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Doctor Who in an Exciting Adventure with the Information Society: Fears and Doubts of Technological Utopia in Selected Serials of the Original Series

Abstract: Science fiction is a genre uniquely suited to considering the implications of technological developments. The long-running BBC series *Doctor Who*, by nature of its longevity, presents the opportunity to investigate evolving attitudes towards emerging information technology. This paper analyzes three serials from the original run of *Doctor Who* and traces the development in the show's portrayal of the future of information technology (IT) from 1967 to 1975. I argue that early portrayals of futuristic information societies, in serials such as "The Wheel in Space" and "The Seeds of Death," take a mainframe-oriented view of IT's future and present a centralized, technocratic conception of the governments of the future. I conclude that the 1976 serial "The Deadly Assassin" dramatically reverses these earlier portrayals, demonstrating a perceptive awareness of the dawning of the microcomputer revolution and presenting a cynical take on the potential of technological advancement leading to technocratic utopia.

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Introduction

Science fiction has long provided authors with the opportunity to prognosticate future advancements in technology. Moreover, Carol Colatrella (1999) has argued that the "power of science fiction to track and to motivate political and social change" (p. 557) is as significant as its ability to imagine technological progress. No less a personage than H.G. Wells, one of the forefathers of the science fiction genre, identified a clear connection between his chosen literary genre and the field of social criticism when he stated that "the creation of Utopias—and their exhaustive criticism—is the proper and distinctive method of sociology" (qtd. in Collins, 2003, p.181). Indeed, imagining what technological capabilities may be available to future societies must necessarily lead to a consideration of how those societies will be reshaped by their technology. Science fiction, then, is an ideal vehicle for authors who wish to consider how technological developments will shape the future of society.

The long-running British science fiction television series *Doctor Who* is uniquely well-equipped to engage in considering how technology will shape potential future societies. The show's very premise enables it to engage with multiple potential futures: following the adventures of an eccentric time-travelling alien and his human companions, it shifts its setting completely at the close of each individual story, allowing it to repeatedly reimagine the future without being beholden to an established continuity. This flexibility of premise has enabled the show to remain popular with audiences for decades, as its ethos and characters can adapt to address the concerns of a changing culture. Moreover, by virtue of being so long running (the original series ran from 1963 to 1988, while the modern relaunch of the series has aired since 2005 and shows no signs of slowing down), it can track developments in contemporary culture as it imagines and reimagines the future of technology.

In this essay, I will perform a close reading of three serials from the original series of *Doctor Who*: "The Wheel in Space," "The Seeds of Death," and "The Deadly Assassin." These serials aired over years ranging from 1968 to 1976, just as the concept of the "information society" was being popularized by thinkers such as Daniel Bell, and all take as their settings futuristic societies whose political and economic structures are explicitly shaped by their use of advanced information technology. I will argue that these serials track with the rapidly evolving contemporary ideas of how information technology would develop, beginning with what A.S. Duff (1998) has identified as a mainframe-oriented assumption of highly centralized, technocratic application of IT

and transitioning to a position that foretells the rise of the democratization of IT through personal computing and is deeply sceptical of the potential of centralized IT to lead to effective governance. I argue that "The Deadly Assassin" represents a reconfiguring of *Doctor Who*'s relationship to technocratic ideals, driven by its growing awareness of the personal computer revolution and its democratization of information technology. This close reading of *Doctor Who*'s early portrayals of the Information Society will demonstrate that the show's portrayals of technology and its humanist politics are inevitably linked; though the first portrayals assume a technocratic utopian future fuelled by IT, the show's rapid adoption of futurist thinking about microcomputing ensured a return to an anti-authoritarian norm. Ultimately, the evolution in *Doctor Who*'s portrayal of the IT future between "The Wheel in Space" and "The Deadly Assassin" illustrates the inextricable connections between the microcomputer revolution and democratic, individualistic politics.

Fears of Utopia

Though previous *Doctor Who* serials, such as "The Sensorites" and "The Power of the Daleks," had been set in technologically advanced future human societies, they focused on societies whose technological prowess was directed towards space exploration and resource extraction. 1968's "The Ice Warriors" marked the show's first foray into imagining a future shaped by IT, via a simplistic moral tale of a computer-dependent base commander who must learn to make a decision based on his own intuition rather than relying on computerized risk-assessment metrics. However, Kit Pedler and David Whitaker's 1968 serial "The Wheel in Space" represents *Doctor Who*'s first extended portrayal of a human future shaped by advanced information technology. The Doctor and his companion Jamie materialize on an abandoned ship in deep space, at an unspecified date in Earth's far future. Their exploration of the ship hints at the significance of information technology to the former crew. Amongst images of large computer banks dominating the ships cabin, and glimpses of a small robot that maintains the ship's functions in the absence of a crew, the Doctor makes an important discovery: a "food dispenser" that produces "bland, white cubes" to provide nourishment (Pedler & Whitaker, 1968). Notably, these cubes are neither as flavourless nor as lacking in nutrients as they appear, as they are "encoded" by the dispenser with the flavour and nutritional value of whatever food the user desires. Bill Martin (2004) argues that a key aspect defining an information society is the presence of "an economy based on ideas and intangibles or on physical entities that embody both" (p. 6). Through the food dispenser, Pedler and Whitaker render this concept literally, presenting a technology that meets the essential needs of life by treating the

physical characteristics of flavour and nutrition as information to be stored and transferred.

Pedler and Whitaker expand upon this early hint of a society organized around the production of information when the Doctor and Jamie are taken on board the titular Wheel, a space station manned not by the pulp-hero space adventurers of earlier serials, but by a crew of scientists, communications specialists, and researchers. In the words of one member of the crew, the Wheel is "a radio-visual relay station for Earth, a halfway house for deep-space ships, a Space research station, [and a] stellar early-warning station for all types of space phenomena" (Pedler & Whitaker, 1968). Pedler and Whitaker repeatedly emphasize the primacy of information and information specialists in their conception of humanity's future. For instance, when the crew of the Wheel is first depicted, they are on the station's bridge, gathered around not a military commander, but a "Communications Officer" (Pedler & Whitaker, 1968), and even the ship's ranking officer is referred to by the bureaucratic title "Controller" rather than the traditional military title "Captain." When the crew offers Jamie a guided tour of the Wheel, they show him a library (called the "Parapsychology Library" in a seemingly meaningless bit of technobabble) and a botanical research center before even mentioning the presence of the station's laser weapon systems. At every stage, the Wheel's status as a center for the production and transfer of information is emphasized before any military or exploratory purposes.

Pedler and Whitaker do not provide an extensive overview of the political situation of its future human society, but the hints they offer suggest a near-utopian state that has largely transcended traditional political squabbling. As noted previously, the existence of computer generated food implies a state of post-scarcity. Throughout the serial the crew of the Wheel refer to Earth as a distinct political entity, suggesting a one-world government. While an unusual amount of time is spent "building the world of the Wheel" (Sandifer, 2011a, para. 12), the only mention of political conflict is the Controller's suggestion that fringe groups on Earth who oppose the space program may attempt to infiltrate the station. Even this threat is undercut by the scepticism expressed by the other crew members, the fact that no sabotage comes to pass in the course of the serial, and the slow descent of the Controller into paranoid lunacy as the plot progresses. In addition to the minimal discord amongst humans, it is implied that extraterrestrial threats are not part of this future world's purview: when the Controller elects to use the station's weapon systems against a ship he believes to pose a threat to the Wheel, he declares that the use of weaponry will constitute a "sight rarely seen by human beings" (Pedler & Whitaker, 1968).

A.S. Duff (1998) notes that this vision of a technocratic, centralized government structure is a natural consequence of theorizing from a point in history where the future of IT was presumed to be in the development of more and more powerful mainframe computers. Without anticipating the "microcomputer revolution" that led to widespread popular use of personal computers, speculation about a society based around the IT of the future proceeds from the assumption that the "academic and governmental applications" (Duff, 1998, p.378) typically associated with large mainframe computers would become increasingly technologically advanced. From this basis, it is not a large imaginative leap to a technocratic government. James Beninger has argued (1986) that information processing is an essential precursor to centralization of control, as it is only by subordinating the democratic concerns of the individual to the needs of the broader polity that it can be made possible for a computerized bureaucracy to "to maintain large-scale, complex social systems" (para. 25).

The failure to foresee the rise of the personal computer leads "The Wheel in Space" to one of its most interesting elements: the introduction of the Doctor's new companion, Zoe. Though her position is not clearly defined, Zoe's role on the Wheel seems to encompass providing scientific and mathematical advice for any situation any member of the crew might encounter. One of the Wheel's officers describes Zoe to the Doctor as the crew's "second opinion" (Pedler & Whitaker, 1968) after the central computer. She has a perfect memory, an encyclopedic level of scientific knowledge, and the ability to rapidly carry out complex calculations in her head: essentially, she is a personal computer in human form, with a head "pumped full of facts and figures which [she can] reel out automatically when needed" (Pedler & Whitaker, 1968). These special abilities are not unique to Zoe, but are specified as the result of her education at an institution called the "Parapsychology Unit" (Pedler & Whitaker, 1968). Sandifer (2011a) describes Zoe as an "arch-technocrat" who represents "1968's view of how information processing would work in the future" (para. 13). With a vision of humankind's IT future based around the presence of highly advanced, centralized, non-user friendly mainframe computers, Pedler and Whitaker assumed that humans themselves would become more computationally advanced in order to cope with advancing technology.

While the depiction of Zoe's role in the future may have proved less-than-apt as prognostication, it remains an apt metaphor for concerns that persist to this day about the role IT plays in shaping the way humans think and behave. Just as Nicholas Carr (2010) has argued that modern attachment to IT is altering brain patterns and potentially diminishing essential human qualities such as creativity, Pedler and

Whitaker's script is filled with concerns that Zoe's adaptation to the IT of the Wheel has compromised her essential humanity. A crew member questions her capacity for empathy, declaring her "all brain and no heart" and questioning whether she can "ever feel anything emotional" (Pedler & Whitaker, 1968). However, the most pertinent concern about Zoe's adaptation to technology is raised as the alien incursion that drives the plot of "The Wheel in Space" ramps up, with Zoe and others wondering whether a "blind reliance on facts and logic" (Pedler & Whitaker, 1968) dulls the human ability to adapt to circumstances. Zoe laments that she has "been created for some false kind of existence where only known kinds of emergencies are catered for" (Pedler & Whitaker, 1968). Indeed, the entire crew of the Wheel is unable to comprehend and respond to the alien attack the Doctor warns them against, dismissing the idea of an unknown force attacking for unknown reasons as illogical. This inability to operate outside of the routines of their established system leads to the deaths of a large portion of the crew.

Pedler and Whitaker underline their theme of technology leading to a loss of key aspects of human nature through their choice of villains: the Cybermen. Among the most frequently recurring villains of *Doctor Who*, the Cybermen are themselves an extrapolation of the contemporary science of cybernetics. Cybernetics is a field of study built around the insight that "all manner of actions performed by humans, animals, or machines could be described as the transmission and processing of information" (Collins, 2003, p. 184). The Cybermen take this connection between the actions of human and machine to its extreme, logical end, integrating their bodies with robotic elements and having their minds "neurosurgically altered" (Pedler & Whitaker, 1968) to remove their emotions and enhance their efficiency. Throughout the serial, Pedler and Whitaker's script "overtly parallels Zoe's situation to the Cybermen's" (Sandifer, 2011a, para. 14), juxtaposing scenes of Zoe expressing fears that her excessive integration into her society's IT infrastructure is removing her human nature with scenes of the Cybermen ruthlessly killing and enslaving members of the Wheel's crew in the furtherance of their goals. These parallels between the Cybermen and the IT dependent humans are further emphasized by the introduction of the Cyber-Controller, a centralized consciousness that coordinates the actions of the Cybermen, similar to the centralized computing functions of a mainframe computer.

Doctor Who returned to the setting of a technocratic human society powered by advanced IT just one year later in the serial "The Seeds of Death." The Doctor, Jamie, and Zoe materialize at another unspecified period in Earth's future, this time finding themselves on the planet itself. "The Seeds of Death" is much more explicit in

depicting the influence of IT on the culture of its future Earth. The serial opens before the Doctor's arrival, portraying what begins as an ordinary day for the employees of T-Mat, a global organization that coordinates the transport of goods around the world via teleportation. With T-Mat, Hayles expands upon the symbol of the food dispenser "The Wheel in Space," depicting a world whose material needs are met through a centralized, computerized economic system that treats the physical goods it transfers as information. T-Mat is presented as a global, centralized system that is responsible for managing trade and travel across the Earth, a fact that is emphasized by the serial's first words, spoken by a computerized intelligence that monitors T-Mat's activities:

> Bombay Tokyo shipment activated. Bombay sending now. Tokyo receiving now. Dispatch completed. New York to Moscow delayed. Moonbase clearance awaited. Stockholm Washington personnel transportation. Stockholm sending now. Washington receiving now. Dispatch completed. Non-arrival shipment of synthetic protein New York to Moscow. Moonbase clearance awaited. (Hayle, 1969)

Once again, the writers of *Doctor Who* take the mainframe computer as the basis for their conception of the future of IT, with Hayles explicitly noting the technocratic utopian state of the Earth where Pedler and Whitaker were content to simply imply it. The efficiency of the technocrats managing T-Mat is made clear almost immediately, when a recently promoted mid-level functionary mismanages a T-Mat transfer. The functionary's errors result in him being derided as a "lunatic" who should never have been promoted, entirely because they lead to T-Mat's deliveries being a mere "five minutes behind schedule" (Hayles, 1969); clearly, both the computers and the technicians responsible for T-Mat are typically extremely efficient.

As a result of the combination of teleportation technology and highly efficient, IT-fueled technocratic management, the Earth of "The Seeds of Death" is shown to have reached a state where the material needs of the world's population are entirely met. However, as in "The Wheel in Space," Hayles litters his script with expressions of concern that humanity may come to be excessively reliant on its information technocracy, to the extent that their essential nature may be altered by the interaction. These concerns first manifest themselves in the character of Professor Eldred, a rocket scientist whose career in the space program fell apart when the advent of T-Mat dulled humankind's ambition to travel in outer space. Eldred laments that life was "made too easy by T-Mat," a technology that, for all its effectiveness, has "as much sense of adventure as a synthetic carbohydrates factory" (Hayles, 1968). The sense of complacency identified by Eldred recalls Zoe's concerns about lacking

appropriate human emotions in "The Wheel in Space." Hayles takes the concern about a fundamental alteration of human nature further, applying it to the entire polity of Earth, which becomes complacent and reliant on T-Mat as a result of the increased convenience it brings to their lives. In Hayles' script, it is humanity's complacency in the face of its advanced technology that leaves them vulnerable to attack by threatening outside forces.

Given the primacy of T-Mat to Hayles' setting, it is only natural that the serial's conflict concerns an attack on the T-Mat system by the rather generic alien conquerors the Ice Warriors. As the conflict of "The Seeds of Death" escalates, Hayles' script continues its pattern of expressing the concerns of Pedler and Whitaker's earlier script more explicitly. Where "The Wheel in Space" depicts a human outpost that is vulnerable to invasion because its reliance on logic and established knowledge impairs its ability to respond to an unanticipated crisis, Hayles' story shows that the complacent population of Earth is utterly unable to function when its centralized and computerized technocracy is temporarily disabled. When the serial's villains, the Ice Warriors, seize control of the moon base that serves as a satellite relaying T-Mat's information transmissions, the economic situation on Earth rapidly degrades. Within a matter of days the T-Mat central computer reports that all of Earth's major cities are suffering "major food shortages" (Hayles, 1969). The technocrats trying to maintain T-Mat's emergency services go so far as to say that "[w]ithout T-mat, millions are going to die" (Hayles, 1969), suggesting that there is a minimal amount of local economic activity and government to deal with a crisis that is beyond the reach of Earth's central governing agencies. Hayles emphasizes this downside to reliance on advanced technology that "primitive areas" (1969) are better able to cope with the absence of T-Mat than residents of major cities, presumably because their distance from the centralized economic structure requires them to look after their own needs.

Both "The Wheel in Space" and "The Seeds of Death" portray futures where the people of Earth have organized their society around their advanced information technology. While it is suggested that these advanced societies have been able to cast off political strife and material want, both Pedler and Whitaker and Hayles display ambivalence about their technological utopias. Both repeatedly suggest that the sort of centralization and technological dependence they portray in their serials compromises essential human characteristics such as empathy, adaptability, and ambition. With "The Seeds of Death" Hayles goes further, portraying a human race so dependent on its IT-powered technocracy that humanity is unable to survive without it for even a few days. In both cases, it is only the mercurial, individualist presence of the

Doctor that awakens the humans to what they have lost, enabling them to defeat their threats by thinking outside of the box they have put themselves in. "The Wheel in Space" closes with Zoe abandoning her prescribed role in the technocracy in favour of travelling through time and space with the Doctor and Jamie, while "The Seeds of Death" sees the rocket science of Eldred restored to prominence, proposing a revamped space program while warning against excessive reliance on T-Mat technology.

Notably, both "The Wheel in Space" and "The Seeds of Death" accept that the advancement of IT and the centralization of political and economic control will lead to functional, utopian societies, despite their concerns about the effects of their technocratic utopias on the essential nature of the humans who live in them. Both serials close with the Doctor having given the societies he encounters powerful reminders of the traits they have lost through their integration into their own IT infrastructure, but it is heavily implied that both societies will use the lessons they have learned to augment their existing social structures, rather than upend them. For instance, "The Seeds of Death" closes with the chief technocrats behind T-Mat preparing to re-establish regular service; with even the former T-Mat sceptic Eldred simply suggesting that they implement a fleet of rockets to maintain service in the event of future disruptions. The vision presented in both serials is of a human race that is invariably shaped by its IT, responding to the development of increasingly powerful central computers by adapting to service the functioning of these mainframes. Though the writers of both serials are ambivalent about the effects of their IT-pervaded, top-down technocracies on the character of the humans that live under them, the writers both proceed from the premise that advancements in IT will lead to a top-down governing structure that eliminates political conflict, with the computational capability to manage the economy of the Earth so efficiently as to eliminate scarcity.

Doubts of Utopia

By the time *Doctor Who* returned to the setting of an advanced society shaped by its relationship to information technology in 1976's "The Deadly Assassin," the show had gone through multiple changes in creative teams, companions, and even lead actors. Despite all these behind-the-scenes changes, there are many similarities between the portrayal of an IT-pervaded society in "The Deadly Assassin" and its late-1960s predecessors. All three serials depict societies where the advancement of IT has led to a technocratic central government. However, Robert Holmes' script for "The Deadly Assassin" is far more concerned with the political implications of such a

technocratic system and far more cynical about the prospects of IT-driven technocracy producing Utopian conditions.

"The Deadly Assassin" is notable for being the first serial in the history of *Doctor Who* to take the Doctor's home planet, Gallifrey, as its setting. Here, the inner workings of Gallifrey's elite rulers, the Time Lords, are portrayed in detail for the first time. The Time Lords had debuted in "The War Games," just two serials after "The Seeds of Death," and they were firmly established as "generic god-like technocrats" (Sandifer, 2011b, para. 93), following the model of IT technocracy established by Pedler and Whitaker and further developed by Hayles. The Time Lords were technocrats on a much greater scale, using their mastery of time travel to ensure the smooth progression of history throughout the universe (Sandifer, 2011b): information managers on the grandest possible scale. Though their intentions were generally portrayed as benevolent, they also echoed the concerns seen in "The Wheel in Space" of habituation to technocracy and technology dulling the ability to empathize. At the close of "The War Games," the Time Lords help the Doctor restore a group of kidnapped soldiers to their proper time lines, but they also take his companions from him and return them to their time lines, erasing their memories of the Doctor in the process. Then, to punish the Doctor for violating the Time Lords' time lines in the first place, they remove his ability to travel through time and space and exile him to Earth, ensuring that viewers will feel ambivalence about the role of the Time Lords by having them attack the very premise of the show (Hulke & Dicks, 1969). Subsequent appearances leading up to "The Deadly Assassin" continued in this vein, portraying the Time Lords as ruthlessly efficient, emotionally detached technocrats.

In portraying the inner workings of Time Lord society for the first time, Holmes deliberately humanizes them, taking explicit inspiration for their culture from the "structure of British universities" (Sandifer, 2011b, para. 16). Moreover, as Sandifer (2011b) has argued, Holmes draws further inspiration for the Time Lords from both the British House of Lords, in its aristocratic isolation from the people it governs, and the American presidential system, particularly through its overt allusions to conspiracy theories surrounding the Kennedy assassination. The Time Lords are simultaneously a bickering aristocratic legislature, too busy debating procedural arcana to notice what happens right in front of them, and a scheming, corrupt gaggle of unaccountable technocrats, whose will is administered through the secretive and pointedly named Celestial Intelligence Agency. Holmes allows these parallels to contemporary Western society to define the culture of the Time Lords, rather than providing diegetic historical background to explain Gallifrey's political state. As such, Holmes invites viewers to

interpret the culture of the Gallifreyans as a reflection of Western culture, with a portrayal of the strengths and weaknesses of technocracy more explicitly political than those of his predecessors.

"The Deadly Assassin" finds the Doctor returning to Gallifrey after having a premonition of the assassination of the president. After he fails to prevent the killing, he finds himself framed as the assassin and sentenced to death, and he must find a way to clear his name and catch the real killer before his execution. The Doctor's efforts to clear himself involve him interacting with both the IT infrastructure and the political system of Gallifrey. The structure of the Doctor's investigation allows Holmes to portray the fantastical technology and all-too-familiar political culture of Gallifrey in great detail without distracting from the conspiracy plot that drives "The Deadly Assassin."

Holmes' portrayal of Gallifrey's IT eschews metaphors of material goods treated as information in favour of a more literal focus on how the Time Lords manage information. The most notable aspect of Gallifrey's IT is the Matrix, a data bank that recalls Vannevar Bush's (1945) prediction that a future science may implement new ways to "produce, store, and consult the record of the race" (p. 13). Gallifrey's Matrix stores a record of the race in the most literal sense: it is comprised of "trillions of electrochemical cells" that form the "depository of departed Time Lords" (Holmes, 1976). When a Time Lord is "at the moment of death, an electrical scan is made of the brain pattern, and these millions of impulses are immediately transferred to [the Matrix]" (Holmes, 1976). By compiling and cataloguing the collected knowledge of every departed member of their society, the Time Lords are able to "monitor life in the capital" and "use all this combined knowledge and experience to predict future developments" (Holmes, 1969). In conceiving the Matrix, Holmes mixes the mainframe-centered conception of the future of IT portrayed in "The Wheel in Space" and "The Seeds of Death" with elements of the coming revolution in personal computing, gesturing towards the modern "conception of the information society as a 'wired-up world'" (Duff, 1998, p. 397). The Matrix itself is still explicitly a centralized, mainframe-type piece of technology, only for the use of a technocratic elite: the official in charge of maintaining it reveals that access keys to the database are "only issued to High Councillors" (Holmes, 1976). At the same time, its creation explicitly relies on a network of organic microprocessors—the very brains of Time Lords—in order to collect its data.

This tension between the centralized, top-down control of the IT infrastructure and the network of microprocessors that gather its information is mirrored in Holmes' portrayal of Gallifrey's political culture, which is at once a technocracy controlled by a group of intellectual elites and a quasi-democracy. On the democratic side, the

Gallifreyans have an elected president: in fact, the conspiracy at the heart of "The Deadly Assassin" revolves around the Doctor's arch-enemy the Master ensuring his co-conspirator's election to the presidency in order to obtain access to the artifacts of the Time Lords. Furthermore, the ruling class of Gallifrey is repeatedly implied to be accountable to the people of Gallifrey: their government functions are held in a building called the Panopticon, where all their actions are recorded by a "public register camera" and transmitted across Gallifrey, and Cardinal Borusa, a high ranking Time Lord, makes reference to the need for the Time Lords to maintain "public confidence" (Holmes, 1976). However, despite these democratic trappings, political control of Gallifrey is clearly held by the technocratic elite that controls the IT infrastructure. The presidency, despite being the temptation which drives Chancellor Goth to join with the Master in his conspiracy, is candidly described to the Doctor as being distinguished from the other Time Lords only by "ceremonial duties" (Holmes, 1976). On top of this, the office of the presidency can only be held by a "Time Lord, usually from some senior position" (Holmes, 1976), and one can only become a Time Lord by graduating from the Gallifreyan Academy with high distinction in a wide range of scientific fields. For instance, the Time Lord responsible for maintaining the Matrix declares that in order to program its computational devices one would have to be a "mathematical genius with a phenomenal grasp of applied Excitonics" (Holmes, 1976). This distinction in Gallifreyan society is seen in the interactions between the Time Lords and the non-Time Lord Gallifreyans who work as guards in the capital, as the Time Lords are responsible for coordinating all security functions, while the guards themselves have no agency, simply carrying out orders unquestioningly.

Holmes goes far further than either Pedler and Whitaker or Hayles did in considering the political implications of a society that is centrally ordered by powerful information technology that only elite scientists have access to. Holmes' vision of a technocratic IT-pervaded utopia is set even further apart from that of his predecessors by the fact that the Time Lord technocracy he portrays is utterly dysfunctional. At every stage, the Master's scheme is able to proceed due to the shortcomings of both the supposedly infallible IT infrastructure of Gallifrey and the technocrats responsible for maintaining it. The Master is able to evade suspicion from the Time Lord security apparatus because all record of his existence has been erased from the databanks of Gallifrey, due to an elite fear that public knowledge that a Time Lord had turned renegade and repeatedly attempted to conquer the galaxy would harm public confidence in "the Time Lords and their leadership" (Holmes, 1976). With crucial information removed by political meddling, the computational apparatus of the Matrix is unable to perform its key function and predict developments in the capital.

Likewise, the advanced monitoring technology found in the Panopticon fails to capture a record of the assassination due to technocratic incompetence. When Runcible, the technocrat responsible for the operation of the public register camera system—derided by the Doctor as "Runcible the fatuous" (Holmes, 1976)—notes that his camera technician has not sent him a routine signal confirming that the system is operational, he is too busy trying to save face after being publicly ridiculed by a higher ranking Time Lord to investigate. As a result, he does not discover that his technician has been murdered and the public register camera disabled until well after the assassination has taken place and the investigation is underway. Where "The Wheel In Space" and "The Seeds of Death" portrayed technocrats that held such mastery over their IT systems that they had forgotten how to function outside of them, "The Deadly Assassin" portrays technocrats who are not even capable of effectively managing the massive amount of information their technology harnesses.

Holmes also recalls Hayles' concerns of sufficiently advanced IT breeding complacency when it is revealed that the Master is able to manipulate the Matrix to prevent the actions of his co-conspirator, who remains in the records of Gallifrey, from being predicted with accuracy: in the face of assurances that the Matrix is too complex to be secretly manipulated, the Doctor scoffs, leading to the following exchange:

> DOCTOR: Child's play to the Master. Do you think this stuff is sophisticated? There are worlds out there where this kind of equipment would be considered prehistoric junk.
>
> SPANDRELL: What is the Master like on mathematics?
>
> DOCTOR: He's brilliant. Absolutely brilliant. He's almost up to my standard. (Holmes, 1976)

The technocratic incompetency of the Time Lords extends beyond not being able to effectively manage their IT: like the humans of "The Seeds of Death," the Time Lords confidence in the perfection of their technological infrastructure has led them to lose their ambition and cease to strive for further advancement. In the Doctor's words, the Time Lords "live for centuries and have as much sense of adventure as dormice" (Holmes, 1976). It is only the Doctor and the Master, two Time Lords who have rejected the complacency of Gallifreyan society in favour of exploring the universe, who are able to see beyond the prescribed applications of the Matrix.

It is in their manipulations of the Matrix that Holmes provides the strongest intimation of the coming microcomputer revolution, with its "quantitative, 'bottom up'" (Duff, 1998, p.387) approach to the management of information. Recalling once again the forecasts of Vannevar Bush (1945), this time his suggestion that one day it may be possible to approach the information record not through the senses, but by a more directly established path, the Doctor elects to connect his microcomputer—his brain—directly to the Matrix, in order to determine who is helping the Master manipulate Gallifrey's records. In a development prefiguring the *Matrix* films of the Wachowski siblings, the Doctor's consciousness enters a world within the Matrix that is composed by the collected minds of the departed Time Lords. Moreover, he discovers that the Master and his co-conspirator have also linked their minds to the Matrix in order to manipulate its records and control its output of predictions. There, within the Matrix, the Doctor and the Master engage in a battle of wills, where the strength of their mental output can directly manipulate the reality of the world within the Matrix. Rather than simply act as passive vessels transmitting information to a centralized mainframe, the Doctor and the Master presage the information revolution of the Internet by actively shaping the "record of the race" (Bush, 1945, p. 13) from the bottom up. As these bottom-up applications of IT enable both the Master's subversion of the Gallifreyan technocracy and the Doctor's ability to unmask the Master's co-conspirator and stop his plot while the Time Lord's security apparatus is helpless, Holmes' political point is clear: a top-down, technocratic IT structure is not simply undesirable, it is ultimately unworkable. A bottom-up, democratic approach must prevail.

Holmes' portrayal of a failed technocracy reveals a fundamentally different conception of the interaction of humans and information technology than that of its predecessors. Pedler, Whitaker, and Hayles all proceed from the assumption that as IT advances, human nature will adapt to better assist the functioning of their IT infrastructure, for better or for worse. Holmes, somewhat cynically, suggests the inverse: that IT can only function up to the level of effectiveness of the individuals responsible for administering it and, as a result, an IT-driven technocracy would not achieve the effectiveness promised by its processing power due to the persistence of the negative aspects of human nature (albeit, a human nature portrayed by aliens!). At every step in "The Deadly Assassin," the shortcomings of the Time Lords themselves prevent the perfect functioning of their IT infrastructure. The venality of the Time Lord politicians leads them to remove crucial information from the Matrix to save face: even at the serial's close, with the shortcomings of their system exposed, Cardinal Borusa declares

that "the story is unacceptable" and that the Time Lords must "adjust the truth" (Holmes, 1976) of what happened in order to save face. Runcible, the official in charge of ensuring oversight of the political process, fails in his duties due to a desire to save face. Chancellor Goth, the Master's co-conspirator, enables the Master's plot due to an ambition to rise to the highest rank of Time Lord society, even if it is merely a ceremonial position. Even the Master allows his otherwise ruthlessly logical plan to be undone because of his pettiness: not content to merely take over the government of Gallifrey, he chooses to frame the Doctor because he "must see [him] die, chained and dishonored" (Holmes, 1976), thus ensuring that the one person capable of foiling his scheme is there on the scene as he executes it. Hayles, Pedler, and Whitaker fear that once IT is sufficiently advanced, humans will become complacent beings of pure logic; Holmes, in a true manifestation of *Doctor Who*'s "satirical and even anarchic leanings" (Charles, 2008, p. 453) during his tenure as Script Editor, scoffs at the very idea that humans could be driven purely by logic and, by extension, that advances in the computational capacity of IT could possibly result in a system that satisfies the needs of all people. Contra Beninger (1986), Holmes suggests that ignoring the "particularistic considerations" (para. 25) of the citizenry leads not to the effective administration of a system serving the needs of the polity, but to a system focused on the particularistic concerns of its own administrators. In Holmes' view, as long as individuals have their own divergent agendas, a technocratic system governed by a technological elite is more likely to serve the interests of that elite than of society as a whole, and ineffectively at that.

Where "The Wheel in Space" and "The Seeds of Death" close with the technocratic systems strengthened by the Doctor's intervention, "The Deadly Assassin" ends with the Time Lords diminished: the Doctor, previously a rogue element who was manipulated and looked down upon by his people, is elected Lord President of Gallifrey, and immediately abandons his post to resume his explorations of the universe unmolested, no longer subject to the whims of Time Lord technocracy. Holmes' reconfiguring of *Doctor Who*'s portrayal of IT and its effects on the political system in "The Deadly Assassin" resulted in a "subversion of the Time Lords" (Sandifer, 2011b, para. 29), not just within the show's narrative but also extra-diegetically, fundamentally altering the standard approach the show's writers would take when portraying technocracies. In their previous appearances, the technocracy of the Time Lords had been depicted along the lines of the model set out in "The Wheel in Space" and "The Seeds of Death:" they were purely logical technocrats, undertaking godlike interventions when necessary to right the course of history. Following "The Deadly Assassin," their portrayal consistently shows what Phillip Sandifer (2011b) has described

as "fealty to the squabbling pettiness of human nature" (para. 116), as their interventions in the affairs of the universe are in service of the personal agendas of whatever technocrats happen to currently control the levers of power on Gallifrey.

This newfound cynicism about elite control of IT-infrastructure even extends to the Doctor's own top-down interventions. In a fitting coda to "The Deadly Assassin," the very next serial, "The Face of Evil," portrays the Doctor visiting a planet colonized by the crew of a ship he had helped in the past and discovering that a "mistake [he] made when [he] was here before" (Boucher, 1977) has resulted in the ship's central computer becoming sentient and structuring the human society around fulfilling its emotional and material needs. The Doctor sets to work dismantling the IT-driven technocracy he had inadvertently established years before, and restoring control of the society to its citizens, rather than its computerized bureaucracy.

Conclusion

Between the debut of "The Wheel in Space" and the conclusion of "The Deadly Assassin" just eight years later, a fundamental shift occurred in *Doctor Who*'s relationship to technocracy, driven by a fundamental shift in its understanding of the future of information technology. In less than a decade, *Doctor Who* transitioned from an uncritical assumption that the development of advanced IT would lead to technocratic utopia to an outright rejection of both the efficacy and the propriety of top-down, technocratic intervention, presaging the bottom-up revolution of the Internet age.

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