwitting player in a police operation to infiltrate the clinic itself. Within the rehab system, he is given yet another name, Bruce, and a job tending crops that we learn, although Bob/Fred/Bruce does not understand, that his new job is part of the Substance D manufacturing process. *A Scanner Darkly* effectively considers the personal and societal effects of an environment of heightened surveillance and bureaucratically exploited multiple personal identities.

Another political concern when for information society studies is that of the “digital divide”. Pippa Norris (2000/2004) has broken this idea into three parts: global divide among countries and social stratification within countries (both of which I address below), and democratic divide. The idea of a democratic divide “concerns the potential impact of the digital world on the distribution of power and influence in political systems” (p. 279). Norris observes that “cyber-optimists” emphasize the “possibilities of the Internet for the involvement of ordinary citizens in direct democracy” (p. 279). “Cyber-pessimists”, she says, “regard digital technology as a Pandora’s box unleashing new inequalities of power and wealth, reinforcing deeper divisions between the information rich and poor, the tuned-in and tuned-out, and activists and the disengaged” (p. 279). “Lastly, *cyber-skeptics* argue that both these visions are exaggerated, since so far the potential of the Internet has failed to have a dramatic impact on the practical reality of ‘politics as usual’, for good or ill” (p. 280). Norris’s observation predates the

2008 U.S. presidential campaign, which may have demonstrated a significant change in the use of digital tools by candidates and voters alike; it also predates the aforementioned political unrest in Iran and China as well as any critical evaluation of these situations.

The *Star Trek* franchise seems to fall into the cyber-optimist camp. Since civil unrest on Earth apparently ended with the ascension of Warp technology and contact with alien species, and since profit is no longer the motive for work (Moore & Landau, 1990/2007), we must assume that economic classes have been eliminated, leaving everyone on the same level for technological and democratic participation. *Feed* (Anderson, 2002), on the other hand, falls into the cyber-pessimist camp: feed links are the method for all communications, whether social, commercial, or political. Voting is the sole exception, since “only about seventy-three percent of Americans have feeds” (p. 92), but it is doubtful that people without one get the same attention from marketers and news organizations. Scott Westerfeld’s (2005) cyber-skeptical *Uglies* addresses the issue by giving all the city’s residents a network connection, although almost no one has any interest in political processes to begin with. In fact, because of intellect-dulling surgery performed to all 16-year-olds, the only ones to resist the city’s power structure are 15-year-old runaways who are, thus, disconnected from the ubiquitous networks. *Uglies* portrays a world where universal access, usually a lauded development, is not desirable because it increases the power of an untrustworthy government over its unknowing citizens.

Government is but one influential force over the lives of individuals, but it is one of major importance. Governments can control every detail of one’s daily life, or they can be made to institute empowering, liberating policies that reinforce the humanity of their

constituents, always affecting the very fabric of society. Information technology is not an apolitical or neutral development, and it demands enough respect to address the political implications of its application in a theoretical information society just as it should be addressed in our own, very real society. Information society studies would gain a great deal by examining the myriad ways that SF has treated political concerns.

What are people like as laborers in an information society's economy?

The economic structure of a society has many far-reaching expressions and implications, but for individuals, it typically comes down to performing tasks and securing personal health and well-being: work. Robert Reich (1992/2004) has described “three broad categories of work” that grew to dominate the American labor market in the late 20th century and will continue to dominate in the future, and which, according to Reich, are also growing in other (presumably, but perhaps not exclusively) “developed” nations. These categories are “*routine production services, in-person services, and symbolic-analytic services*” (p. 205, emphasis in original). In this model, routine production services include those jobs that have been traditionally thought of as “blue-collar”, as well as their “low- and mid-level managers” (p. 205). Significantly, this also includes the “hordes of data processors [the human variety] stationed in ‘back offices’ at computer terminals linked to worldwide information banks... The ‘information revolution’ may have rendered some of us more productive, but it has also produced huge piles of raw data which must be processed in much the same monotonous way that assembly-line workers and, before them, textile workers processed piles of raw materials” (p. 206).

Nineteen Eighty-Four's Winston Smith, *Brazil*'s Sam Lowry, and *THX-1138*'s (Lucas & Murch, 1971/2004), THX (Robert Duvall) all fall into the category of routine production services. Smith works as a clerk in the Ministry of Truth, where he doctors

photographs and newspaper articles, erasing from the public record those people who the government wishes forgotten. Lowry is a clerk in the Ministry of Information's Department of Records. THX works on with a team constructing the robotic security guards that maintain order in his city. All three attempt to break free of their mundane, work-centered lives (Lowry by securing a promotion, Smith by attempting to start a revolution, THX by escaping his underground city) upon the introduction of a romantic interest that stirs up repressed emotions; neither Smith nor Lowry is ultimately able to escape, and THX's future in the barren desert aboveground is uncertain at best. These are three effective, if cynical, illustrations of the lives of routine-production services workers.

Much less cynical is *Gattaca* (Niccol, 1997/2008), which presents the possibility of routine production services as an opportunity for something even greater. Vincent Freeman is born with a congenital heart condition because his mother "put her faith in God's hands rather than those of her local geneticist". As a result, he is denied any work except that of a janitor (in-person services, discussed below). He is so set on achieving his lifelong goal of spaceflight that he adopts the identity, including the use of genetic material, of someone (Jude Law) who previously worked in routine-production services, processing data for the Gattaca Aerospace Corporation. Vincent (now "Jerome") is depicted, genetic "viability" and criminal behavior aside, as the perfect employee, making "not one error in a hundred thousand keystrokes"; he also takes time to watch every launch that the company sends up, setting him apart from almost all other employees. In this way he demonstrates a deep commitment to the mundane, repetitive tasks that will lead to the fulfillment of his dream. *Gattaca* demonstrates the possibility

that routine production services may also give someone the means to an end greater than can be understood by those for whom this work is a foregone conclusion.

Reich's second work category, in-person services, "must be provided person-to-person and thus are not sold worldwide... In-person servers are in direct contact with the ultimate beneficiaries of their work; their immediate objects are specific customers rather than streams of metal, fabric, or data In-person servers work alone or in small teams. Included in this category are retail sales workers, waiters and waitresses, hotel workers, janitors, cashiers, hospital attendants and orderlies, nursing-home aides, child-care workers, house cleaners, home health-care aides, taxi drivers, secretaries, hairdressers, auto mechanics, sellers of residential real estate, flight attendants, physical therapists, and – among the fastest-growing of all – security guards" (p. 206). These are, essentially, service economy jobs, and SF depicts them somewhat less often, or at least with less significance, than the other two work categories.

In SF, in-person services seem to be among the likeliest victims of mass automation. Often it is merely an environmental detail, the meaning of which characters are not obligated to confront. We audience members, however, are free to consider the societal implications of *THX-1138*'s (Lucas & Murch, 1971/2004) robot security guards, *Total Recall*'s (Verhoeven, 1990/1997) automated taxicabs, and *The Jetsons*'s (Hanna & Barbera, 1962/2004) mechanical maid, Rosey. It can also be a matter of comic relief, as in the case of *Star Trek: Voyager*'s (Coto & Straiton, 2004/2006) Emergency Medical Hologram (Robert Picardo), whose stiff bedside manner results in many a smirk on the part of the crew and audience alike. Tension over the subject may also be present, as in the film *I, Robot*, (Vintar, Goldsman, & Proyas, 2004), where Detective Del Spooner

(Will Smith) suspects, and is not proven wrong, that depending on robots for this and other kinds of work is not wise. *Noon: 22nd Century* (Strugatsky & Strugatsky, 1962/1978) discusses the subject, presented as dialogue between a refugee from an earlier time and a native of the 22nd century:

[Slavin said,] “You, Yurii, like to talk about optimum use all the time. Meanwhile, unimaginably complicated litter robots, gardener robots, moth-and-caterpillar-eating robots, and ham-and-cheese-sandwich-making robots are running all over the place. That’s crazy. It’s even worse than killing flies with a sledge hammer, as we said in my day...”

“Quite the opposite. It’s the liberation of thought, it’s comfort, it’s economy. After all, who wants to pick up trash?” (p. 101)

So, automation of in-person services allows people to work in symbolic-analytic services, implying that the latter is preferable. That the word *robot* is derived from the Czech word for forced labor (“Robot”, n.d.) could give us reason to embrace automation: if it can be automated, a human is too good for it. Workers in Kurt Vonnegut’s (1952/1999) *Player Piano* would disagree. “Vonnegut's oligarchs are not capitalists but engineers. In the future as he envisages it, the machines have completed their triumph, dispossessing not only the manual laborers but the white collar workers as well” (Hicks, 1963). The resulting rebellion falls apart from within: “followers are busily making gadgets out of the scraps of the machines they have been destroying” (ibid). The novel seems to conclude that a balance must be sought between reliance on self and a reliance on machinery, and that this balance may never be absolutely reached. SF provides a wealth of text on the subject of what might be called “automation ethics”, a vital consideration within information society studies. I discuss automation below when considering the culture of the information society.

When not automated, in-person services workers can be an effective way to build audience sympathy for a character. These characters seem to feel the same bewilderment

and exhaustion that we might with the futuristic world around them; nevertheless, they succeed at whatever task falls into their laps, just as we like to imagine we would. In *The Fifth Element*'s (Besson & Kamen, 1997), protagonist Korben Dallas (Bruce Willis) is just trying to make it through today without wrecking his taxi again, but that doesn't stop him from *saving the universe from certain destruction* when the need arises. Similarly, Ripley (Sigourney Weaver) of the *Alien* series is an ordinary officer on an ordinary mining ship who continually faces the extraordinary nemesis of a vicious and horrifying alien life form, not to mention the mental and emotional challenges (staying alive in a claustrophobically labyrinthine spaceship [Scott & O'Bannon, 1979/2004], keeping a child alive amid a hive of aliens [Cameron, 1986/2004], and gaining the respect and trust of an all-male penal colony [Fincher, 1992/2007]) that come with the job.

Alternately, in-person services workers may be used to embody an optimistic spirit about a future in which increasing human knowledge is the driving force for all activity. The television show *Star Trek* is exemplary, featuring a crew whose "five-year mission [is] to explore strange new worlds, to seek out new life and new civilizations, to boldly go where no man has gone before" (Black & Daniels, 1966/2009). Although their work includes elements of research and symbolic problem-solving, both of which fall into the third category (below), the crew of the starship Enterprise primarily performs in-person services. Exploration, making personal contact with other civilization, and "boldly going" are all tasks that require bodies to travel as much as data. Although they have received training to prepare them for such tasks, these (humans) are largely ordinary people who are doing a job that keeps them interested and makes a difference in lives across the galaxies.

Workers in Reich's third work category, symbolic-analytic services, "analysts solve, identify, and broker problems by manipulating symbols. They simplify reality into abstract images that can be rearranged, juggled, experimented with, communicated to other specialists, and then, eventually, transformed back into reality. The manipulations are done with analytic tools, sharpened by experience. The tools may be mathematical algorithms, legal arguments, financial gimmicks, scientific principles, psychological insights about how to persuade or to amuse, systems of induction or deduction, or any other set of techniques for doing conceptual puzzles" (p. 207).

Symbolic-analytic services workers are a common feature in SF because their expertise and skill make for a compelling character trait, especially as computers have infiltrated SF storylines. The manipulation of symbols is literally embodied by characters in *The Matrix* (Wachowski & Wachowski, 1999/2007) and its sequels. Here, Thomas Anderson (Keanu Reeves) spends his days doing some kind of corporate computer-oriented work (routine production services) and his nights doing some sort of hacking (amateur symbolic-analytic services), where he has named himself Neo. When Morpheus (Lawrence Fishburne) opens his eyes to the fact that "reality" is actually an elaborate system of virtual reality (the "Matrix") used by "the machines" to enslave unwitting humans, he is addressed only as Neo (the exception being a security program personified as Agent Smith [Hugo Weaving], who insists on calling him "Mister Anderson"). He is then taught how to bend the rules of the Matrix, allowing him to run faster, jump farther, and so on. Later, Neo becomes "The One", a prophesied human able to fully manipulate the Matrix just as easily as programs do. In this transition, he comes to literally embody symbolic-analytic services, expertly manipulating an entire world constructed of symbols

without using intermediary technology other than his Matrix connection. Although it borders on the fantastic, *The Matrix* illustrates symbolic-analytic services labor in its ideal form, where the worker is free to manipulate and interpret symbols without hindrance from any “lesser” type of labor.

Another, less fantastic worker in this category is William Geld (Tim Robbins) in the film *Code 46* (Boyce & Winterbottom, 2003/2004). William, an insurance fraud investigator in Seattle, is assigned to investigate passport (or “pabelle”) forgeries in a travel insurance processing facility in Shanghai. He performs his investigation through simple interviews, during which he uses his exceptional intuitive skills (combined with the help of an “empathy virus”) to discover who is lying, in this case, about *not* forging papelles. Maria Gonzales (Samantha Morton) is the forger, a routine-production services worker who smuggles out the faked papelles to earn extra money and, she believes, help people achieve desires when the authorities do not allow it. They begin an illegal romance, violating the code (number 46) that determines with whom a person may or may not enter a physical relationship. When they are found out, the authorities terminate her pregnancy and erase her memory. William convinces her of the relationship’s existence (though she does not remember it herself), and they flee to Jebel Ali, only to be caught again. This time, her new memories are left alone (“They don’t care what you think if you’re afuera”, she says), and she is banished to an unnamed desert, from which a return to productive city life is nearly impossible. William’s punishment, by contrast, is the deletion of his memories of the relationship and damaged intuition; he is allowed to return to his comfortable family life otherwise unharmed. *Code 46*, through its storyline

and atmospheric details, delivers a thoughtful picture of the Reich's categories of work, effectively examining economic stratification and its effects on a worker's humanity.

Categories of labor not included in Reich's assessment are agriculture, the extraction of raw materials, and construction. Perhaps he considers them to be jobs that do not represent the trends that are leading the way to the future (a view that some might find classist), or perhaps he believes that they will ultimately be automated and thus do not belong in his labor schema. Either way, it seems remiss to leave them out altogether. In SF, the automation of agriculture, extraction, and construction all seems to be a foregone conclusion, rarely discussed at any length. In some cases, such as the *Star Trek* franchise, technology exists "to dematerialize a quantity of matter, then to rematerialize it in another form, often ... to produce food" (Okuda & Okuda, 1999, p.406). Presumably, this technology makes agriculture largely obsolete in any practical sense, though it is unclear if this is the case for large-scale construction. Mineral extraction technology progresses to the point where it can even be done from a spaceship while in orbit ("Mining", n.d.).

Noon: 22nd Century (Strugatsky & Strugatsky, 1962/1978) is unusual among SF works in that it discusses the agricultural system in detail:

On [Earth] there were about two hundred thousand grain farms growing rye, wheat, corn, buckwheat, millet, oats, rice, kaoliang. There were specialized farms [...], and broad-based ones. Together they provided the foundation for abundance – giant, very highly automated complexes producing foodstuffs: everything from pigs and potatoes to oysters and mangoes. No accidental mishap, no catastrophe could now threaten the Planet with crop failure and famine. The system for ample production, established once and for all, was maintained completely automatically and had developed so swiftly that it had been necessary to take special precautions against overproduction. Just as there had never been a breathing problem, now mankind had no problem eating. (p. 140)

It is safe to assume that the same amount of energy has been put toward extraction and construction. The result is a society in which literally everyone is a scholar or scientist of some kind, even those who, because they are colonizing a new planet, must do manual labor until automated facilities are built (p. 94-95).

Another exception to the agricultural rule is the case of *Soylent Green* (Fleischer & Greenberg, 1973/2006). Unlike of the technological wonderland portrayed in *Noon: 22nd Century*, this film is set in a future United States where pollution has carried on unhindered, energy and other resources are scarce, and overpopulation is a fact of daily life. Because “real” food is hard to find – it is implied that agriculture as we know it is no longer possible – and incredibly expensive, all but the wealthiest citizens of New York City depend on the colorful nutritional rations of the Soylent Corporation, including Soylent Green. After learning that the “waste processing plant” where dead bodies are now shipped is actually the Soylent Green manufacturing plant, Detective Robert Thorn (Charlton Heston) returns to the city to famously announce that “Soylent Green is people!” *Soylent Green* confronts the possibility of a future where technological advances do not keep away the threat of environmental disaster and energy shortage. Here, the situation is so desperate that it leads some to conclude that cannibalism is the only means of survival.

Another aspect of the economics in information societies is the class structure. Norris (2000/2004) dubs this the “social stratification” problem, observing that, “As the Internet has become increasingly central to life, work and play – providing job opportunities, strengthening community networks, and facilitating educational advancement – it becomes even more important if certain groups are systematically

excluded, such as poorer neighborhoods, working class households, or peripheral rural communities” (pp. 277-278). As with the democratic divide, she explains the range of opinions: cyber-pessimists “emphasize deep-seated patterns of social stratification and the growth of an unskilled underclass in technological access”, cyber-skeptics “believe that technologies adapt to society, not vice versa”, and cyber-optimists “hope that in affluent postindustrial societies, at least, the digital divide will eventually succumb to the combined forces of technological innovations, markets and the state” (p. 278).

When it comes to telecommunication, *Code 46* (Boyce & Winterbottom, 2003/2004) falls mostly within the cyber-skeptic camp. Although William’s upper-class Seattle home is much more comfortable and luxurious than Maria’s humble apartment in Shanghai, both have easy access to high-speed mobile communication devices and are able to contact people across the globe with no problem. In other words, having access to this technology is clearly not the deciding factor in quality of life. We may safely assume, however, that Maria is denied any contact with the developed world once she is banished to the desert. On the subject of the semi-bioinformatic papelles, the film is decidedly cyber-pessimist. The papelle system has created its own class structure, which Maria is fighting by creating forgeries. Maria introduces William to one of her clients, Damien (David Fahm), who has dreamed of traveling to India to study bats, but has been denied a papelle. Although we learn that this denial was for good reason (he is tragically killed in India by a disease for which he lacks immunity), it is still clear that the world is divided into those who may cross borders and those who may not. The presence of the deserts, from which no one returns and in which no one has mobile telecommunications access, adds another level of social stratification that adds to *Code 46*’s pessimistic tone.

Norris (2000/2004) also examines the digital divide as it stratifies the entire world of economies as well: a “global divide”, as she calls it. Quoting the United Nations Development Programme, she points out the concern that

[t]he network society is creating parallel communications systems: one for those with income, education and – literally – connections, giving plentiful information at low cost and high speed; the other for those without connections, blocked by high barriers of time, cost and uncertainty and dependent upon outdated information. (p.274)

On the other hand, much has been made in recent years of farmers and small business owners across the “developing world” adopting mobile technology and adapting it to their needs much more fluidly and efficiently than their counterparts in wealthy nations (Garfield, 2008). Again, there is much debate

among cyber-optimists envisaging the positive role of the Internet for transforming poverty in developing societies, cyber-skeptics who believe that new technologies alone will make little difference one way or another, and cyber-pessimists who emphasize that digital technologies will further exacerbate the existing North-South divide” (p. 277).

Many SF works touch on the idea of a global divide, though often couched in terms of technology in general. *Star Trek* has a kind of Warp divide that may be analogous to our global digital divide: an order known as the Prime Directive “prohibits Starfleet personnel and spacecraft from interfering in the normal development of any society... In most cases, the Prime Directive [applies] to any civilization that [has] not yet developed the use of warp drive for interstellar travel” (Okuda & Okuda, p. 385). It is all but inevitable that, if the Prime Directive is mentioned, the situation is a controversial one. In the *Star Trek: Enterprise* episode “Dear Doctor” (Jacquemetton, Jacquemetton, & Contner, 2004/2006), crew members confront a situation that, it is implied, leads to the creation of the official policy. Captain Archer (Scott Bakula) and Dr. Phlox (John Billingsly) debate the possibility of curing a planet’s epidemic because it would interrupt

an evolutionary transition shifting dominancy from one sentient species to another, even though they have the capability (thanks to Warp technology) to do so. Captain Archer expresses the difficult conclusion:

Someday my people are going to come up with some sort of a doctrine, something that tells us what we can and can't do out here, should and shouldn't do. But until somebody tells me that they've drafted that . . . directive I'm going to have to remind myself every day that we didn't come out here to play God.

A contrasting policy is adopted by the Culture, *Consider Phelbas's* (Banks 1987/2008) galactic society of unfathomably intelligent machines and their humanoid companions:

With a sort of apologetic smugness, [the Culture] ... could prove statistically that ... careful and benign use of 'the technology of compassion' (to use a phrase in vogue at the time) did work, in the sense that the techniques it had developed to influence a civilization's progress did significantly improve the quality of life of its members, without harming that society as a whole by its very contact with a more advanced culture. (p. 498)

Dedication to statistical means-to-an-end rationality, however, also leads the Culture to wage military campaigns so dubious that several million people put themselves in stasis until "the Culture could statistically 'prove' the war had been morally justified", some 450 years later (pp. 508, 506). The book's main character opposes the Culture's self-applied right to "play God":

Horza could see no end to its [the Culture's] policy of continual and escalating interference. It could easily grow forever, because it was not governed by natural limitations. Like a rogue cell, a cancer with no 'off' switch in its genetic composition, the Culture would go on expanding for as long as it was allowed to. (p. 173)

The conflicting policies of these two spacefaring societies provide many an opportunity to consider the political, economic, and social implications of sharing or withholding technology of any kind.

Works that fall into or borrow from the cyberpunk subgenre often address the effects of computerization, not just technology in general, on society. Typically this occurs as an environmental detail with larger implications, like Maria's desert prison in *Code 46* (no information technology to be found, and no way back to the IT-rich cities [Boyce & Winterbottom, 2003/2004]) or the general squalor of the earthbound Sprawl contrasted with the hedonistic wealth of orbiting Villa Straylight in *Neuromancer* (Gibson, 1984). One work that addresses the global digital divide head-on is *Sleep Dealer* (Rivera & Riker, 2009), one of a very few works that examine the future of labor from the perspective of the "developing" world. Alex Rivera introduces his film by observing that, for ordinary residents of the "First World", telecommunications technology enables

this sense of being connected around the globe socially. Well, for corporations, they're able to use that connectivity to hunt for cheaper and cheaper workers in more distant corners of the planet. Thirty years ago we became accustomed to factories moving around the planet and using systems of transportation to send goods to American markets. About ten years ago we became accustomed to this outsourcing, offshoring thing... That process isn't over. So what's next? ... What kind of America would that be, if globalization were taken to its logical conclusion? ("Reviewing science", 2009)

In the film, he answers that question with virtual reality technology that allows people in one part of the world to operate machinery in another. The result is that the United States can take advantage of undocumented workers doing in-person services but without these workers ever actually crossing the border. *Sleep Dealer* is, unfortunately, in the minority among both SF and information science texts in considering change toward a globalized society alongside change toward an information society.

The nature of work is a significant aspect of a society, as is economic stratification, whether on a global or a national scale. Critical examination of these and other factors will ensure a deep and vital dialogue continues in information society

studies, and incorporating the hard, thoughtful questions asked in SF would provide it with even more depth and vitality.

What are people like as members of an information society's culture?

Although it is given far too little academic consideration, culture is an undeniably important aspect of human society, including the information society. Langdon Winner (1996/2004) has stated that “[t]o invent a new technology requires that (in some way or another) society also invents the kinds of people who will use it; older practices, relationships, and ways of defining peoples identities fall by the wayside; new practices ... take root” (p. 40). This statement identifies one of the most important considerations about transitioning into a new kind of society, albeit a too-rarely asked question: What is the culture of an information society? Politics and economics, as addressed above, would have deep influence over daily life, of course, but there are other dimensions of daily life that cannot be addressed in this framework. Information scientists and theorists have invested the greatest part of their energy on examining political, economic, scientific, and technological aspects of the information society, but they have considered these socio-cultural aspects as well, though usually with less depth. Most examinations are overly optimistic and unrealistic; the rest tend to fall into critical points-of-view, with what seems to be a bit more careful consideration.

Many theorists share a tendency to draw strong connections the ideals of the information society and those of the past in spite of the fact that it represents a “new age” in human progress. For example, Dyson, Gilder, Keyworth, and Toffler (1996/2004) claim that the information society will “renew the American Dream and enhance the

promise of American life” (p. 41), and that “putting advanced computing power in the hands of entire populations will alleviate pressure on highways, reduce air pollution, allow people to live further away from crowded or dangerous urban areas, and expand family time” (p. 37). While the phrase “American Dream” begs for critical analysis beyond the scope of this paper, it can safely be said that this version recalls a 1939 World’s Fair conception of the future, where traditional American values (by one definition) are paired with technological innovations that make those values easier to uphold. In the World’s Fair vision (specifically Norman Bel Geddes’s “Futurama” exhibit, funded by General Motors [Corn & Horrigan, pp. 45-50]), advances in various modes of transportation and their respective infrastructures turn cities exclusively into business centers, to which professionals commute every morning, and from which they return every night to their families in suburbs or nearby towns; for Dyson et al, telecommuting accomplishes essentially the same thing, except “virtually”. Masuda’s (1990/2004) model reveals a similar optimism, this time in the form of a kind of technological back-to-nature movement: “the spirit of industrial society has been the Renaissance spirit of human liberation, which ethically means respect for fundamental human rights and emphasis on the dignity of the individual, and a spirit of brotherly love to rectify inequalities. The spirit of the information society will be *the spirit of globalism, a symbiosis in which man and nature can live together in harmony, consisting ethically of strict self-discipline and social contribution*” (p. 20, emphasis in original). In both cases, “[t]he future ... becomes nostalgia: a longing for a past of small towns, a simple self-sustaining life, unencumbered by crass worldly goods” (Corn & Horrigan, 1984, p. 49).

On the other side (and, in fact, in direct response to Dyson et al) is Winner's (1996/2004) assertion that "American society will reproduce some of the basic tendencies of modernism" in its transition into a postmodern information society, including a focus on "individual gratification rather than collective problems and responsibilities" and "[t]he presentation of the future society as something nonnegotiable" (p. 51). Winner's critique points out a major gap in Dyson's vision: if the so-called American Dream could not be accomplished in modern, industrial America, why should we believe that it will happen in postmodern, "informational" America? The same critique applies to Masuda's model: will "globalism" simply pick up any slack in "human liberation" that the old "Renaissance spirit" has left behind, delivering human rights to those who are still denied them? To Winner, these are irresponsible proposals, in which oversimplified "solutions" ignore the real causes of the problems they ostensibly solve. Winner and those like-minded warn instead of a hyper-modern future, in which American problems remain essentially unchanged (or worsen) because of our relationship to new technologies.

The *Star Trek* franchise effectively represents Dyson and Masuda's point of view about a harmonious future brought about by technological advancement. On Earth, as discussed above, war is over and people no longer work for the sake of money, changes initiated by the incorporation of Warp-level technology into daily life. Ubiquitous computing allows anyone to work (or play) anywhere and, if necessary, travel in the blink of an eye. Since agriculture is unnecessary, those who farm or garden, like Captain Picard's brother (Jeremy Kemp), do so for personal satisfaction or some other, non-monetary reason (Moore & Landau, 1990/2007). Even global warming, described by Dr. Crusher (Gates McFadden) as "a danger faced by Earth in the 21st century" (Shearer &

Manners, 1988/2007), is no longer a risk. In *Star Trek*, Masuda's globalism and Dyson's version of the American Dream are both realized in what is depicted as a seamless transition.

The premiere episode of *The Jetsons* (Hanna & Barbera, 1962/2004) also effectively illustrates the view of Dyson et al, but through the lens of Winner's critique. Although George Jetson does commute to work as a "darn good digital index operator" (a job that apparently involves push the buttons that start and stop the procedure), the rest of the Dyson/Bel Geddes vision is complete – to no avail. Just about everything is automated, but no one seems aware that life is easier: Jane complains (in an unfortunate dig at "women's work") that she hates washing, ironing, and vacuuming while pushing a single button to complete each task. In cases where they do see what little work they do, we audience members understand that they aren't gaining anything valuable with their technological shortcut: Rosey the robot maid volunteers to analyze daughter Judy's homework tapes in geopolitics, Esperanto, and "space calculus" and give the homework answers so that Judy can go swimming in Acapulco that afternoon. Ultimately, what *The Jetsons* suggests is that people are people, no matter what fancy technology you throw at them. It is a shallow but valid complaint against the notion that we can depend on technological advances alone to make our lives better.

In his elaborate description of the information society, Masuda claims that, "[i]n industrial society, the materialistic values of satisfying physiological and physical needs are the universal standards of social values; but in the information society, seeking *the satisfaction of achieved goals* will become the universal standard of values" (p.20, emphasis in original). Dyson et al (1996/2004) agree: "[t]he central event of the 20th

century is the overthrow of matter. In technology, economics, and the politics of nations, wealth – in the form of physical resources – has been losing value and significance. The powers of mind are everywhere ascendant over the brute force of things” (p.30). They go on to imply that cyberspace will serve to repair the “personal confusion and social disorientation [that] is traceable to conflict *within us*”, conflict which exists “[b]ecause we constitute the final generation of an old civilization and, at the very same time, the first generation of a new one” (p. 37, emphasis in original). Presumably, we are the generation, broadly defined, that is coping with the awkward transition of sloughing off our worldly desires for a new, cyberspace-inspired intellectual or spiritual enlightenment. It is an appealing vision in many ways, but Winner (1996/2004) is skeptical, wondering “what kinds of bonds attachments and obligations are in the making” (p. 46) around the technologies of cyberspace. He believes, in other words, that materialism will be alive and well in the information society, with the difference that it will be centered on computers and related devices rather than whatever physical objects we have focused on in the past.

Star Trek again presents a vision that is parallel with Dyson’s and Masuda’s. Because of replicator technology discussed earlier, all of Earth is well-nourished and free to explore whatever intellectual pursuits they desire, as expressed in Captain Picard’s aforementioned statement that “[w]e wish to better ourselves and the rest of humanity” (Braga, Moore, & Frakes, 1996/2005). Similarly, *Consider Phlebas*’s (Banks, 1987/2008) reports “in excess of eighteen million people in the Culture, just about every one of them well nourished, extensively educated and mentally alert” (p. 91) and “free to take care of the things that really mattered in life, such as sports, games, romance, [and] studying

dead languages, barbarian societies, and impossible problems” (pp. 90-91) while the super-sentient machines provide for their every physical need. Of course, these two scenarios assume that these scarcity-eliminating technologies are available for all to use freely. In Cory Doctorow’s (2007) “Printcrime”, “printing” refers to the use of matter replicators similar to those in *Star Trek*. The difference is legality: private individuals are not allowed to own or operate printers, though it is unclear if, for example, governments or manufacturers may do so. After serving a ten-year jail sentence for printing “blenders and pharma ... laptops and designer hats”, the narrator’s father has a political awakening. “Lanie,” he tells his daughter, “I’m going to print more printers. Lots more printers. One for everyone. That’s worth going to jail for. That’s worth anything.” “Printcrime” reminds us that post-scarcity technology can only fulfill its revolutionary mind-freeing potential if everyone has access.

Having one’s every physical need provided for, however, is not a universally-accepted good in SF. E.M. Forster’s (1909) “The Machine Stops” describes a society in which each person lives in his or her own “cell”, never leaving this solitude except in extraordinary circumstances. All physical needs are met by the all-powerful Machine, and all audiovisual human communication is mediated electronically. Because the Machine serves them so loyally, humans have lost all but the slightest physical strength: main character is a “swaddled lump of flesh” whose Book of the Machine (a combination operating manual and religious text) would be lifted back up by the floor itself if she happened to drop it. On a rare trip outside her cell, she observes with horror an occasion when someone speaks without electronic mediation and another when an air-ship attendant touches someone in an attempt to steady his walk. This society’s aversion to

first-hand experience extends even to the academic intellectual pursuits that are its primary activities. “Let your ideas be second-hand”, says one lecturer, “and if possible tenth-hand, for then they will be far removed from that disturbing element - direct observation.” The story presents a society that, with all its needs met mechanically, is reduced to pushing buttons and speculating on history. The film *I, Robot* (Vintar, Goldsman, & Proyas, 2004) contains a scenario that, if not for Detective Spooner’s heroics, could have resulted in the situation described in “The Machine Stops”. In the film, all robots are “three laws safe”, having been programmed with the three laws of robotics:

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm.
2. A robot must obey any orders given to it by human beings, except where such orders would conflict with the First Law.
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Unfortunately, an artificial intelligence with advanced logical abilities concludes that the best way to keep humans safe, to keep *humanity* safe, is to keep them from ever entering an unsafe situation to begin with, enacted, significantly, by preventing people from leaving their homes. The bridged narrative between *I, Robot* and “The Machine Stops” demonstrates the idea that, even with well-intended logic, orchestrated freedom from want may not ultimately serve the best interests of those who are freed.

To Langdon Winner (1996/2004), “it is evident that, for better or worse, the future of human relations – indeed, of human being itself – are now thoroughly intertwined” (p. 53). Dyson et al (1996/2004) celebrate this intertwining, proclaiming “that cyberspace will play an important role knitting together in the diverse communities of tomorrow, facilitating the creation of ‘electronic neighborhoods’ bound together not by geography

but by shared interests” (p. 37). May (2002) cites Bill Thompson as exemplary in holding the belief that

...mutualism, rather than individualism, is (and has been) the way forward in the information society... Similarly, Charles Leadbeater suggests that the information society will usher in a new period when many social support mechanism will be organized electronically and transferred to mutual societies ‘owned’ by their members. (p. 98)

Although few would deny the value of communication on a subject of interest, whether dependent upon digital or pre-digital technology, concern could be voiced that “traditional” (that is, proximity-oriented) communities and relationships are being eroded in favor of “electronic” (that is, proximity-*independent*) communities and relationships. This hard-line view appears inaccurate and possibly out-of-date when one takes into account such familiar institutions as the NAACP, which has been concerned with building a national (and thus interest-oriented) community as well as strengthening local (and thus proximity-oriented) communities since its establishment in 1909 (“NAACP history”, 2009), and this just one very recent example in the history of long-distance community-building, which surely dates back as far as trade and travel. Nevertheless, digital telecommunications technology will doubtless have unique and possibly unforeseeable effects on community by any definition that should be examined as they occur, or sooner if possible.

Uglies (Westerfeld, 2005) demonstrates the possibility of simultaneous proximity-dependent and proximity-independent community. Main character Tally and her friends, all teenagers, depend on the city’s communication networks to get in touch and make plans for social events, but these social events always occur in person. In fact, parties – shallow, but still in-person socializing – are the primary social activities in the city, and, even though digital communication can take place all day and night, discussions almost

always seems to connect to a party or meeting of some kind. In *Snow Crash* (Stephenson, 1992), the immersive, virtual world known as the Metaverse is a social center for untold numbers of background characters, but the storyline still involves such “real-world” events as house parties and outdoor concerts. Even “The Machine Stops” (Forster, 1909), which presents the most extreme case of proximity-independent community, allows some in-person communication, albeit a rarely-used option. These works suggest that it is not a matter of proximity-dependent or proximity-independent, but a question of which one will dominate a person’s life.

Among those who view the prospect of the information society optimistically, there is a strong connection between the computerization of work and an increase of leisure time, broadly defined as activities that are subjectively preferable to work. Dyson et al (1996/2004), again, claim that “putting advanced computing power in the hands of entire populations will alleviate pressure on highways, reduce air pollution, allow people to live further away from crowded or dangerous urban areas, and expand family time” (p.37). Masuda (1990/2004) agrees, saying that “[t]he information society will aim for *the realization of time-value* (value that designs and actualizes future time), for each human being. The goal of society will be for everyone to enjoy a worthwhile life in pursuit of greater future possibilities” (p. 17, emphasis in original). He goes on to say that “[t]he most advanced stage of the information society will be *the high mass knowledge creation society*, in which computerization will make it possible for each person to create knowledge and to go on to self-fulfillment” (p. 20, emphasis in original).

Opposing this view are those who deny that computerized work is inherently better work. For Christopher Lasch (1987/2004), we would be wise to be “suspicious of

the rosy predictions of a 'postindustrial' society in which technological innovation will lead to an abundance of skilled jobs, eliminate disagreeable jobs, and make life easy for everyone. Everything we know about technological 'progress' indicates, on the contrary, that it promotes inequality and an unprecedented centralization of political and economic power" (p.290). Frank Webster (quoted in Kumar, 1995/2004) points out that "[m]any computer workers possess but an aura of skill; their daily work is little more than specialized clerical labor" (p. 111). These critics remind us that, like manual labor, computer work may be easily "Taylorized" (reduced to as little "brain work" and as few steps as possible) and "Fordized" (divided into parts so that no worker can understand the whole product), and that, like the factory shop floor, these processes may be deliberately incorporated into the design of the technology (e.g. programming languages, operating systems, network structures, etc.) so that almost no one can conceive of an alternative work structure (Kumar, 1995/2004, pp. 110-111).

On the question of computerized labor and happiness, Lasch goes even further to anticipate and decry full intellectual automation: artificial intelligence. "Now that scientists and engineers have devised machines that can allegedly think for themselves, contamination becomes a greater menace than ever before, since the condition of this so-called thinking is precisely that it operate at a level of abstraction where feelings play no part. The promise of the computer age, as it appears to its prophets and propagandists, is the hope that thought can divorce itself from emotion – the most intractable of the human limitation from which technology aspires to deliver us. The utopia of artificial intelligence – the final destination of our civilization – rests on the premise that thought

can dispense with the thinking self” (p. 294). Happiness, for Lesch, is nowhere to be found when artificial intelligence enters the scene.

The scenario presented in *Sleep Dealer* (Rivera & Riker, 2009) provides an especially interesting comparison of computerized and non-computerized work because characters in the film are using computers for labor that is fully manual in reality. The story follows a character named Memo, who, unable to cross the border from Mexico into the United States, finds work controlling a robot on a skyscraper somewhere in the U.S. construction site through a virtual reality interface in a Juarez “factory”.

Next to him are ... other machines being controlled by other people. One [person] might be in China, one might be in Malaysia, one might be in Brazil, and he’s in this workforce where he’s never able to know who his co-workers are... It’s a portrait of a totally alienated person. (“Reviewing science”, 2009).

To make matters worse, he is also paid very poorly compared to what an onsite construction worker would make. For Memo, computerization has preemptively eliminated any possibility of employee community, much less union organizing, as well as all but robbing him of an opportunity for economic upward mobility.

Sleep Dealer also touches on the role of artificial intelligence in the workplace. Luz, an Internet journalist who “instead of using a keyboard and a mouse to input her words ... connects her body directly to the network and ... uploads her memories” (“Reviewing science”, 2009). When she is composing text, she is often guided by suggestions from her computer (“Repeat the last ten seconds. Please tell the truth.”), leading one to wonder just who is writing the story. This situation recalls one in *Feed* (Anderson, 2002) when Titus spots girl at a club and tries to figure out what attracts him so powerfully. “Maybe it was her spine,” he thinks, “Maybe it wasn’t her face. Her spine was, I don’t know the word. Her spine was like ... ?” Uncannily, the feed suggests the

word “supple”, and Titus accepts it (p. 11). Without understanding it, he further reveals the dangers of having even a minor artificial intelligence system directly connected to one’s brain:

That’s one of the great things about the feed – you can be supersmart without ever working. Everyone is supersmart now. You can look things up automatic, like science and history, like if you want to know which battles of the Civil War George Washington fought in and shit. (p. 39)

These examples effectively illustrate Lasch’s concern that artificial intelligence eliminates any practical need for “the thinking self”.

Is the information society a rebirth of “traditional” values or a continuation of neglectful modern policies? Do in-person or electronic communities dominate? Is this society inherently materialist or intellectually enlightened? Is life made better or worse because of trends in computerizing work and the goal of artificial intelligence? These are all issues that have been examined in information science literature and SF works, and their incorporation could make these and other cultural considerations even more insightful.

Conclusion and Future Directions

The field of information society studies, like science fiction, is inherently future-oriented. Even if, as some claim, contemporary Americans (or Japanese, or Britons) are already living in one, the information society seems to have one foot in the present and one foot in the unknown journey through history ahead of us. The societal implications of this journey are already wide reaching, whether one takes as its flagship (or coalmine canary) trends toward information-oriented labor, changes in the flow of information, rapid adoption of new information technology, or some combination of all three.

Jason P. Vest (2007) has observed that the film adaptations of Philip K. Dick's SF writing, including Steven Spielberg's *Minority Report* and Ridley Scott's *Blade Runner*, have "exerted an acute, even overwhelming power over how we imagine the future will look, feel, and operate – in short, how the future will *be*" (p. xiv, emphasis in original). This statement can be applied to the best works of the entire genre, regardless of medium. Istvan Csicsery-Ronay, Jr. (2008) believes that science fiction "has, more than any other contemporary discourse, cultivated the motivating concepts of the global transformation of natural existence into a system of interlocking technical systems, the empire of technoscience [in which Csicsery-Ronay includes information technology]" (p. 161), pointing toward its effect on conceptions of the present as well. I have demonstrated in this paper that SF has a strong history of addressing topics that are significant to information society studies. By taking on these and other works as a body of parallel

texts, information scientists and theorists would greatly increase the depth, subtlety, and complexity of its scholarship. Much more work needs to be done for this transition to be successful, including thorough SF literature reviews on specific elements mentioned in this paper and elsewhere, educational cooperation between information science and English literature and/or film studies departments, and advocacy in support of the power and relevance of works of narrative fiction in a generally “nonfiction” field. These developments will give information society studies a renewed ability to concentrate on high-quality research and theory, while considering the human implications as science fiction has so expertly done throughout its long history.

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