Learning from COVID-19: Virtue Ethics, Pandemics and Environmental Degradation:

A case study reading of *The Andromeda Strain* (1971) and *Contagion* (2011)

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Abstract

This paper uses virtue ethics to discuss the COVID-19 outbreak, Hollywood science-fiction/pandemic films, and the environmental crisis. We outline the ideas of *hubris* and *nemesis* and argue that responding to the COVID-19 pandemic requires that we develop virtues. We will explore these ethical issues through an eco-reading (Hiltner 2018) of two popular films cinematic representation of pandemics, *The Andromeda Strain* (1971) and *Contagion* (2011). Fictional narratives are particularly adept at celebrating the moral and intellectual virtues of individuals (as is standard in Hollywood cinema) and dramatizing the tensions inherent in human scientific and technological civilisation. Using examples from our texts and with reference to COVID-19, we begin with a discussion of virtues and vices, both individual and collective, we then explore the concept of *flourishing* and apply this framework to collective action problems such as climate change and COVID-19. Thus, science fiction can provoke new forms of environmental philosophising and ethical engagement, while addressing the most important challenges facing humanity at present.

> *Virtue may be defined as a habit of mind (*animi*) in harmony with reason and the order of nature.*
>
> – Cicero, *De Inventione*

Introduction

In Greek myth, Hubris provokes Nemesis. It was Nemesis that led Narcissus to his death—falling in love with his own reflection in a pool—as retribution for his vanity. It is hubris—the vice of pride—that is most characteristic of humanity's attitude towards the Natural world. COVID-19 (as we commonly call the severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2]) suggests that Nemesis might not be far away.

To talk about hubris, is to talk about vice, i.e. to adopt the language of virtue ethics. Virtue ethics has enjoyed something of a renaissance in recent decades and has begun to be applied in environmental contexts. Traditionally, virtue ethics is concerned with character, with the way our character informs our actions, and the way in which character can help us achieve a good. Environmental virtue ethics stresses the

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importance of a healthy natural environment for human flourishing. The abominable and self-destructive treatment of the natural environment arises in some ways from a defect in our characters, from our vices. This is not to say that political choices, market forces, and other systemic factors have no role. They too instantiate vices and encourage vicious behaviour. Vices are generally considered to harm the person who possesses the vice and to harm those around them too.

This paper discusses virtues and vices in relation to the COVID-19 pandemic and uses two films—*Contagion* (2011) and *The Andromeda Strain* (1971)—to explore these issues. First, virtues and vices are briefly introduced. Our perspective on virtue theory is predominantly Aristotelian, though our discussion is informed by recently developed environmental virtue theories. Following that we explore the ways in which COVID-19 has illuminated both individual and collective vices. We use *Contagion* as a guide for this discussion. Following that we turn to virtues, using *The Andromeda Strain* as a guide. We bring these discussions together in a discussion of the ways in which the virtues explored can and should frame the shape of society, either post-COVID or as we learn to live with the disease. This discussion then leads us to the importance of humility in terms of our place in the natural environment and the importance of narratives we tell about that place. The two cinematic texts chosen both celebrate and question the dominant narratives of Western civilisation—raising questions that the real-world COVID-19 pandemic has made all the more urgent.

Virtue and Vices

Virtues and vices are derivative—insofar as a practice helps you achieve the good, it is virtuous; insofar as it hinders your achieving the good, it is vicious. Virtue ethics approaches are adept at determining which responses are appropriate, and which inappropriate. Conceptually, when we want to discuss a virtue or a vice, we will look for a stable trait of character, not just a particular act. So, for example, I might act in a brave manner once, but this would not mean I have the virtue of being brave. Similarly, I might act in a gluttonous way, but if this is out of character, we would not describe me as having the *vice* of gluttony.

Additionally, virtue ethics is usually concerned with some conception of the Good. The goal of character and actions is to achieve this good—the *telos*. Institutions, practices and systems should also aim towards this telos. The good is variously conceived, depending on the theory. For Aristotle, it was *eudaimonia*, usually translated as "happiness" or "flourishing." What counts as flourishing can be known and should be the goal of one's life. Flourishing is the telos as it is considered to be the only unconditional value in Aristotelian virtue ethics, and virtues are traits of character or practices that help in pursuit of the good.

Virtues are tendencies or dispositions that people possess (though we might also apply virtue to the theory of political institutions, corporations, and economic and political systems). "A virtue is an acquired human quality the possession and exercise of which tends to enable us to achieve those goods which are internal to practices and the lack of which effectively prevents us from achieving such goods" (MacIntyre 1981, 222). A virtue is a trait of character, or capacity or power—it is a specific excellence. "The virtue of a thing or being is what constitutes its value, in other words, its distinctive excellence" (Comte-Sponville 2003, 2). There are myriad virtues and they will often be intertwined. Examples of these would be prudence, humility, and temperance.

By contrast a vice is usually considered to harm the person possessing the vice, and harm other people or the wider community. Vice is seen "as contradicting and eventually undermining reason, hence destroying our ability to understand our proper place in the world and act morally" and "cutting us off from reality or at least from what is most important in life" (Cafaro 2005, 137). Those who are dominated by their vices, or a society that is predominantly vicious in nature, will eventually regret acting on their vicious impulses. Similar to virtues, there are multiple vices, and just like virtues, they are intertwined. Examples of vices include imprudence, hubris, and self-indulgence. In the next section, we discuss Steven Soderbergh's 2011 film *Contagion* in relation to both COVID-19 and vice.

Contagion

Pandemic films can be read as focusing on human virtue and vice, both individual and collective. Whilst pandemics undermine the possibility of human flourishing, fictional pandemics can enhance the possibility of flourishing by providing their audiences with a "dress rehearsal" for real events. Of course, pandemics are caused by the flourishing of something inimical to humanity, as we will discuss below. As such, stories about pandemics can act as salutary reminders of our proper places in the world. They dramatise tensions between human scientific success and the unexpected fragility that novel diseases reveal in our societies. Stephen Soderbergh's *Contagion* combines traditional personal vices with scientific collective vices in its opening scenes, and offers a cinematic point of reference for considering the impact of a virus on society.

Contagion (2011) tells the story of a pandemic caused by a respiratory virus called MEV-1 in a realistic manner. It follows a variety of characters to provide a panoramic view of the impact of a virus on contemporary society. Thematically and stylistically, *Contagion* is a kind of sequel to *Traffic* (2000). Both movies employ a stripped-down realist visual style and hyperlink narrative to emphasise the immediacy of their topic, and to show the complex relationships that link distant places and government attempts to respond to the threats against social order and public health that result as greed overwhelms the economic opportunities created by global networks. The audience initially experience the pandemic from a domestic perspective, as patient zero, Beth Emhoff (Gwyneth Paltrow) returns to her family in Chicago. Following her death and the spread of the virus, we watch as the centres of disease control and various scientists and other officials attempt to understand and respond to the virus. Alongside these perspectives we also follow a blogger, Alan Krumwiede (Jude Law). The film's main villain (besides the virus itself), Krumwiede questions the motives of the government response and uses his online presence to promote Forsythia, a flowering plant used in traditional Chinese medicine, as an effective treatment. Within the conspiracy fantasy world, even with this virulent real virus sweeping the world, rumours of Chinese experimentation and monetisation of potential antidotes monopolise social media, as unscrupulous individuals look for some fruitful avenue for publicity.

The film utilises a hyperlink structure that cuts back and forth between the characters in the manner of movements through the internet, governed by what Lev Manovich calls nonlinear database logic (see *Smart Cinema*, Brereton 2012). The film shows us other victims of the virus who also encountered it in the casino and are now transmitting the disease as they travel to different parts of the world. A vaccine is finally

developed, following Dr. Ally Hextall's (Jennifer Ehle) decision to bypass research ethics norms, but not before millions have died. The film concludes by showing us Day 1—the spillover event. We see forests in China being cleared, forcing bats from their natural environment. One bat ends up near domesticated pigs, one of which eats fruit dropped by the bat, allowing the virus to jump species. The virus jumps species once again, when the chef who prepares the slaughtered pig in Macau shakes hands with Beth Emhoff who subsequently becomes infected.

Contagion is an ideal vehicle for us to contemplate the vices leading to and arising from a pandemic; and from the perspective of 2020's pandemic, it is uncannily prescient. Art constantly reimagines notions of virtue and vice, providing historical contextualisation of both virtue and vice. This is not to say that "film" enacts philosophical concepts in a pure way, but that films can provide narratives that allow the exploration of philosophical ideas, irrespective of whether this is not entirely intentional or not. As such, film provides a perfect vehicle for the exploration of vice. Central to a vice is that it harms others, and harms those also with the vice. Hubris harms those who possess it by preventing them from seeing themselves clearly, it can lead to an excessive self-regard, to an overestimation of one's capabilities, and an underestimation of their possible weaknesses and vulnerabilities. In terms of viewing others, hubris can cause the individual to undervalue others, to ignore or dismiss harm done to others (particularly if done by the hubristic person), and ultimately to ignore their status as moral equals. *Imprudence* means making decisions carelessly, lacking practical wisdom, and failing to deliberate wisely about practical matters. A lack of prudence even risks corrupting the other virtues (e.g., being brave to the point of recklessness or allowing temperance to slide into life-denying asceticism).

In *Contagion*, we see evocations of hubris demonstrated both individually and collectively. Krumwiede spends the movie promoting a bogus cure (*forsythia*) seemingly believing that he can spread falsehoods with impunity, even whilst endangering people's lives and public order (people attempting to obtain forsythia overwhelm pharmacies and riot). Krumwiede is characterised by greed—defined as "an excessive desire to acquire or possess more than what one needs or deserves, especially with respect to material wealth" (Cafaro 2005, 147)—and hubris in that he relishes his new found fame and influence. He is then a dramatic "antidote" to the rationality of science—he offers the quick fix, the easy solution that all of us want at some point. He is eventually arrested for fraud—undone by his own hubris, imprudence and greed.

The response to the current COVID-19 pandemic exhibits many of the same failings. These are most apparent in the US. The world's richest economy had at the time of writing, the highest number of deaths (567,000), the world's 14th highest deaths per capita. Political leadership in the US was initially noticeably lacking—ex-President Trump suggested that COVID-19 would disappear like a "miracle," suggested injecting bleach, promoted hydroxychloroquine (an anti-malarial drug) as a cure, implied that states imposing restrictions on movement needed to be liberated, and that the wearing of masks (designed to protect others) was worthy of contempt. Not only this, but the Republican Party hosted a garden party that turned out to be a super-spreader event, and the President himself contracted the disease. This perspective is not unique to the US, of course.

The position that COVID-19 should be allowed to spread as the economic costs are so high suggests a dominant cultural trait. Indeed, "herd immunity" (where enough

of the population becomes immune to a disease with the result that transmission of the disease fizzles out) has only ever been achieved using vaccination (Lawton 2020). Global politics are excessively focused on economic growth even when the consequences of unchecked growth are so ruinous. *Wall Street*'s (1987) Gordon Gekko's mantra of "Greed is Good" is now a truism. However, the economic arguments—at least where COVID-19 is concerned—are not as simple as they seem. Real suffering will result from economic decline, and not every instance of economic concern is an example of the vice of greed. Imprudent measures that alienate the public are likely to be ineffective. The resistance of Manchester in the UK to the imposition of a harsher lockdown than existed in other parts of the UK taps into already extant grievances about the unequal distribution of wealth in that country (Blake 2020). Those that are incapable of conceiving that they might be mistaken are more likely to act imprudently. Thus hubris can beget imprudence. Hubris is more blatant and less nuanced. Illustrations of hubris in relation to COVID-19 are numerous. Confronting a viral pandemic by denouncing experts such as Dr Antony Fauci, the director of the National Institute of Allergy and Infectious Diseases (NIAID), is an egregious example of a politician with no epidemiological experience presuming to ignore the warnings of an expert. Similarly, in Ireland, the government ignored advice from the National Public Health Emergency Team to enter the strictest level of lockdown in early October 2020 (Lehane 2020), only to see infections rise significantly and enter the strictest level a fortnight later (RTE 2020). Acts of hubris have, at the very least, exacerbated the impact of COVID-19.

The casual disregard for science displayed by, for instance, the US leadership is best characterised as a form of imprudence. Ex-President Trump's willingness to endanger others by going for a drive to wave to supporters outside the Walter Reed Hospital when still infectious lacks empathy and endangers those who were forced to accompany him. *Contagion's* depiction of the response of a vicious individual to a pandemic is, as it turns out, optimistic—Krumwiede, for all his flaws, is not ultimately in charge of a nation's response to a novel disease. Perhaps even more happily, he gets his comeuppance in the end.

Contagion also examines our collective response, illustrating how a severe outbreak will undermine the possibility of collective flourishing. *Contagion* portrays riots (as mentioned) and a general breakdown of law and order. Thus far, the real response to COVID-19 (a less lethal disease than that in the film) has (thankfully) not been marked by riots and a general break-down in law and order. Nonetheless, the movie does illustrate a collective vice that not only has contributed to the emergence of COVID-19 but also risks undermining our collective flourishing over the next century and beyond: namely humanity's imprudent disregard for the natural world. *Contagion* supports this view of human intrusion on nature as a primary cause of disease in its final scene, which shows a bulldozer working on a development project in China, felling a palm tree, disturbing an infected bat that contaminates a pig in a nearby farm and setting in motion the core elements which kick-started the virus. Once the pig is prepared in the Macau casino kitchen, the disease jumps to humans. With the international jet travel that subsequently spreads the virus, *Contagion* dramatises Jim Robbins' assertion that "emerging diseases have quadrupled in the last half century, largely because of increasing human encroachment into habitat" (Robbins 2012). We will return to this vice in the final section of the paper.

Virtues

To focus on vices, is, to some extent, to invert the focus of virtue theory, which aims to promote some desirable goal. The goal of characters and actions is to achieve this good—the *telos*. Institutions, practices and systems should also aim towards this telos. The good is variously conceived, depending on the theory. For Aristotle, it was *eudaimonia*, usually translated as "happiness" or "flourishing." Flourishing can be known and should be the goal of one's life. Clearly a pandemic, such as COVID-19, is not conducive to any concept of human flourishing (though this might benefit the rest of nature). Films focused on pandemics will also celebrate certain virtues, essential for flourishing. To illustrate this, we focus on *The Andromeda Strain*.

Directed by Robert Wise[1], *The Andromeda Strain* is based on a novel and screenplay by the prolific and often ecologically provocative author Michael Crichton, who went on to write *Jurassic Park* (1990). The story begins with an aerial view of the small remote village of Piedmont in New Mexico. An elite scientific and military team is gathered to investigate the mysterious deaths of everyone in Piedmont—bar a drunken old man and a crying baby—with everyone appearing dead from a mysterious "virus."[2] The team locate a satellite which has crashed to Earth carrying an alien microbe. They are brought to the remote "Wildfire" base in Nevada to research the microorganism. As the team becomes metaphorically and physically cleansed in preparation for an investigation of the virus within a secret underground research laboratory, the audience is treated to a technical display of scientific instrumentation and an evocative use of colour and architectural space within a carefully structured *mise-en-scène,* comparable to the clinical delights of Kubrick's *2001: A Space Odyssey* (1968). Surveying the survivors from within their protective life-suits, and examining the alien life force from behind glass screens and banks of monitors, audiences are forced to confront the unseen "horror." All the sophisticated technology mediating the alien's Otherness does not provide a language to decode its awesome strangeness. All the investigators are left with are humorous platitudes like "it's getting bigger," as they attempt to "test" the molecules with their (un)sophisticated instrumentation. Unlike life on this planet, which is implicitly understood and apparently fully appreciated, this alien life does not conform to (eco)logical patterns, particularly on leaving no waste of any type and surviving within apparently non-nurturing conditions. Like the Borg in the *Star Trek* franchise, its indescribable life force cannot be destroyed by "conventional force"—a fact which greatly upsets the logical, ordered, scientific minds of the investigators who can only comprehend organisms that conform to planetary ecological rules. This willingness to adapt ideas when presented with new information—even information

[1] He also directed the classic science fiction film *The Day the Earth Stood Still* (1951), which was one of the few films to treat the aliens as benevolent. The film had a strong pacifist message, which tried to get humanity to step back from the brink of nuclear destruction. This pacifist and ecologically framed cult film is dramatized by the alien's ability to stop all artificial power on the planet. The aliens try to teach humans that they must learn to respect "nature" and stop their "senseless wars," or face terrible consequences.

[2] (Post)modernism often uses the metaphor of viruses and disease to describe the state of anomie. Jameson and Baudrillard describe the postmodernist condition as "schizophrenic," requiring "no experience of temporal continuity" (Rushing *et al.* 1995, 17).

previously inconceivable—illustrates the humility at the heart of the scientific endeavour. Classic narrative demands are rewarded however, when the individualised, jumped-up medical doctor (considered the lowest risk and therefore given the awesome responsibility of controlling the ignition key to nuclear destruction) deduces that the fast breathing of the baby who survived the incident somehow serves the process of avoiding contamination. The microbe later mutates and escapes the contamination room, triggering the base's nuclear self-destruct mechanism. That the pathogen would multiply as a result of the nuclear blast and pose an existential threat to life on earth adds to the peril. The team manage to disable the device and the pathogen is exposed to clouds that will result in it coming into contact with sea water, rendering it harmless. Thus it is the inbuilt defence-mechanism of the Gaian earth system that serves to protect and save human life as opposed to the man-made, destructive power of nuclear fission. Like the human body's immune system, the earth's greater immune system is fully dramatized, allowing audiences the filmic space and time to deduce its ecological potency.

The Andromeda Strain can be read as a celebration of the virtues, specifically intellectual virtues, reified as scientific practice. It dramatises *phronesis* (practical wisdom or prudence). The film's narrative concerns efforts to prevent an unknown pathogen wreaking havoc with life on earth. The protagonists are scientists and military experts trained to respond to such dangers, and the setting is a specially designed lab set up to contain microbial threats. This is the opposite of recklessness. The film then extols the virtue of temperance. Our protagonists are sober-minded, serious people. They are sound of mind. The scientists are open-minded—they study the pathogen calmly and forensically. They are sincere—they (mainly) act in good faith towards each other and towards their project. They exemplify a fidelity to the truth as revealed by empirical discovery and scientific consensus, similar to the current exploration of COVID-19.

The scientists also possess *humility*. The conclusion of the movie critiques scientific hubris and orthodox thinking in the face of novel threats—the best safeguards humanity had conceived of (in the world of the film), had they not been halted, would have resulted in the destruction of life on earth. If, in the finale, the President had acted on the scientists' logical deductions to wipe out Piedmont (the pre-designed site of the accident) with a nuclear deterrent, the alien life force would have used this "negative" energy to increase and multiply, rather than being destroyed. Humility then can be read as an intellectual virtue—we are willing to accept that we might be wrong, that we do not know everything. Without humility, we would never be able to admit when we are wrong, when we need to change course—without humility we would be incapable of responding when the evidence tells us that we have thus far been mistaken and we need to adapt.

The scientific and military team are purified in preparation for an investigation of the virus within a secret underground research laboratory. *Purity* is a virtue often associated with the sacred; but in a scientific guise it is associated with cleanliness and hygiene. Instead of undergoing purification rituals in order to approach some sacred idol, now purity is used to protect us from malign biological material. This takes place in a scientifically "sacred" space, with complex rituals and instruments. Both visually and dramatically, this is a celebration of intellectual and scientific virtue.

This sort of purity is not feasible in the real-world. Nor would such a clinical purity be welcome, if we are being honest. But the virtues of fidelity (to the truth), open-mindedness, and sincerity or good faith will be central if we are to overcome the challenges posed by the COVID-19 pandemic. Those making policy decisions must act in good faith. If they want the populations to follow them, those in charge must be honest—they must truthfully tell people what they believe. Questions of the viability of a vaccine, the hardships restrictions might impose, and impact of specific measures designed to combat the spread of the virus all require information given sincerely. Scientists and policymakers must be open-minded and be willing to look at new evidence, lest something vital is missed. Collectively, we must all retain a fidelity to the truth. We must combat misinformation and act according to what is truly the case, not what we wish it to be. If we are to achieve any sort of solidarity in the face of COVID-19, if we are to avoid the conflicts with each other that hinder our attempts to confront the virus, these virtues are a prerequisite.

However, the ending, as mentioned above, is slightly more ambiguous: while it celebrates individual, rational decision-makers, it also suggests we need to be humble—that even our best safeguards might be insufficient—that in the face of unknown natural events, all our endeavours and foresight might still require luck, and will require the protection of the earth system.

Discussion

As with any other aspect of individual or social life, responses to a pandemic, whether it is COVID-19 or the fictional MEV-1 will benefit from virtuous actions and will be hindered by vicious actions. We have seen the chaos caused by vicious responses—be it hubris, recklessness, or self-indulgence. Such vicious actions, and others, have allowed the virus to spread, leading to over three million deaths at the time of writing.

Politically, Aristotelian theory suggests society should be structured in such a way as to promote the flourishing of individuals. However, virtue ethics can extend beyond human individuals. That human flourishing should be the end, or telos, towards which human society aims is just one version of virtue ethics, based on one's value system. For some environmental virtue ethicists (e.g. van Wensveen 1999; Cafaro 2015) all moral agents and living beings are valuable. In such theories, a virtue will be a character trait that is conducive to the flourishing of all living beings (Cafaro & Sandler 2011). This might even be extended to ecosystems or the biosphere as a whole. However, in virtue traditions, the individual is not conceptualised as an isolated individual, but as someone who is dependent on their community. This dual focus on the individual and the collective is a major reason why virtue ethics provides such an ideal framework for exploring the ethical and political issues arising from pandemics.

COVID-19, like the stories of both *Contagion* and *The Andromeda Strain*, reveals to us the precariousness of human civilization. The relationship of humanity to the rest of nature should be an overriding concern when discussing novel disease outbreaks—something both our filmic texts acknowledge. A healthy environment is vital for the flourishing of humanity. COVID-19 reminds us of this fact—and this uneasiness is a subtext of both *Contagion* and *The Andromeda Strain*.

COVID-19 is simply the latest in a number of novel disease outbreaks, that are thought to be increasing in frequency, and which result from human interference with

the natural world (Smith et al. 2014; IPBES 2020; WWF 2020). Both the United Nations and the World Health Organisation have argued that pandemics are the result of the destruction of nature (Carrington 2020). To assume that humanity can continue "business as usual" while our population expands, and we continue to degrade the environment—as we stand at the threshold of a climate (or even a temporal earth system) humanity has never experienced—is to commit an act of great hubris. If we view COVID-19 and other mass-disease outbreaks experienced by humanity in the last number of decades from an environmental perspective, they begin to look much like "punishment" for our hubris in regard to nature. The alternative theory—that the virus was modified in a laboratory and then escaped—is also an example of hubris, though of a more common variety (and nor would it undermine the more general point about human hubris in relation to nature).

The prudential course of action then would be to change our destructive behaviour towards the rest of nature. The fissure caused by COVID-19 in our *modus vivendi* represents a chance to change course. There is an opportunity to rebuild our economies, ensuring that they are less environmentally destructive, as demonstrated by the EU's interest in a "Green Deal" (European Commission 2019). Indeed, it has been suggested that GDP should no longer be the focus of post-COVID economics (Bailey et al. 2020). Given that COVID-19 has been described as an "SOS signal for the human enterprise" by the UN's environment chief (Dasgupta & Andersen 2020), the prudent thing to do would be to change course. To do otherwise would be imprudent.

Changing course like this would, however, require us to act with humility. To accept that, despite technological progress and great wealth for so many individuals, our collective way of life is destructive, to ourselves and to the environment on which we are reliant, requires humility. We do not mean individual humility but a collective humility. Acting for a collective good is one of the greatest challenges of responding to a pandemic, and to the many environmental crises we face. Western moral and political frameworks have been built on theoretical foundations that prioritise the rational individual, rather than any collective. Our practices thus prioritise each individual pursuing their own conception of the good. This can result in practices that produce collective harms, such as environmental breakdown and increased risk of pandemics.

The practices that contemporary human society has developed are leading to what is being called the 6th Mass Extinction event. We destroy habitats and wipe out species, and call it progress. To give two examples: it has recently been revealed that 40% of the world's plants are at risk of extinction (Antonelli et al. 2020); whales are at risk of extinction (Briggs 2020). Unfortunately, countless more examples can be provided. These are not only tragedies in themselves, but they are part of a trend—humans driving life on earth to extinction—that threatens us (Dasgupta & Andersen) and is likely to result in more pandemics (WWF 2020). Just as the human immune system is struggling to adapt to COVID-19, the Gaian system (the saviour in *The Andromeda Strain*) is struggling with human proliferation.

These crises are made all the more challenging in that they are collective action problems, with climate change being characterised as the "paradigmatic longitudinal collective action environmental problem" (Sandler 2009, 168), and require collective solutions. Collective action problems arise as a result of individual interests conflicting with the best interests of the group. Environmental collective problems "arise from the cumulative unintended (and often unforeseen or unforeseeable) effects of a vast

amount of seemingly insignificant decisions and actions by individuals who are unknown to each other and distant from each other (spatially, temporally, and socially)" (Sandler, 168). Such problems can in turn result in a "problem of inconsequentialism" whereby people's individual contributions to fixing the problem appear to be so insignificant (and sometimes impose costs) that people lose any incentive to take such actions (Sandler 2009; Knights 2019).

Virtue ethicists have argued that virtue-oriented ethical approaches are better able to respond to the problem of inconsequentialism (Sandler 2009; Knights 2019). Virtue theories are perhaps better able to confront these dilemmas as "virtue-oriented ethical theory has the resources to justify modifying one's behavior in response to longitudinal collective action problems even if others are not likely to do so, which is crucial if one is to set an example or lead others to change" (Sandler 2009, 178).

Virtue ethics is particularly adept at providing a means of escaping the dichotomy of the individually rational and the collectively rational by focusing on the way in which the individual person is dependent on others (Hourdequin 2010, 457). For instance, Alasdair MacIntyre argues that our flourishing as autonomous adults requires us to understand and acknowledge that we have been dependent on others (individuals and social networks), and that our flourishing as independent reasoners requires us to acknowledge this (MacIntyre 1999). This requires us to practice the virtues of acknowledged dependence—virtues connected with justice and generosity, with receiving with good grace and giving without expectation of immediate reward. The practice of these virtues, McIntyre argues, will help us flourish as individuals and help us understand that we are not always self-sufficient, and in doing this, will help us understand our role as members of a larger community, a network that supports us through giving and receiving (MacIntyre 1999). MacIntyre's insights can be applied to humanity's interactions with the rest of the natural world (Hannis 2015). Building on MacIntyre's virtues of acknowledged dependence, the virtues of acknowledged ecological dependence begin with the fact that both humans and non-human animals "are all vulnerable physical creatures who flourish only in particular physical conditions" (Hannis 2015, 151).

Science Fiction narratives, such as *Contagion* and *The Andromeda Strain* are here extremely significant. Our lives then make sense only in the context of larger life stories, the stories of our civilisation and our species, and ultimately life on earth. Storytelling is a universal human practice, integral to the creation and sustaining of our social and political collectives.

Our two filmic texts dramatise our ecological dependence and celebrate the relatively small acts of individuals that contribute to the overcoming of the fictional threats. They remind us that humanity's position of dominance might not be permanent. However, our social and moral life is dominated by anthropocentric ideals, in which only humans have intrinsic value (and which presuppose the ontological centrality of humanity on earth) and by faith in the power of science, technology and the inevitability of progress. In this sense, our larger narrative might be corrupted by the vice of hubris. Contemporary society owes much to the Enlightenment—with its disdain for magical thinking, its faith in science and technological progress, and its exaltation of the rational individual. Western societies, benefitting from technological development, abide by social contracts between citizens. Science and trade have seen wealth and health increase in most developed nations. This is a story of progress, seemingly without end.

COVID-19 forces us to question the narrative of ceaseless progress. As well as being *exacerbated* by human hubris, the disease outbreak might also have its origin in human hubris. There are myriad examples of hubris in human relations, but the relationship of humanity with the natural world is almost wholly characterised by hubris. Within modern political theories and mainstream moral theories, the natural world is accorded no moral status and at best only instrumental value. Indeed, the concept of the Anthropocene—a human-dominated geological epoch (Lewis & Maslin 2015)—has been criticised as celebrating human dominion over the natural environment (Crist 2013).

Cinematic stories about pandemics or the threats posed by new pathogens allow us to explore the solidity of our technologically-advanced societies. The threats they dramatise reveal our vulnerability, and the solutions they suggest—being responsive to the facts, collective (scientific) cooperation—are useful exemplars. However, both films might be guilty of a secondary type of hubris. Both films illustrate the threat posed by the monstrous flourishing of a novel pathogen, revealing the precarity of human civilisation. Both show how collective endeavour and rational practice is required to discover the solution to this threat. However, as we have seen from COVID-19, the scientific solution is merely the first step. With COVID-19, the scientific community has been thus extremely successful in creating vaccines that promise (at the time of writing) to end the crisis. However, the distribution of the vaccine has resulted in rows and conflicts—notably between the European Union and the United Kingdom, as each tries to claim as many vaccines as possible. As ever, the wealthier nations have taken the lion's share of the vaccines, with the poorer nations left with inadequate supplies. According to research carried out by Duke University, "just four nations or regions with less than half the world's population have administered seventy percent of all COVID-19 vaccine doses, while the poorest countries have barely begun vaccinating due to lack of funding and supply" (McClellan et al. 2021). To this, we can also add the resistance of significant amounts of the population to vaccination. Our filmic texts present scientific success as the climactic success, but in the real world, scientific success does not herald a meaningful pursuit of collective flourishing.

In this sense the films are very much Enlightenment texts, in that they share the Enlightenment's sense of optimism that reason and technological development can save humanity. It is becoming more apparent however, that scientists and technology may well be necessary but are not sufficient. This would not surprise ancient Greek thinkers, such as Aristotle. The practice of virtue should not be confined to scientific spheres, it will be needed in the political realm too. Our films are perhaps guilty of being too Hollywood in neglecting this.

Nonetheless, virtues such as the ones outlined can serve as a guide to individuals and policy-makers. *The Andromeda Strain* illustrates some of the virtues that we require if we are to avoid catastrophe as a result of newly emergent pathogens.

Conclusion

It is in this space that eco-films are so effective and so unsettling. By presenting a vision of a flourishing inimical to human flourishing—the flourishing of a virus or of an alien pathogen—both films illustrate how human civilisation can be threatened by a monstrous flourishing. This then is an inhuman flourishing, whereby the flourishing of some other part of nature—terrestrial or alien—comes at the expense of humanity. Our

narratives about this perhaps suggest a collective unease with the downside of human flourishing, that it comes at the expense of the rest of life of earth. Ecological vice inverts the idea of human scientific achievement leading to progress and underscores the hubris inherent in the idea of the conquest of nature. That our collective vice results in a monstrous flourishing is a frightening inversion of our Enlightenment beliefs regarding human progress via scientific achievement. This frightening reflection as dramatically shown to audiences means pandemic stories such as *Contagion* and *The Andromeda Strain* serve to haunt audiences, despite ostensibly optimistic denouements.

The thrill of pandemic films lies in their ability to dramatise the tensions of scientific discovery, illustrating the risks we face from a dangerous world and from our own poor decisions, while providing us with catharsis (Aristotle 2013), a purging of the fears raised by scientific revelations about the risks we face both as individuals and as a society. As Aristotle knew, catharsis—by giving people an opportunity to purge negative emotions and thereby purify themselves—performs an essential public role. Indeed, narrative plays a central part in embodying virtue ethics. Virtue ethics has a fundamentally teleological aspect which requires us to give serious thought to what constitutes flourishing and how we will achieve this. Narratives, including our pandemic films play a central part of this and provide a coherent framework to our understanding of our telos. Cinema is one of our most effective ways of creating our collective narratives—suggesting to us that our place in the world is not so secure as we would like to suppose. Indeed, narratives of pandemics can in some way be seen as providing a counter-narrative to our Enlightenment myth of the triumph of humanity.

An advantage narratives have in relation to analytic philosophy (aside from accessibility) is that they can be ambiguous in a way analytic philosophy cannot be. Here they are most telling. Whilst they celebrate the virtues of heroic individuals and humanity's collective scientific and technological achievements, they reveal anxieties about the effect of these achievements. They dramatise the unwelcome truths that science has revealed to us and that the Enlightenment narratives about rational man and endless progress avoid—that our place on Earth is contingent, that we are vulnerable. Our own success might contain the seeds of our downfall, or "Nature" might present us with something which will wipe us out. In these ways, the films discussed dovetail nicely with issues of climate change, just as COVID-19 can be "read" as a warning from nature.

Pandemics, such as COVID-19, upend classic Hollywood narratives with their linear trajectory and necessity for individual heroes and clear resolution. We have seen whole societies go into lock down—with almost all normal aspects of social and political life coming to a standstill. This pandemic reveals the fragility of our societies—while movies such as *Contagion* suggest to us that the social contract governing society is itself fragile. Viruses precede humanity and so have been with us throughout our history, but our awareness of them is extremely recent—they were discovered by scientists in the 1890s. They exemplify a darker side of the Enlightenment quest for knowledge—the discovery of something potentially terrible. Knowledge itself becomes terrifying. Yet we must retain a fidelity to the truth—deluding ourselves, allowing ourselves to fall to nicely-presented fake solutions will only entrench our difficulties. This is particularly germane now that it is apparent that our current practices, which due to technological developments now have a global impact, are not virtuous from an

environmental perspective (a perspective that is truly informed by science) and undermine the conditions necessary for our flourishing.

Being shown the limitations of our technological society is deeply unsettling. Hovering at the edge of our collective consciousness when considering COVID-19 is the idea that it reveals the truth about our position in nature. We are one species amongst millions of others, and just as vulnerable. We are not as in control of nature as we like to tell ourselves; progress is not inevitable; our world and continued existence in it is fragile. In this sense, pandemics suggest the sublime: "Whatever is fitted in any sort to excite the ideas of pain, and danger, that is to say, whatever is in any sort terrible, or is conversant about terrible objects, or operates in a manner analogous to terror, is a source of the *sublime*; that is, it is productive of the strongest emotion which the mind is capable of feeling. . ." (Burke 1757/2015). The pandemic suggests that we are encountering the environmental sublime.

Flourishing, as the ancients told us, will only be achieved if we live virtuously. This drama has been played out in science fiction films numerous times and is all the more apparent in the age of COVID-19. Practical wisdom, temperance and humility together will mean that humanity can work with its environment to save itself from novel and deadly threats.

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