

Bangor University

DOCTOR OF PHILOSOPHY

Script development and interdisciplinary collaborations in the production of climate-fiction films

Cortese, Michela

Award date:
2021

Awarding institution:
Bangor University

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

**SCRIPT DEVELOPMENT AND INTERDISCIPLINARY
COLLABORATIONS IN THE PRODUCTION OF CLIMATE-FICTION
FILMS**

Michela Cortese

Thesis submitted in fulfilment of the requirements for the degree of **DOCTOR OF
PHILOSOPHY** awarded by Bangor University

June 2021

School of Languages, Literature and Linguistics

Bangor University

'Yr wyf drwy hyn yn datgan mai canlyniad fy ymchwil fy hun yw'r thesis hwn, ac eithrio lle nodir yn wahanol. Caiff ffynonellau eraill eu cydnabod gan droednodiadau yn rhoi cyfeiriadau eglur. Nid yw sylwedd y gwaith hwn wedi cael ei dderbyn o'r blaen ar gyfer unrhyw radd, ac nid yw'n cael ei gyflwyno ar yr un pryd mewn ymgeisiaeth am unrhyw radd oni bai ei fod, fel y cytunwyd gan y Brifysgol, am gymwysterau deuol cymeradwy.'

Rwy'n cadarnhau fy mod yn cyflwyno'r gwaith gyda chytundeb fy Ngrichwyliwr (Goruchwylwyr)'

'I hereby declare that this thesis is the results of my own investigations, except where otherwise stated. All other sources are acknowledged by bibliographic references. This work has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree unless, as agreed by the University, for approved dual awards.'

I confirm that I am submitting the work with the agreement of my Supervisor(s)'

TABLE OF CONTENTS

Acknowledgements.....	vi
Abstract.....	vii
CHAPTER 1: Introduction.....	1
Introduction.....	1
The rationale behind the research.....	3
Screen production research as a methodology.....	6
<i>Case study and interviews</i>	8
<i>Reflexivity</i>	10
Chapters breakdown.....	11
CHAPTER 2: Literature Review.....	17
Introduction.....	17
Screenwriting and script development.....	18
The production of science-fiction films.....	21
Authenticity in science fiction and climate fiction film productions.....	23
Audience's reception and responses to climate fiction films	26
Visual representations of climate change in the media	30
Climate fiction films and speculative scenarios.....	35
Conclusion.....	43
CHAPTER 3: Making the Hollywood Cli-fi: the collaboration between scientist, screenwriter and director in the development of <i>Interstellar</i>.....	46
Introduction.....	47
Embedding the science in early-stage development.....	50
Negotiating science in pre-production and production stages.....	58
Visualising science in post-production.....	62
Conclusion.....	71

CHAPTER 4: Producing the Cli-Fi Short Film: the academic collaboration in the development of <i>Be Tradition</i>	75
Introduction	75
The interdisciplinary collaboration in early-stage development	76
Negotiating and writing the science in pre-production stages	81
Embedding the science in production and post production stages	88
Conclusion	94
 CHAPTER 5: Writing the Environmental Thriller: the interdisciplinary approach in the script development of <i>The Dead Cry Out</i>	 98
Introduction	98
Embedding the environmental disaster in early-stage script development	100
<i>Synopsis</i>	102
Developing the environmental disaster and the characters of the fictional island	109
Conclusion	122
 CHAPTER 6: Conclusions	 126
Critical reflections on the findings from the analytical chapters	126
How do screenwriters/filmmakers and scientists approach the writing of scientific concepts during the collaborative script development of cli-fi films?	132
How does the embedding of scientific concepts in the story affect the script development process?	136
Reflections on the methodology and final remarks	141
 Bibliography	 145
Filmography	154
 Appendix	 156
Appendix A: Interview with Prof. Kip Thorne	157
Appendix B: Interview with Dr Enrico Andreoli	167

Appendix C: Interview with Dr John Finnegan.....	178
Appendix D: Interview with Oisín Mac Coille.....	189
Appendix E: <i>The Dead Cry Out</i> : Screenplay.....	195
Appendix F: <i>Be Tradition</i> : Shooting Script.....	196
Appendix G: <i>The Dead Cry Out</i> : Pitch Bible.....	197
Appendix H: Signed Consent Forms.....	198

Acknowledgements

The realisation of this thesis would have not been possible without the support of my supervisor, Professor Vian Bakir. I first thank her for encouraging me to embark on a new journey as a PhD student at Bangor University, where I completed my undergraduate degree in her department in 2013. Professor Bakir's immense knowledge and professionalism have been a source of inspiration while I grew as an academic and I cannot thank her enough for helping me through various obstacles.

I would also like to express my gratitude to Dr Eben Muse for believing in my skills and allowing me to start my career as a lecturer at Bangor University. My gratitude also goes to my tutor and friend Dr Steffan Thomas, who would always listen to my issues and provide solutions in moments when I believed it would have not been possible for me to continue my doctoral studies.

As the reader will see, this research was also the result of different collaborations with scientists and filmmakers who very kindly accepted to be part my study. First, my sincere appreciation goes to Dr Enrico Andreoli, a unique engineer whose vision and appreciation for the arts, along with extreme patience in working with me, allowed me to produce my first environmental short film. A special note of gratitude for his help with my study also goes to Professor Kip Thorne, whose seminal work in the field of astrophysics and his role in the creation of the film *Interstellar* (2014) has inspired my research in climate change fictional films. I would also thank the director Oisín Mac Coille, who provided me with great advice while developing my screenplay as part of the thesis and with whom I have now embarked on other projects.

To my mother, my father and my sister: I would never be where I am without your enormous support through the most difficult moments. The achievement of this work could have not happened without you.

And last, I want to express my love and gratitude to John Finnegan, my best friend, husband and partner in my adventure in the world of screenwriting and filmmaking. You have been next to me since we met as colleagues and supported me in every single step I took on this path. Thank you for giving me strength and for encouraging me to never give up while I was going through the hardest moments of my life: I dedicate this thesis to you.

Abstract

Through the application of practice-led research, case study and interviews, this doctoral thesis presents an interdisciplinary study of the collaborative script development of fictional films that portray environmental issues linked to climate change. The main objective of this study is to contribute to the existing literature in script development by focusing on the interdisciplinary collaboration between the screenwriter/filmmaker and the science expert during the production of climate-fiction films. This research also generates new knowledge that can inform researchers in science and climate change communication who are interested in the production of climate fiction for the screen. In this study, I engaged as a screenwriter, filmmaker and producer while collaborating with other practitioners and science experts in academic and film industry contexts, in order to examine how the personal agendas, ontological and epistemological beliefs of the different parties can influence the script development process. Besides reflecting on my practice of the script development for a cli-fi film, I also analyse the experience of my collaborators as we embraced the challenge of embedding the topic of climate change and the related science into a fictional narrative. The analyses of *Interstellar* (Nolan, 2014), an acclaimed Hollywood production; *Be Tradition* (Cortese, 2017), a short film on renewable energy; and *The Dead Cry Out* (Cortese and Finnegan, 2018), a screenplay for an environmental thriller, are an opportunity to analyse the ways in which screenwriters/filmmakers and science experts approach the writing of scientific concepts during the collaborative script development of cli-fi films. Moreover, this study provides an analysis of how the embedding of such scientific concepts in the story affect the script development process of the climate-fiction film.

CHAPTER 1

Introduction

Introduction

This doctoral thesis presents practice-led research in the collaborative script development of fictional films that portray environmental issues linked to climate change. The main objective of this study is to contribute to the existing literature in script development by focusing on the interdisciplinary collaboration between the screenwriter/filmmaker and the science expert during the production of climate-fiction films. This research also aims to generate new knowledge that can inform researchers in science and climate change communication who are interested in the production of climate fiction for the screen. In this study, I engaged as a screenwriter, filmmaker and producer while collaborating with other practitioners and science experts in academic and film industry contexts, in order to examine how the personal agendas, ontological and epistemological beliefs of the different parties can influence the script development process. Besides reflecting on my practice of the script development for a cli-fi film, I also analyse the experience of my collaborators as we embraced the challenge of embedding the topic of climate change and the related science into a fictional narrative. Following this line of research, this study also led me to observe how screenwriters/filmmakers and scientists negotiate their perceptions of *authenticity* during the script development process.

Due to the increasing amount of collaboration between filmmakers and scientists in industry and academic contexts (Kirby, 2013; 2014) and the fast-mutating nature of filmmaking approaches (Maras, 2009), this study is an opportunity to update and expand the discourse on interdisciplinary collaborations in the production of climate fiction films. As stated by Kirby (2014), there are still questions to be answered in regard to the collaboration between the screenwriter/filmmaker and the scientist in pre-production stages, the role that science plays in the scriptwriting process, and how the screenwriter approaches the specific science. Nonetheless, it is important to highlight that compared to Kirby's seminal work on the role of the scientist as consultant in sci-fi Hollywood productions (Kirby, 2013), my study considers the scientist as an integral part of the script development process that, as this study shows, is not confined to a pre-production stage. As Maras (2009) noted, the traditional division of the production process into three stages (pre-production, shooting, and post-

production) can make it difficult for the screenwriter practitioner/researcher to position their work since “not all forms of production rely on a single moment of conceptualisation or scripting, and scripting can happen across the entire process of production” (Maras, 2009: 22). Indeed, similarly to what has been discussed by Taylor and Batty (2016), one of the challenges that I faced through this study was to identify where the script development stage, and the specific embedding of the science, began and ended in my research contexts.

The three sites of investigation in this thesis are the script development of: 1) *Interstellar* (Nolan, 2014), a Hollywood climate-fiction film; 2) *Be Tradition* (Cortese, 2017), an academic short film on renewable energy; and 3) *The Dead Cry Out* (Cortese and Finnegan 2019), a feature-length screenplay for an environmental thriller. Informed by the existing literature on the role of scientists as consultants in film productions (Kirby, 2003; 2013; 2014), and screenwriting research in script development (Batty et al., 2017; 2018), this study examines the screenwriter/filmmaker’s and the scientist’s approaches to the writing and the inclusion of scientific concepts related to climate change in the fictional narrative. For each case, the analysis starts with an observation of the process from an early stage of the development, where the creators begin to shape the screen idea, to a later stage where the script advances from a first draft to a stage of production and post-production. For this investigation, I adopted *screen production research* as a practice-led methodology and research framework, and the creative outputs presented as part of this study are evidence of the generation of new knowledge through their embodying of the results. In this framework, I used *screenwriting*, *filmmaking*, *interviews* and *reflexivity* as research methods. Despite the prevalence of a practice-led approach, I applied a *case study* method for the analysis of the cli-fi *Interstellar*, presented in Chapter 3, in order to generate new knowledge that could inform my practice and allow a triangulation of the findings that stemmed from the different analyses. The development processes related to my practice are analysed in detail in the exegeses in Chapters 4 and 5, which explore the making of short cli-fi *Be Tradition* and writing of environmental thriller *The Dead Cry Out*.

Based on the premise and goals of this research, my investigation sets to answer the following research questions:

- 1) How do screenwriters/filmmakers and scientists approach the writing of scientific concepts during the collaborative script development of cli-fi films?
- 2) How does the embedding of such scientific concepts in the story affect the script development process?

Besides the practice, to answer these questions, this interdisciplinary study drew on existing academic literature from screenwriting research, film studies, science communication, environmental and climate change communication in order to support the various analyses.

The rationale behind the research

My study stems from both an interest in script development processes and the communication of climate change through the film medium. Whilst a small set of research has been published in both research areas, further research that combines these two fields is needed in order to investigate the collaborative and interdisciplinary nature of certain cli-fi film productions and examine how both the screenwriter/filmmaker and the scientist approach the writing of scientific concepts related to climate change. The results of such analyses can be beneficial for a further understanding of screenwriting processes, but at the same time this can also help those involved in creating and producing screenworks for the communication of climate change. As the number of fictional films embedding the topic of climate change has significantly increased in recent years (Svoboda, 2019), so should be the study of the production dynamics of such films. Even though the impact of these climate films could not be measured through an analysis of the production, the collaboration between the scientist and the screenwriter/filmmaker will have an inevitable impact on the narrative, which in turn will affect the public understanding of the science depicted in the film (Kirby, 2003).

Our understanding of nature and the world around us is shaped by the way we entertain ourselves and so are our actions towards the environment (Cox, 2013; McGreavy and Lindenfeld, 2014). Considering climate and science fiction films in particular, the cinematic naturalization of science in these productions can have an important influence over audiences' perceptions of the natural world as the science seem to be legitimized by these scientific depictions (Kirby, 2013: 228). As the viewers engage in the fictional narrative, they are also less motivated to counter-argue the events and the information presented to them through the story (Green & Brock, 2000), and it is no coincidence that academic studies on the audience's perception of cli-fi films such as *The Day After Tomorrow* (2004) concluded that the film had a significant role in shaping people's awareness of the risks posed climate change (Lowe et al., 2006). Climate-fiction films may not radically change people's behaviour towards this issue, but these narratives are nonetheless a starting point to engage the audience with the problem (Downs, 2014).

In a paper from 2003, Kirby claimed that the study of scientific content in entertainment media to date was primarily based on textual analyses and offer little insight into the production of the texts (Kirby, 2003: 263). Moreover, in the same paper, Kirby argued that scholars should look at the specific media form, such as the sci-fi film, rather than referring to the mass media in general. Whilst in the past two decades the fields of science and climate change communication have provided a large number of studies of the specific media form (e.g. TV news, advertising campaigns, and documentaries), the review of the literature undertaken as part of this research has disclosed that a lack of studies on cli-fi film productions, especially at the scriptwriting stages, continues today. It is important to note that, like any other film, when a cli-fi goes into production in the film industry this is registered as a company and, as such, this becomes a new outlet through which messages related to climate change are constructed and disseminated. Moreover, films such as *The Day After Tomorrow* (2004) have allowed for the production/imitation of similar films in the following years and these replicas represent an escalation and intensification of the first film while presenting a permutation of the same message (Svoboda, 2016). For example, we can observe a case of escalation in *Interstellar*. While in previous cli-fi films people would experience an environmental disaster but still remained on their land, in *Interstellar* the scientists (and the entire population to follow) must leave planet Earth to find a new place where the human species can survive. Due to the evolving nature of these productions and their potential role in spreading important messages about climate change, it is important that the script development and production processes of these film narratives are taken into consideration and remain under scrutiny in academic contexts.

Examples of the link between climate change communication and fictional films can be found in several contexts. Environmentalist associations such as Sir David Attenborough's CoolEarth.org, Matt Damon's Water.org or The Leonardo DiCaprio Foundation represents important examples of filmmakers, actors and producers involved in the fight against climate change. Even when the narrative of the film does not explicitly mention the phrase *climate change*, producers and the audience still find a connection with this global issue. For instance, the Hollywood celebrity Leonardo DiCaprio, who has acted as climate change ambassador for several years, included the climate crisis in his Oscar acceptance speech for 'Best Performance by an Actor in a Leading Role' in *The Revenant* (Iñárritu, 2015) during the Academy Awards 2016. His speech was an opportunity to remind the public of the significant impact that climate change is having on every single aspect of our society, including the film industry:

Making *The Revenant* was about man's relationship to the natural world. A world collectively felt in 2015 as the hottest year in recorded history. Our production needed to move to the southern tip of this planet just to be able to find snow. Climate change is real, it is happening right now. It is the most urgent threat facing our entire species, and we need to work collectively together to stop procrastinating. We need to support leaders around the world who do not speak for the big polluters, but who speak for all of humanity, for the indigenous people of the world, for the billions and billions of underprivileged people out there who would be most affected by this. For our children's children and for those people out there whose voices have been drowned out by the politics of greed. (DiCaprio, Academy Awards, 2016)

This is only one example among many other initiatives that demonstrate the strong link between climate change communication and the film industry. With scientific institutions and governments united in trying to limit Global Warming to 1.5 degrees Celsius (IPCC report, 2019), those communities that have been engaged in the climate-change challenge have all been relying on messages coming from the media in order to raise awareness and encourage the lay-public to take part in this battle to save the Earth, and this includes the use of fiction. Communication scholars have argued that “most world citizens will not learn about climate change research directly from the cautious lexicon in scientific journals [...] but rather from the mass media” (Wilson, 2000: 201). However, the media, and fictional films in particular, may not necessarily report the risks associated with climate change in specific terms and producers and distributors will rather pick the eye-catching, dramatic and entertaining narratives that can capture the audience's attention (Wilson, 2000; Kirby, 2013). An analysis of the script development process allows the researcher-practitioner to closely observe the creation/construction of these stories and their messages.

Nonetheless, to define script development remains a challenge for screenwriting researchers since this process can mean “different things to different people, under different circumstances, at different times, for different agendas” (Batty et al., 2018: 154). Most traditional research in screenwriting has predominantly concentrated on the ‘end product’ rather than the practice of writing (Baily, 2019: 149) and while the industry has always been aware of the importance of script development as the foundation of screen production, “these processes are yet to be properly scrutinised” (Batty et al., 2018: 165). While screenwriting studies propose different descriptions of script development, “what all these definitions have in common is the element of *collaboration*” (Batty et al., 2017: 227), an aspect that will be further explored in the literature review. Nevertheless, more research is needed to understand how script development is experienced as a collaborative practice and the challenges that these

collaborations involve (Kerrigan and Batty 2016). With screenwriting research offering a framework for the analysis of interdisciplinary-collaborative writing processes, drawing on different fields such as media and cultural studies (Batty et al., 2018: 165), my investigation brings together script development and visual climate change communication in order to generate new knowledge that can benefit both research areas.

Screen production research as a methodology

With the support of a review of the literature in screenwriting research, film studies, science communication and climate change communication, this research uses *screen production research* as a framework and *practice-led research* as a methodology in order to:

- a) Analyse how the screenwriter/filmmaker and the scientist approach the writing of scientific concepts related to climate change in a fictional narrative;
- b) Observe how the embedding of such scientific concepts can affect the script development process.

Screen production research is the investigation of the development of audio-visual material that is intended for the screen (Batty and Kerrigan, 2018). As a framework, screen production research stems from the collaboration between the film/television/media industry and the academy, and the term was first coined through Australian scholarship. In the United Kingdom, scholars are more likely to refer to this kind of research as *screen* or *media practice*, although collaborations between the British and Australian academic institutions have allowed for the term to be increasingly used in European circles. Batty and Kerrigan's 2018 book *Screen Productions Research: Creative Practice as a Mode of Enquiry*, provides useful guidelines for researchers in the media, film and television studies who may be struggling to define their methodology and conceptually outline their work in screen production in a rigorous and consistent way. The screen production researcher may have a professional career in film and television or may come from other research fields such as media and communication studies, social sciences, and cultural studies (Kerrigan, 2018: 11). In their book, Batty and Kerrigan highlight that the study of the practice has expanded with the contribution of outlets such as the *Journal of Media Practice*; the UK *Media, Communication and Cultural Studies Association* (MeCCSA); the *Australian Screen Production Education and Research*

Association (ASPERA), and the *International Association for Media and Communication Research* (IAMCR).

Screen production research is an *interdisciplinary* field that finds its origin in the creative practice approach to research, although Batty and Kerrigan (2018) remark that unlike other disciplines in creative practice research, screen production research has been slower to start. When the practitioner/researcher uses creative practice as a methodology “the creative work is either the result of research (research-led practice/practice-based research), or it is used as a site for systematically gathering reflections on the process of doing/making, in order to contribute knowledge to the practice of doing/making (practice-led research/practice-as-research)” (Batty and Kerrigan, 2018: 7). To differentiate the procedures concerning screen production from the broader concept of ‘creative practice’, Kerrigan (2018) use the term *screen production enquiry* to describe a ‘new methodology’ that involves the development of a screen work through “an iterative process of practice and reflection by a researcher [...] and a theoretical perspective that informs the overall research” (Kerrigan et al., 2015: 13). Researchers of screen productions who apply either a research-led or a practice-led approach may already be experts of the creative/development process at a professional level, or they may be seeking to develop or advance their skills in a specific aspect of the practice. What these studies have in common is that the investigation carried out always happens from an insider’s perspective, i.e. the researcher observes their own actions while making a screen work. In the case of my research, I started my investigation with a basic knowledge of screenwriting and filmmaking with the goal of improving my knowledge of the craft and integrating it with my other research interest, i.e. audio-visual strategies for the communication of environmental risks through the film medium.

While creative practice research may see the application of a wide range of methods that span from art studio-based work to novel writing, studies in screen production research rely primarily on *screenwriting*, *filmmaking* and *digital media production* as their methods for the investigation (Batty and Kerrigan, 2018). For my research, I use *screenwriting*, *filmmaking*, *case study*, *interviews* and *reflexivity* as the key research methods. The next sections will illustrate the application of the case study, interviews and reflexivity as research methods; a more thorough analysis of filmmaking and screenwriting concepts can be found in the literature review chapter since they served not only as methods but also as supporting theory for my analyses.

Case study and interviews

The creative practice approach in screen production research emphasises the researcher's subjective position, where specific personal insights are unique to the individual's research process. Nonetheless, the practitioner/researcher in screen production may also rely on methodologies such as *case study* and *ethnography* to analyse the work of other practitioners. The application of such methodologies can facilitate screen production research that is designed around social enquiry by providing opportunities for further exploration, description, understanding, explanation, and evaluation of the subject under scrutiny (Kerrigan, 2018: 15). For my research I used *case study* as a method to explore the collaborative script development process in the production of *Interstellar* (2014) in order to: a) contribute to the existing research in the field, and b) use the findings from this unique case to help with the development of the outputs and the analysis of my practice. The term *case study* indicates research that investigates a few cases, often just one but in considerable depth. While in some instances the researcher creates the case(s) under investigation, in other cases, such as mine, the study comes out of an occurring situation in an already existing scenario (Gomm et al., 2009). Thus, the application of this method allows capturing the uniqueness of the case, rather than using it for theoretical interference of some kind that will lead to generalisations.

Case study often implies the collection of unstructured data and a narrative approach for the discussion of this data, rather than organising the data in terms of variable analysis (Gomm et al., 2009). As my research focuses on the personal experience of the practitioner, the preferred type of data collection for my case study was an open-ended interview with Professor Kip Thorne about his experience in the writing, production and editing of *Interstellar* (2014) and the collection of quotes from his book *The Science of Interstellar* (2014). While the book discloses pivotal information regarding the production, most of it is dedicated to the astrophysical science that led Thorne to win the Nobel Prize and that inspired this film. An interview with Thorne was necessary to allow a conversation on the making of *Interstellar* as a cli-fi film and in particular on the writing of Act 1, which introduces the environmental disaster. A transcript of the one-hour interview, including my questions, can be found in appendix A. Due to the difficulties with securing an interview with screenwriters Jonathan and Christopher Nolan, I gathered quotes from existing articles where the brothers discussed their experience and view on the making of the film. Nonetheless, Thorne's direct testimony proved particularly helpful for depicting a picture of the collaborative script development process in this production.

A recurring criticism of *case study* research is that its findings are not generalisable if compared to survey research for example. One response to this criticism is that, on the other hand, “the case study facilitates learning on the part of those who use them; and that this will involve ‘naturalistic generalizations’” (Gomm et al., 2009: 98), i.e. generalisations that develop within a person as a product of experience (Gomm et al., 2009: 21) - as opposed to empirical generalizations deriving from science. Nonetheless, according to Gomm et al. (2009) much case study research has the potential to put forward empirical generalisations, and that this is unavoidable. According to the authors, one important argument is that “the case investigated is a microcosm of some larger system or of a whole society: that what is found there is in some sense symptomatic of what is going on more generally” (Gomm et al., 2009: 99). From this perspective, both my analyses of the development of *Be Tradition* and the *Dead Cry Out* can be considered unique examples of practice that may carry useful information for other practitioners in the same position.

Since the script development process can vary according to the specific film production and can mean different things for the people involved (Batty, 2016), the three research contexts presented as part of this thesis allowed me to observe some common patterns in the collaborative work between the filmmaker and the scientist while developing the narratives and the scripts. *Interstellar* (2015) is a fictional film, featuring drought and famine, that was produced in the Hollywood industry but was created upon the premise of highly scientific authenticity. *Be Tradition* (2017), due to its mode of production, can be seen as a corporate video about sustainable energy, and was produced in an academic context in order to attract investors. *The Dead Cry Out* is a screenplay about water pollution generated by flooding written in a collaboration between scholars and practitioners, which could eventually be produced with a budget that would categorise it as an indie film. Thus, these productions represented three different sites that helped find answers to a common set of questions.

Despite the use of a practice-led methodology that favours the subjective view of the researcher, the exegeses of the making of *Be Tradition* and *The Dead Cry Out* were completed with three interviews that I conducted with my collaborators in order to take their experience into account while analysing the script development process in these projects. The interviews with Dr Andreoli (appendix B), Dr Finnegan (appendix C) and the director Oisín Mac Coille (appendix D) lasted between forty minutes to one hour. While my set of questions for each interviewee, including Kip Thorne, included three *fixed elements*, i.e. an account of the person’s experience in *pre-production*, *production* and *post-production* stages, other questions were either asked according to their specific work or based on previous responses that the

person gave to the fixed questions. For the writing of *The Dead Cry Out*, I also consulted a geologist, Dr Lynda Yorke, lecturer at Bangor University (UK). An account of the conversation with Dr Yorke, specifically her explanation of the science concepts that we embedded in *The Dead Cry Out*, can be found in the exegesis in chapter 5.

All the interviews for this research were recorded with an H1 handy recorder and stored on a personal hard drive. For all the interviews, including the conversation with Dr Yorke, I secured ethical clearance from Bangor University Ethics Committee and each interviewee gave informed consent and permission not to be anonymised. All the signed consent forms can be found in appendix H.

Reflexivity

Among the different methods that were used in this study, *reflexivity* was a crucial practice during the analysis of my work. *Reflexivity* is an old procedure in qualitative studies that allows the preservation of the researcher's own subjectivity within the process and helps prevent that the researcher becomes 'absent from' or 'above' the contexts under investigation (Bott, 2010: 159). *Reflexivity* in qualitative research has a long history spanning at least a century (Finlay, 2002: 209), and remains a paramount exercise in the more contemporary practice-led approaches to research in the humanities. The method indicates that the research process will involve the active construction of the interpretations of the person's experience through continual internal dialogue and critical self-evaluation (Herz, 1997; Berger, 2015) in order to understand how the investigator's behaviours and beliefs may have influenced the study and the knowledge that came about (Russell and Kelly, 2002). Having started a lecturing career in media and film studies in 2015 and having developed personal opinions on the subjects, to be reflexive has encouraged me to be cautious but truthful when formulating certain claims based on my experience in this research.

The 'reflexive knowledge' generated through qualitative and social research can provide insights not only on the researcher's own experience but also on the workings of the world (Berg, 2007). "Since the researcher is the primary instrument for the data collection and the analysis, reflexivity is deemed essential" (Watt, 2007: 82) for guaranteeing the quality of the research and for "maintaining a balance between the personal and the universal" in such intense and time-consuming investigations (Berger, 2015: 220). Biases, subjectivity, and personal interpretations are inevitable characteristics in practice-led research. Despite the guidelines and direction given in the research methods literature, "each project is unique and

ultimately it is up to the individual to determine what works best” (Watt, 2007: 82). In addition, as the practice-led analytical approach will be tailored to each specific project, the final destination for the inquirer will also remain unique (Watt, 2007: 95). Nonetheless, *reflexivity* can help to overcome the ethical issues and biases related to the practice-led methodology, as this method encourages scholars to be self-critical and to explicitly acknowledge that any research is partisan, partial and fundamentally bound to the context and rhetoric of the investigation (Finlay, 2002: 211). Such acknowledgement, especially in studies like mine, would help “increase the integrity and trustworthiness of the findings” (Finlay, 2002: 210).

At some point in history, the value of *reflexivity* was challenged by positivist ideals but in the last couple of decades, probably because of a return to the importance of the practice and the researcher’s personal experience for the generation of new knowledge, there has been a growing recognition of the importance of this method in academia. Practice-led research will always and inevitably raise questions regarding the validity of the study due to the subjective approach to the analysis. Along with the researchers’ background, their language and their personal life experiences, the fear is that all these elements will have a significant effect on the situation/subject studied, which will in turn shape the findings and conclusions of the research (Berger, 2015). *Reflexivity* is a valuable tool for evaluating such research processes and their outcomes through constant and careful scrutiny of the work undertaken and the decision-making process. Thus, for this screen production research, I carefully monitored my process of investigation, kept an account of the various events which shaped my projects, but I also referred to my collaborators experience while trying to be reflexive, in order to make a study in collaborative scrip development relevant and plausible for both my fields of study and the wider industry. These accounts and processes are shown through the exegeses in chapter 4 and 5.

Chapters breakdown

This research opens with *Chapter 2*, which presents a review of selected literature in screenwriting theory, film production, science communication, climate change communication and ecocinema. In particular, the review focuses on academic research on script development as a collaborative process, scientists as consultants in film productions, audience reception of climate change films, and visual representation of climate change in factual and fictional films. Although studies in visual climate change communication rarely present an analysis of the production processes, the knowledge generated by this set of literature informed and influenced

both the study and the development of the screenworks presented in this thesis. Given the importance of screen production as the framework for this research, Chapter 2 begins with a review of the studies in screenwriting theory and the central debates around script development, highlighting that this is a collaborative process that can vary according to the specific production context. A selection of texts in the field of science communication offers some insights into the production of science fiction films, including those about environmental disasters. In particular, the review concentrates on Kirby's seminal work on the role of the scientist as a consultant in the making of fictional films (Kirby, 2013). In this review, Kirby's studies are also used as an introduction to further literature about scientific *authenticity* in fiction films (Kirby, 2003; 2014), cognitive psychology (Green et al., 2004; Moyer-Guse', 2008) and the public's reception of cli-fi films (Leiserowitz, 2004; Lowe et al, 2006, O'Neill and Nicholson-Cole's 2009). From a review of the research in science communication the chapter moves on to a collection of studies in visual climate change communication that analyses the use of climate change images in the media (Manzo, 2010; Nerlich and Jaspal, 2013), television programmes and documentaries (Mellor, 2009; Campbell, 2014; Jackson 2015), with a focus on a small set of research that address climate fiction films in particular (Salvador and Norton, 2011; Svoboda, 2016; Manzo, 2017). Research into visual climate change communication, also embedded in the field of environmental communication, includes the analysis of the different kinds of emotions and reactions that such depictions of climate change may trigger for the audience, and the audio-visual strategies used by screen works that deal with the subject of climate change. These research areas apply a variety of different methods, approaches and theoretical frameworks to the study of both theory and practice by examining the role, techniques and influences of communication in environmental affairs (Meisner, 2015), making them valuable contributors to the study of the script development of cli-fi films. The review continues with an analysis of some critical discourses in ecocinema, a branch of critical scholarship that investigates cinema's intersections with environmental understandings (Rust and Monani, 2013), in relation to climate change (Weik von Mossner, 2013; Brereton, 2015) and provides academic definitions of the cli-fi genre and speculative fiction (Irr, 2017; Oziewicz, 2017). Despite the usefulness of this set of literature in informing and supporting this study, the review reveals that there is a significant lack of studies of the production stages of cli-fi films, and specifically the script development process, in all of the fields above. While the fields of climate change and science communication would benefit from a further investigation of how filmmakers and scientists approach the incorporation of science in a script (Kirby, 2014), the review concludes that a greater study of collaborative

script development is also needed in screenwriting research (Kerrigan and Batty, 2016), including the analysis of the filmmaking process in interdisciplinary contexts (Cortese, 2018).

Chapter 3 is dedicated to the case study of *Interstellar* (2014), a climate fiction film (hereafter ‘cli-fi’) written and directed by Jonathan and Christopher Nolan in collaboration with the Nobel Prize physicist, and Professor Emeritus at the California Institute of Technology, Kip Thorne. Despite the two-thirds of the film set in space and the clear focus on space travel, *Interstellar* has been acclaimed by critics and climate experts as one of the six must-see movies about climate change (Climate Reality, 2018), ranking fourth highest in the world box office for a cli-fi film (Svoboda, 2016) and voted fourth best cli-fi on IMDb (2019). The case of *Interstellar* was key to this study in that the idea for the film and the initial treatment were written by Thorne and subsequently presented to the Hollywood film industry with help from the producer Lynda Obst. Compared to other cases, Thorne was not simply a consultant on this production, but an integral part of the script development and production process. The chapter presents an analysis of Thorne’s involvement in the writing, producing and editing of *Interstellar* in collaboration with the Nolan brothers, supported by direct quotes from an interview that I conducted with the professor, and his words from the book *The Science of Interstellar* (2014). While the book discloses pivotal information regarding the production, most of it is dedicated to the astrophysical science that led Thorne to win the Nobel Prize and that inspired this film. An interview with Thorne was necessary to allow a conversation on the making of *Interstellar* as a cli-fi film and in particular on the writing of act 1 of the film, which introduces the environmental disaster. Despite the lack of a direct testimony from the Nolan brothers about their experience in the making of *Interstellar*, the case study uses data from existing interviews with the screenwriter and director to generate further knowledge about the collaborative process during the development of the story and script. With a focus on the negotiations between the scientist and the screenwriter/filmmaker for the incorporation of the science in the narrative, the case study of *Interstellar* was a valuable support and inspiration in the creation of the two outputs in this practice-led research. The chapter concludes that for an analysis of the collaborative script development process of the cli-fi it is necessary to look beyond the pages of the screenplay and highlights that both the embedding on the science and the development of the script are fluid and flexible processes that, in a film production, are not confined to a pre-production stage.

Chapter 4 provides an analysis of my experience in the production of a short cli-fi film in collaboration with a science expert. Specifically, this exegesis illustrates how I embraced the role of the screenwriter and filmmaker while producing the short film with Enrico Andreoli,

Associate Professor and group leader at the *Energy Safety Research Institute* (ESRI) of Swansea University. Andreoli's work and research focus on *Carbon Capture, Utilisation, and Storage* (CCUS) with the aim of finding new ways for developing sustainable material that can enable the use of carbon dioxide (CO₂) as fuel with renewable energy. The making of this fictional short, *Be Tradition* (2017), was part of a research grant from the *Sêr Cymru, Welsh National Research Network in Advanced Engineering and Materials* (NRN) and a second grant from the *UK Engineering and Physical Sciences Research Council* (EPSRC). Filmed in the south of Italy, *Be Tradition* translates the concept of *sustainability* through one of cultural and culinary *traditions*. Information about the project and a link to the film can be found through the Swansea University ESRI website (link: <http://www.esri-swansea.org/en/be-tradition.htm>). The making of *Be Tradition* is an example of how the screenwriter/filmmaker works inside the academy to produce a film as a form of interdisciplinary research while facing not only the challenges of collaboration but also the limitation posed by the aforementioned agendas. This chapter will show how the initial conversations with Andreoli, the application for funding and the negotiations for the embedding of the science in pre-production affected the script development process and the final product. In this chapter, I argue that producing film projects while engaged as an academic creates an additional complex factor in specifying the filmmaker's identity as it brings a different approach to production and a different set of challenges to that of the industry (Webb, 2018: 176). The analysis in this chapter identifies some of the differences whilst highlighting the similarities between the collaborative script development process in an academic context and that of the film industry. Overall, the exegesis focuses on the development of the screen idea, from its generation to the final editing of the film in post-production, considering it as an integral aspect of the script development process that allows observing both the individual contribution and the process within the group contexts (Macdonald, 2021). The chapter concludes that the dichotomy between the scientist's and the filmmaker's ontological and epistemological beliefs can significantly slow down the script development process. The exegesis shows the challenges of interdisciplinary collaborations and, in our case, it argues that the communication of the screen idea in the pre-production stage might be facilitated by the production of other supporting documents such as story-boarding or pre-visualisation images. The analysis also shows that to place the emphasis on scientific concepts and techniques during the script development process causes an inevitable delay with the kind of work and reflections that are expected from the creative process. The chapter also examines how the development of the script for this short cli-fi involved the writing of additional text in post-production to create a specific link between the metaphor and the science

behind the film. In the end, I argue that the construction of this additional text as motion graphics in post-production should be seen as an integral part of the script development process and an enhancement of the screen idea, rather than an isolated event in the production.

Chapter 5 is the exegesis of my second project, the feature-length environmental thriller *The Dead Cry Out*, written in collaboration with the screenwriter Dr John Finnegan, senior lecturer in screenwriting at Falmouth University, and the film director, Oisín Mac Coille. For the script development of *The Dead Cry Out*, I positioned myself as both the writer and the climate change communication expert in order to imitate the role of the scientists that I observed in the previous contexts. *The Dead Cry Out* is the story of a doctoral student, Amanda Devlin, who visits a remote Irish island in search of her estranged brother-in-law, only to discover that the God-fearing community may be behind his disappearance in order to protect a dark secret about their home. *The Dead Cry Out* was produced as a podcast series in 2019 by *The Script Department Ltd.* and the script reading was performed by the actor Allen Leech (*Downton Abbey*, *Bohemian Rhapsody*, *The Imitation Game*). In 2021, the series was also featured on *BBC Sounds*. The reader can access the podcast through the following link: <https://www.thescriptdepartment.net/thedeadcryout>. This chapter provides an analysis of the writing of the screenplay for *The Dead Cry Out* prior to its release as a podcast since these further stages of production and distribution were not part of the research undertaken for this thesis. The exegesis in this chapter will specifically refer to Draft 4 of the screenplay, which can be found in the appendices. In the chapter, I reflect on the collaborative writing process, my role as the climate communication expert, and the role of my collaborators. As in the previous chapters, my analysis is supported by quotes from interviews with my collaborators about their experience in this project. The exegesis also illustrates the challenges and constraints posed by this collaboration and how the inclusion of climate science was negotiated and incorporated into the story. While the exegesis of the short film *Be Tradition* allowed for an observation of the filmmaking process in its entirety, the investigation of the collaborative process in *The Dead Cry Out* facilitated a closer observation of how the story and the script development process were affected by the embedding of the science. While Thorne's and Andreoli's interest was to promote scientific research through a fictional film, this time my collaborators had a different agenda, one that belongs to the entertainment industry. The script development process of *The Dead Cry Out* was primarily experimental although, as the chapter will discuss, it followed most of the conventions of the film industry – in this case, implemented by the role of Finnegan and Mac Coille in the production. The first section of this chapter shows the generation of the screen idea for *The Dead Cry Out* and how climate change and the

science struggled to find their place in the initial structure and treatment of the story. In the end, this chapter claims that in the collaborative development of a cli-fi, negotiations for creativity and authenticity are necessary and that the development of speculative scenarios for the embedding of the science in cli-fi films is inevitable. Nonetheless, the authenticity of the narrative stands out if we consider the integrity of the script development process through which the scientific concepts were integrated.

Finally, Chapter 6 presents conclusions, findings and reflections deriving from the analytical chapters while answering the research questions, as outlined in this introductory chapter. In its final remarks, this thesis concludes that, as demonstrated through the case study and the practice-led research, the development of speculative scenarios and the embedding of scientific concepts in the script for a cli-fi film are more than a simple case of putting together isolated events/elements in a few scenes. The writing and making of these scenarios for the screen is an extensive process that involves the understanding of the scientific concepts, the synthesis of these concepts, and the creation of scenes that allow for the embedding of these elements through dialogue, action and world descriptions.

CHAPTER 2

Literature Review

Introduction

Although positioned in the screen-production-research framework, the analyses and exegeses in this thesis relied on other subjects in order to support the interdisciplinary nature of the investigation. Due to a dearth of academic literature exploring interdisciplinary-collaborative script development in the production of climate fiction films, this research inevitably led to the exploration of fields such as science communication, climate change communication, environmental communication and ecocinema. What these research fields have in common is the consideration of the different agents involved in the process of communication of climate change and climate science in the media, from the communication designers to the lay-public, which makes it useful for a research that aims to investigate the role of the different parties involved in the script development of a cli-fi film and what leads their choices. The field of science communication, which aims to enhance public scientific awareness and understanding (Burns et al., 2003), offers some insights into the production of science fiction films, including those about environmental disasters. In particular, this review concentrates on Kirby's seminal work on the role of the scientist as a consultant in the making of fiction films (Kirby, 2013). In this review, Kirby's studies are also used as an introduction to further literature about scientific *authenticity* in fiction films (Kirby, 2003; 2014), cognitive psychology (Green et al., 2004; Moyer-Guse', 2008) and the public's reception of cli-fi films (Leiserowitz, 2004; Lowe et al, 2006, O'Neill and Nicholson-Cole's 2009). From a review of the research in science communication the chapter moves on to a collection of studies in visual climate change communication that analyses the use of climate change images in the media (Manzo, 2010; Nerlich and Jaspal, 2013), television programmes and documentaries (Mellor, 2009; Campbell, 2014; Jackson 2015), with a focus on a small set of research that address climate fiction films in particular (Salvador and Norton, 2011; Svoboda, 2016; Manzo, 2017). Research into visual climate change communication, also embedded in the field of environmental communication, includes the analysis of the different kinds of emotions and reactions that such depictions of climate change may trigger for the audience, and the audio-visual strategies used by screen works that deal with the subject of climate change. Environmental and climate change communication are both highly interdisciplinary fields of research that address a wide range of issues relevant to the communication of climate change and climate science through texts,

images and audio-visual narratives (Ballantyne, 2016). These research areas apply a variety of different methods, approaches and theoretical frameworks to the study of both theory and practice by examining the role, techniques and influences of communication in environmental affairs (Meisner, 2015), making them valuable contributors to the study of the script development of cli-fi films. The review continues with an analysis of some critical discourses in ecocinema, a branch of critical scholarship that investigates cinema's intersections with environmental understandings (Rust and Monani, 2013), in relation to climate change (Weik von Mossner, 2013; Brereton, 2015) and provides academic definitions of the cli-fi genre and speculative fiction (Irr, 2017; Oziewicz, 2017). Despite the usefulness of this set of literature in informing and supporting this study, the review reveals that there is a significant lack of studies of the production stages of cli-fi films in all of the fields above. While the field of science communication would benefit from a further investigation of how filmmakers and scientists approach the incorporation of science in a script (Kirby, 2014), a greater study of collaborative script development is also needed in screenwriting (Kerrigan and Batty, 2016), including the analysis of the filmmaking process in interdisciplinary contexts (Cortese, 2018). Due to the pivotal role of screen production research as a framework for this thesis, the chapter begins with a review of the studies in screenwriting and the central debates around script development.

Screenwriting and script development

Screenwriting research is an interdisciplinary field that invites practitioners and scholars from a broad range of professional and academic contexts. Besides more predictable areas such as film, television and video-game production, researchers in screenwriting may come from English literature departments, media and communication studies, modern languages and cultural studies (Price, 2017). Before 2007-10 most of the work published in screenwriting was limited to screenwriting manuals, which overlooked several aspects of this practice (Batty, 2014; Price, 2017). Thus, the aim of screenwriting research has been to generate new knowledge on the practice of writing individual scripts in order to inform the creative work of future screenwriters. However, in the past few years, there has been a growing recognition in the field of the importance of exploring the development process of these projects in full. Taking into consideration this research, the benefit of looking beyond the script is that it opens an opportunity to investigate the challenges of the collaboration and its impact on the development of the story and the screenplay. Batty et al. (2018) discuss the complexity of

examining this process, as “the object at the heart of script development will be defined differently by people who perform different roles [in the production]” (Batty et al., 2018: 160). Batty et al. (2017) provide some definitions of script development and conclude that “what all these definitions have in common is the element of *collaboration*” (Batty et al., 2017: 227). Among those quotes, it is useful to highlight Peter Bloore’s (2012) insightful description of script development:

Screenplay development is the creative and industrial collaborative process in which a story idea (either an original idea or an adaptation of an existing idea, such as a play, novel, or real life event) is turned into a script; and is then repeatedly rewritten to reach a stage when it is attractive to a suitable director, actors and relevant film production funders; so that enough money can be raised to get the film made.

(Bloore 2012: 9)

Applied to my study, such definition partially describes the process taken for the development of my screenplay. While this is an accurate description when looking at the development of *The Dead Cry Out*, the case of *Be Tradition* and *Interstellar* show that the development of the script and the story continues beyond pre-production stages – after the money was raised. Thus, the different time frames of the development and the role that script development plays in a specific context of production makes the task of defining this process even harder (Taylor and Batty, 2016: 206-211).

One way to expand on such definitions and research is to take into consideration Ian W. Macdonald’s definition of the ‘screen idea’, a key concept in the inception of any individual or collaborative development of a screenwork (Parker, 1999: 57). Macdonald uses the term ‘screen idea’ to indicate “any notion of a potential screenwork held by one or more people, whether or not it is possible to describe it on paper or by other means” (Macdonald, 2004: 90). It is then a theoretical term that describes a singular concept that is envisioned to become a screenwork, and the screenplay can be seen as “a record of the shared screen idea, redrafted in stages as the collaboration proceeds” (Macdonald, 2004: 91). According to Macdonald, the screenplay, when viewed in relation to its finished film counterpart, is not a completed piece of work and so to concentrate on the screenplay alone for the study of the development of the screenwork seems unsatisfactory (Macdonald, 2004: 90). To observe the process of development of the screen idea allows the practitioner/academic to analyse the collaboration, which involves the reading (and re-reading) of notes, discussion and redrafting, and creating (and re-creating) something that represents a common understanding. By using the concept of the ‘shared’ screen idea in my study I was able to better analyse the script development process

as I took into consideration not only my writing but also the influence of my collaborators while shaping our screenworks and the norms surrounding this process – aspects which would otherwise be hidden or remain unacknowledged if I only focused on the script (Macdonald, 2004: 97).

Nonetheless, to study screenwriting is also to consider the writing of the screenplay: the rules and constraints of its form on the page, its various components, the conventions and norms that the screenwriter follows in order to meet the industry requirements. To analyse the construction of the screenplays presented in this thesis, I use the notions of narrative, story, plot, genre and theme as theorised by Parker (1999; 2000). When referring to *narrative* and *story*, Parker provides some guidelines on how to distinguish the two. He suggests that the term *narrative* should be used to describe “the totality of formal and diegetic elements in a screenwork”, while story and plot, as well as genre and theme, should be considered as elements of the narrative (Parker, 2000: 66). *Story*, instead, is “a pattern of narrative events which [...] act as a motivation framework for the character”; without a story, such characters would have nothing to do and would be a mere presence in the narrative (Parker, 2000: 67). On the other hand, the *plot* can be seen as a combination of the stories and other narrative elements. The recognition of the bond between character and plot is extremely important in screenwriting. According to Batty and Waldeback (2019), “the plot – a sequence of events – is devised to bring about a character’s development (act); character – the agent of a story – only develops because he or she undertakes the plot” (Batty and Waldeback, 2019: 15). By separating these terms, according to Parker (2000), the writer/reader should also have a better understanding of genre, theme and style and how these have an impact on the narrative.

Particularly relevant for this study is the concept of *theme*. While it is clear that every narrative has its particular theme, Parker (1999) argues that themes can be grouped under eight categories “which express major human experiences and reflect common emotional needs” (Parker, 1999: 91). These themes are the desire for justice, the pursuit of love, the morality of individuals, a desire for order, the pursuit of pleasure, a fear of death, fear of the unknown, and desire for validation. Particularly relevant for this study are the last three themes, which will be further explored in relation to each of the narratives presented in the case study and the exegeses. As I focus on the development of the screen idea, when talking about genre, I will refer to Parker’s four universal *genres*: the personal drama, the thriller, the horror, and the romance. Parker (1999), suggests that each of these categories contains other sub-genres and that these genres contain a set of universal patterns, a combination of narrative elements that screenwriters and audiences use to interpret the screenwork (Parker, 2000: 72). To grasp the

commonality of human experience is a key to understand how and why narratives can transcend cultures and time, which is one of the primary concerns for the screenwriter. The last key concept to be taken into consideration for my analyses is the notion of *style*. According to Parker (1999; 2000), there is always been confusion about the use of the word style for the writer (i.e. how the words are used on the page), and the director's style (i.e. the style of a particular screenwork). In this study, *style* will be discussed primarily from the director's perspective, in order to facilitate the analysis of the screenworks that are presented in this thesis (i.e. *Interstellar* and *Be Tradition*) and attempt to provide a vision for the future making of *The Dead Cry Out*. *Style* can be considered as "a set of narrative devices which - when used together - form a unifying bond between the disparate elements of the narrative and the audience" (Parker, 2000: 73). For example, while from a screenwriting perspective *Interstellar* could be considered either as a drama or a thriller, if we look at the style this can be recognised by the filmmaker and the audience as sci-fi or a cli-fi. The last section of this review will also provide some specific definition of the cli-fi, on which this study concentrates, and will list some of the features and narratives that allow identifying this genre in literature and in the film industry.

The production of science-fiction films

Most of the research into the production of science fiction films to date has primarily focused on discussions about the role of science experts as consultants in these productions (Kirby, 2014: 3), highlighting the motivations that can lead the different communities of entertainment and science to enter into a relationship (Kirby, 2013: 16). In the 'Golden Age' for science in movies, as described by Kirby (2014), scientists support filmmakers in such collaborations in several ways: from fact-checking and enhancing the plausibility of the story to shaping visual iconography and helping create dramatic scenarios. The science consultant is often brought in to comment on scientific matters involving the script, but he can end up helping with the sets, props, the actors, and other relevant aspects of the production (Kirby, 2013). Both the entertainment industry and the scientific community clearly benefit from this arrangement; while the former gains from the scientist's work in adding plausibility and 'visual splendour' to the audience's enjoyment (Kirby, 2013: 19), the latter can profit from promoting research agendas, stimulate technological development, and even encourage political action (Kirby, 2014: 5).

Filmmakers usually ask scientists to help them use science as a tool for creating new speculative fictional scenarios, meaning that this process is more than a simple transfer of

knowledge. As explained by Kirby, such a process would involve “the synthesis of information from the culture of science, the translation of that information into the culture of entertainment, and finally the transformation of the information into a finished cultural product” (Kirby, 2013: 11). This scientific information can be a starting point for the filmmaker who ultimately will use their professional judgement to determine to what extent these scientific facts can alter the narrative and its production. This will depend on production constraints such as budgets and technical limitations but also narrative necessity, dramatic needs and aesthetic requirements (Kirby, 2013: 221). Science consultants can be involved at any point, from pre-production to post-production stages, and their influence will largely depend on the time when they were asked to collaborate on the project (Kirby, 2013: 14). As specified in previous sections, in the case of my study, the science expert was part of the collaboration from the inception of the screen idea and their role in the production has been investigated throughout the script development stage.

Academic research on science consultants in the entertainment industry has remarked the tension occurring during the production of science fiction films and programmes “not only between the narrative forms of media and those of science, but also between the needs of the entertainment industry and those of the scientific community” (Kirby, 2014: 6). This tension, which can be observed throughout the different steps of negotiations for the embedding of scientific knowledge in the screenwork, requires an amount of *flexibility* from both parties. The notion of *flexibility* is central to these negotiation stages but can become problematic when considering how those scientific facts/concepts can impact public discourses about science (Kirby, 2013: 17). Thus, this flexible approach will affect the meaning of ‘authenticity’ in the context of the science fiction film (Kirby, 2014: 23).

Cinematic representations of science involve the production of images of science, whether or not the image depicts ‘real science’; for this reason, scientists have always shown a significant concern about the audience’s reception of these messages for every new release (Kirby, 2003). Nonetheless, scientific institutions have actively sought relationships with fictional filmmakers or other entertainment media, and such “collaborations can be traced back since 1916, when the Selig Zoo in Los Angeles allowed filmmakers to use its animals for the dramatic film *Thou Shalt Not Yet Covet*” (Kirby, 2003: 266). While not necessarily seeking to promote specific causes, many scientific organisations consider cinema as a means of promoting their work. For example, large, prominent research institutions like NASA established its Entertainment Industry Liaison in the late 1960s, and still actively search for collaborations with Hollywood (Kirby, 2008: 49). For films such as *Deep Impact* (Leder,

1998), *Mission to Mars* (De Palma, 2000) and *Space Cowboys* (Eastwood, 2000), NASA provided technical advice on the sets, access to its scientists for scientific advice, script analysis, and the use of facilities and equipment (Kirby, 2008: 50). NASA also has a role in the film *Interstellar*, though prof. Kip Thorne has worked as an individual scientist to develop the narrative which was then brought to the Hollywood industry.

In the 2008 and 2014 papers, Kirby concludes that despite some development in the analysis of the role of the science consultant in film productions, scholars still need to uncover exactly “how, and why, film-makers produce filmic images of science? How do scriptwriters approach science? How important is science for special effects technicians? What role does science play for production designers or the art department?”. While the last two research questions did not find a space in this thesis, my case study and exegeses aim to investigate how both the screenwriter/filmmaker and the science expert approach the writing of climate fiction.

Authenticity in science fiction and climate fiction film productions

Traditionally, the tension between the scientific community and the entertainment industry are attributed to these two groups’ incommensurable world views and distinct ways of knowing (Kirby, 2013: 219). Therefore, the study of the collaborative development of cli-fi films in a screen-production-research framework required me, as the researcher/practitioner, to take these dichotomies into account by reflecting on the ontology and epistemology believes and differing point of views that characterise the parties involved in the collaborations. To tackle the philosophical concepts of *ontology*, i.e. what we believe constitutes reality (Blaikie, 2000: 8), and *epistemology*, i.e. what can we know and how we do get to that knowledge (Marsh and Furlong, 2002: 18), can also help “defend” the researcher/practitioner’s decision-making process and the knowledge that derives from being part of a certain group (Kerrigan, 2018: 15). Crotty (1998) conflates ontologies and epistemologies and refers to three main frameworks: objectivism, subjectivism and constructionism. If *objectivism* is all about discovering the truth by allowing the scientist to detach from the object of study (Crotty, 1998: 5), in *subjectivism* meaning is imposed on the object by the subject (Crotty, 1998: 9). On the other hand, *constructionism* refuses the idea of the existence of an *objective truth* because truth and meaning come into existence in and out of our engagement with the realities we live in. In this sense, “meaning is not discovered, but constructed” (Crotty, 1998: 8-9). While the filmmaker may look at his work subjectively while constructing the fictional reality and uses

science to generate entertainment value, the scientist tends to concentrate on the truth that the film is trying to portray (Kirby, 2003). Scientists working on fictional films need filmmakers to preserve the accuracy of scientific representations, whereas filmmakers need to claim accuracy for their films, and ask scientists to help them maintain an acceptable level of verisimilitude (Kirby, 2014). This discrepancy in goals clearly leads to multiple interpretations of the term ‘accuracy’. For this reason, Kirby argues that “*authenticity*, rather than accuracy, serves as a better lens by which to approach science in cinema” (Kirby, 2014: 6). Moreover, according to Kirby, “there is no way for audiences to know which depictions are ‘accurate’ and which result from filmmakers’ creative license because all the representations are projected as ‘natural’ through the camera lens” (Kirby, 2003: 273). The “naturalizing” effect of visually based fictional media is one reason why scientists believe that fiction negatively affects the public understanding of science (Kirby, 2003). In the end, *authenticity* is not a fixed term (Kirby, 2008: 42) and, like scientific *accuracy*, it becomes a flexible concept in the context of a fiction film production (Kirby, 2013: 221).

While it has proven difficult to find further studies that specifically discuss the notion of authenticity in the making of climate fiction films, a small set of studies discusses the problematic reference to scientific authenticity when analysing the content and messages of climate change films. Mellor (2009) introduces the problem of debating scientific accuracy in the documentaries *An Inconvenient Truth* (2006), a cinema release, and *The Great Global Warming Swindle* (2007), a Channel 4 production. Mellor argues that “the ambiguous figural status of the image in science documentaries makes accuracy an inadequate means by which to judge such films” and that accuracy should rather be considered “as a property related to the text” (Mellor, 2009: 134, 141). An investigation into the British High Court’s arguments on the accuracy of the images in these two productions showed that “accuracy claims opened up room for more and more debate rather than closing down debate into a final judgment”, failing to resolve the dispute (Mellor, 2009: 142). According to Mellor, accusations about the accuracy in climate change documentaries are formulated without paying the right amount of attention to the rhetoric of the text, which is in fact the key element to assess the truthfulness of these productions. However, one must focus on the text’s integrity and analyse both images and words - which have specific and distinctive roles. The main challenge with environmental/scientific documentary is that we are facing two problems at the same time: 1) the indexical nature of the images and 2) the scientific aspect of the argument. Both these features, especially in expository documentaries such as *An Inconvenient Truth* and the *The Great Global Warming Swindle* (2007), characterised by the voice-of-God narration, edited

footage of interviews from the various experts, and wallpaper shots, significantly diminish the distance between reality and representation in the audience's perception of the story. Moreover, the indexical nature of the documentary and of the image in general, "enables the audience to invest trust in it" (Mellor, 2009: 144). In the case of *An Inconvenient Truth* and the *The Great Global Warming Swindle*, a central role in the subtle 'manipulative' process is also played by the use of graphical visuals, as "graphs are the most highly indexical of the representational techniques of science, tracing as they do data gathered from the material world" (Mellor, 2009: 144). These features of the documentary genre are able to influence the audience in thinking that what they are watching is the actual current state of events in relation to climate change, even though in most of these documentary productions we are dealing with the visualisation of a group of phenomena that have not yet happened (Mellor, 2009: 146). According to Mellor, communication researchers should increase the study of documentary films as, whether distributed in cinemas or through public service broadcasting channels (e.g. BBC channels), the content of documentary films can lead and become central to further public discourse (Mellor, 2009: 135).

Continuing with a discourse about accuracy, Manzo (2017) remarks that both climate change documentaries and climate fiction films "should not be held to higher standards than science itself, which is not expected to tell the whole truth and be perfect" (p. 94). If *accuracy* and *certainty* in film are an issue, then the audience should be reminded that uncertainty in science is normal and scientists have their own way to manage it (Manzo, 2017: 91). However, due to their distinctive role in forming a new public opinion through a partial representation of the whole 'story', both factual and fictional climate change films should be under constant scrutiny and be open to ongoing debate in the same way science is (Manzo, 2017: 93). According to the author, such debate should include discussions on the rhetoric (logos, ethos, pathos) employed in these film forms and should facilitate to generation of other analyses based on production elements such as accuracy and authorial bias. Thus, Manzo's argues that it would be wrong to judge the usefulness of climate change films only on the basis of the degree of scientific accuracy: the assessment on the usefulness of these productions should depend on criteria such as *teachability* and *integrity*. Through the analysis of a handful of factual and fictional English-language films sample, Manzo's paper provides a broad review of what can be appealing for the audience (e.g. celebrity speaking for climate change vs controversy created by the text), what can move the audience to action (e.g. education, emotions, motivation), and what could make people attracted and interested in watching these films (e.g. negative publicity or the film association to a scandal). In the analysis, Manzo considers not only the content of

her selection of films but also cinema in general as an art-form, concluding with a discussion about the 'editing' stage in factual and fictional film productions. The author concludes that editing should not be considered as manipulation or falsification but as a natural step of the production process of films, as every film production will involve steps such as framing, constructing, recording and editing. Therefore, we should not be demanding any different from climate change films.

While Manzo discusses the *usefulness* of climate change, Ramirez-Galindo (2016) reflects on the notion of *credibility* through a visual content analysis of *An Inconvenient Truth* and *The Age of Stupid* (2009). The study asserts that the different ways in which testimonies of climate change threats are presented in these films may have a contrasting effect on the audience and may have a significant impact on the *credibility* of the text and its messages. However, the author acknowledges that the analyses of only two documentaries is not enough to make a definite statement about the audience's perception of these factual films. Whilst urging researchers to broaden the sample of films for analyses in climate change communication, the author suggests that "interviews to producers and audiences could offer the opportunity to uncover the power dimension behind the production of climate change films" (Ramirez-Galindo, 2016: 260).

Audience's reception and responses to climate fiction films

The way science representations are produced and constructed in the cinematic text can have an impact on the public understanding of the science and the way audiences' respond to those depictions and messages (Kirby, 2003; 2014). "Entertainment texts, like popular films, significantly influence people's belief structures by shaping, cultivating, or reinforcing the 'cultural meanings' of science" (Kirby, 2013: 15). Studies of science popularization have showed that the 'meanings of science' may be the most significant element contributing to public perceptions of, and attitude toward, science, reiterating the importance of narrative in science communication (Kirby, 2013: 15). There are several means of communication, but *narrative* is the fundamental mode of human interaction and one of the most efficient way of acquiring and sharing information (Hinyard and Kreuter, 2007), especially if the information has social relevance. Studies 'entertainment-education' argue that fictional narratives can have dramatic effects on audiences by influencing beliefs about social groups and social issues (Slater and Rouner, 2002: 179). Entertainment-education implicates the intentional use of fictional film narratives to raise awareness of social issues and change individual behaviour

(Kirby, 2014: 21), but entertainment media narratives can still have an impact without any pre-conceived agenda (Kirby, 2013). However, the ‘narrative method’ of communication is not confined to the arts, it is also the primary means of communication adopted by social and political institutions (Hinyard and Kreuter, 2007: 2). From this perspective, the goals of the entertainment media and the ones of scientific, social and political organisations are achieved through the use of the same method of communication.

Hinyard and Kreuter (2007), refer to narrative as “any cohesive and coherent story with an identifiable beginning, middle, and end that provides information about scene, characters, and conflict; raises unanswered questions or unresolved conflict; and provides resolution” (Hinyard and Kreuter, 2007: 2). Due to their structure and elements, films narratives would then represent a very useful tool for experts to explain complex scientific concepts and phenomena to the public. Compared with more expository communicative forms, narratives can captivate the audience, provide motivation to continue the story until resolution is reached, and influence the audience to a point that can lead to a behavioural change (Hinyard & Kreuter, 2007). These are extremely valuable features of narratives, especially when the shared information/knowledge is about health and environmental risks (Downs, 2014). One of the biggest challenges for scientists and scientific organisations is to communicate new empirical findings, which very often require people to discard long-held beliefs or familiar structures for understanding the new information. Narrative can help facilitate this process by providing elucidations and explicit examples to which people can relate more easily (Downs, 2014). Furthermore, fictional narratives can be particularly useful when trying to engage members of the audience who have little interest in learning new information (e.g. adolescents, sceptics) (Downs, 2014).

Narrative is at the core of all mass media, but to refer to such broad ‘phrase’ in the study of public understanding of science leads to problematic generalisations about the communication process and reception of scientific knowledge (Kirby, 2003: 261). Compared to news media, for example, film and television programmes provide the space and resources to for the construction of richer visual imagery, dialogue, and music for a more immersive narrative experience (Green et al., 2004). Moreover, the deep engagement with the characters that the individual experiences while watching a film, can help overcome various forms of resistance to persuasive messages embedded in the story (Moyer-Guse’, 2008: 408). According to the *Elaboration-likelihood Model* (Slater and Rouner, 2002), *Entertainment-Persuasion* (Moyer-Guse’, 2008), *Social Cognitive Theory* (Bandura, 2012), and *Transportation-imagery theory* (Green et al., 2004) the success of narratives in persuading the audience is due to three

properties: *memory retrieval processes*, *transportation* and *identification*. Narratives create and reinforce memory traces for better recall and application over time (Downs, 2014: 13627), especially when the experience of watching or reading has been particularly enjoyable (Green et al., 2004: 311). Enjoyment leads to *transportation*, explained by theorists as “a convergent process, where all mental systems and capacities become focused on events occurring in the narrative” (Green and Brock, 2000: 701). In this way, as the viewers are swept into the narrative, they are also less keen or less motivated to counter-argue story points (Green and Brock, 2000). When the scientific experts’ explanatory skills, culture of objectivity, and logical methodology are matched with the filmmakers’ narrative abilities, this combination can contribute a great deal to an audience’s willing suspension of disbeliefs (Kirby, 2013: 223).

Like *transportation*, identification also plays a role into audiences’ engagement with the story. *Identification* is defined as a process “in which an individual perceives another person as similar or at least as a person with whom they might have a social relationship” (Slater and Rouner, 2002: 178; Moyer-Guse’, 2008: 413), and it refers to an emotional and cognitive process where “the viewer forgets about his or her own reality and temporarily becomes the character, taking on the character’s perspective [...], and temporarily replaces his or her own identity with the character” (Cohen, 2001: 251). *Identification* involves four dimensions: “empathic (shared feelings with the character); cognitive (sharing the character’s perspective); motivational (internalizing the character’s goals); and absorption (the loss of self-awareness during the exposure to the narrative)” (Moyer-Guse’, 2008: 410). Screenwriting research has also explored *identification*, not only from the perspective of spectatorship, but also as a tool for the screenwriter while developing/establishing the protagonist’s dramatic ‘goals’, ‘wants’, and ‘needs’ (Cattrysse, 2010). Finnegan, in his 2016 paper on identification studies and its relationship to screenwriting, cites the film *Gladiator* (1999) as an example of how the writer can incorporate identification techniques in the writing screenplay. While it would be hard to relate to the life of Maximus, the Roman General, we can certainly sympathise with Maximus mourning the loss of his mentor and father figure, Emperor Marcus Aurelius, or with his decision to turn his back on the murderous heir Commodus, when he asks for Maximus’ loyalty afterwards. Understanding the character’s choices and actions in relation to goals, wants and needs, “requires the viewer/reader to reflect on their own characteristics, such as bravery or cowardice, or on the many other traits that characters are tested for in cinema” (Finnegan, 2016: 320). For this reason, *identification* can be a method for screenwriters, filmmakers and scientists who are working together to develop a narrative that ultimately depicts a speculative scenario as in the case of science and climate fiction. Nonetheless,

transportation and identification will also depend on other factors such as the quality of the film, the format, the style, genre, and ultimately the audience's personal tastes.

While most of the research in public understanding of science and science communication has concentrated on an analysis of news media, there is a small body of research that has looked at the impact of *The Day After Tomorrow* (2004) on the audience after watching the film (Kirby, 2014; Svoboda, 2016). Lowe et al. (2006) claim that environmental disaster films can have a great influence on the public. Their research, which specifically examined the impact of *The Day after Tomorrow* through a survey of filmgoers in the UK, reveals that the movie changed people's perspective on climate change significantly, at least in the short-term. The results of this study show that most of the viewers expressed a strong motivation to act after watching the film. Although most of the participants did not think that climate change would affect them significantly in their daily lives, they all reported that the film inspired them to search for further information about climate change and 'what to do' in order to help with this global issue (Lowe et al, 2006: 449). Only 5 % of their sample did not see the necessity of taking any actions (Lowe at al. 2006: 453). A study on U.S. audiences by Leiserowitz (2004) generated similar results and adds that, after watching the film, the subjects showed a great willingness to act on the climate change by participating in voting at the end of that election year. On the other hand, scholars such as Sakellari (2015) concluded that despite the film having an effect on the viewers' emotion and willingness to act, it also ended up confusing the audience and raised further concerns. Reussig, Scwharzkopf, and Pohlenz (2004), who interviewed members of the German audience, reported that viewers, after watching the film, felt that it is unlikely that climate change would affect them personally to such an extent. However, Reussig, Scwharzkopf, and Pohlenz (2004) and other studies such as Rust (2013) assert that the publicity and marketing campaigns before and after the release of *The Day After Tomorrow* were successful in increasing public's trust in the role of the scientists by creating a new perception of climate science. Other studies such as Branston (2007) and Perkowitz (2007) also tried to assess the achievements of *The Day After Tomorrow* by analysing its publicity, the media responses to the film, and the reaction of groups who were already debating climate change in the public sphere. These body of research concluded that *The Day After Tomorrow* is to be considered a pivotal example of an 'event film' that attracted significant attention from the news media even though, Branston (2007) suggests, with its 'high-tech and energy intensive spectacle', such productions represent a contradiction to the climate change discourse.

Despite the claims made by this small set of research, audience reception studies on science and films are limited and it is difficult to say exactly what impact fictional movies have on public opinion (Kirby, 2014: 17). Moreover, *The Day After Tomorrow* is just one case, and similar analyses need to be applied to other films in order to truly understand the effects of climate change films on the public and understand their impacts and other trends over time (Svoboda, 2016). Although this brief review on audiences' responses to *The Day After Tomorrow* does not represent the 'full picture', it suggests that fictional films can have a significant role in shaping people's awareness of the risks posed by this global issue. A film may not radically change people's behaviour towards the environment, but it certainly is a starting point to engage the audience with the problem (Downs, 2014) and, as such, a scrutiny of the production of more recent climate fiction film releases is necessary. My research does not focus on measuring the impact of films on the public sphere and climate change, but I sustain that the analysis of the production stages can create new opportunities to discuss the role and effects of climate fiction films in our society. After all, "it is the mediation among scientists, the entertainment industry, and audiences that produces the representation of science in entertainment media" (Kirby, 2003: 263) and a reflection on the relationship between the construction of fictional science, the scientific process, and the public understanding of science can facilitate the analysis of the key players in the production process of cli-fi films.

Visual representations of climate change in the media

Despite the significant lack of studies of the production of climate fiction films, the field of environmental communication and climate change communication provide a set of research on visual representation of climate change in the media that can inform the screenwriter/filmmaker and the science expert in the development process. A review of the literature in these fields reveals that there is a growing body of research involved in the analysis of climate change visual, but most of these studies tend to conduct an analysis of the content rather than the production and construction process (Hansen and Machin, 2013; O'Neill and Smith, 2014). By examining these visual content and thematic analyses of newspapers (Lester and Cottle, 2009; O'Neill, 2013), magazines (Remillard, 2011), advertising campaigns (Doyle, 2007; Hansen and Machin, 2008), television programmes (Campbell, 2014), documentaries (Mellor, 2009; Weik von Mossner 2012) and fictional films (Svoboda, 2016) it is possible to provide/create a list of those images/frames/themes that are most commonly associated with climate change:

- Impacts of climate change (e.g. images locations destroyed by natural events, victims)

- Impacts of climate change on Polar regions - before and after shots - (e.g. images of melting glaciers, ice sheet cracks, lonely polar bear);
- Causes of climate change (e.g. images of factories and smokestacks);
- Personification of climate change (e.g. images of politicians, celebrities, scientists)
- Computer generated images (e.g. satellite images of the Earth);
- Logos and graphics (e.g. line graph of increasing CO₂ emissions)
- Images of nature as pristine (e.g. picturesque images of an unexploited environments).
- images of mitigation and solutions (e.g. images of renewable energy structures).

Some of these analyses also include a discussion about the emotions and reactions that certain images of climate change might trigger in the audience. For example, through a visual thematic analysis of images accompanying the media coverage of the 2011 IPCC report, Nerlich and Jaspal (2013) highlights some of the issues of representing climate change with images of extreme weather events (e.g. floods, droughts, heat waves, hurricanes and ice/sea-level rising). According to the authors, all these images, to some extent, symbolise emotional responses, such as fear, guilt, vulnerability and helplessness and “may thus lead to disengagement rather than engagement with the issues of climate change” (Nerlich and Jaspal, 2013: 253).

On a similar note, Manzo (2010) analyses the use of documentary photography in UK media for the communication of climate change. While the author recognises the difficulties in claiming with certainty the extent of the impact of certain images on the audience, she discusses some cases of ‘paradoxical visuals’, i.e. images that make climate change seem important while simultaneously making participants feel most unable to do anything about it (Manzo, 2010: 198). These representations include images of starving children due to droughts, images of houses and cars submerged by floods, and images of the lonely polar bear. According to Manzo, graphs, maps, and atlas produced by governmental organisations for showing rising temperatures and percentages of CO₂ emissions can also be counter-productive for public engagement. Maps that spatialise danger are a traditional tool of geopolitics and thus they could remind the public that such visuals serve political interests as much as the interests of science (Manzo, 2010: 203-205). Manzo concludes that just as dry statistics are a ‘turn-off’ for some, simplistic correlations between climate change and images of famine will alienate those who think of the latter in relation to complex political emergencies rather than natural disasters (Manzo, 2010: 199). However, for the author, the issue seems to be documentary photography per se rather than the specific kind images. “The point is not that particular photographs are

good or bad, right or wrong, but that complexity, invisibility, and change are inherently difficult to capture – especially at a single moment in time” (Manzo, 2010: 206-207).

Whilst most research in visual climate change and environmental communication have focused on the analysis of images in news report, a small group of studies have explored visual representations of climate change in factual television and documentaries. Campbell (2014) investigates how environmental risks and natural disasters are framed in factual entertainment television and remarks a strong correlation between news-media visual frames of natural disasters and the ones employed by entertainment television. Campbell analyses a sample of television programmes of early 2000s, including series from BBC, Discovery Channel, National Geographic. Whether dealing with recent, pre-historic, or future disaster events, these programmes, described by some critics as “weather porn”, portray the image of “essentially inevitable” and “completely natural” catastrophes, eliminating any discourse on human agency, government bodies’ preparedness, or plans for mitigations (Campbell, 2014: 66). Even when there is an attempt to address these issues, these programmes show human responses to the disaster as ineffectual (Campbell, 2014: 67). While avoiding the featuring of representative figures (e.g. politicians, rescue organizations etc.), these programmes remove the role of the ‘villain’, and consequently the discourse on human agency and social responsibility from the story. Thus, “the notion of disasters occurring within particular socio-political contexts [in these programmes] is routinely subordinated by an emphasis on individualised experiential accounts” (Campbell, 2014: 68). The only authoritative voices in these programmes are the scientists, mostly portrayed through the expert “talking head” shot – a highly conventional science documentary trope. In this instance, the scientist is positioned outside the context of the disaster that is being narrated in the episode and the interview is conducted in an office of a laboratory. According to Campbell, to have a scientist that is physically dislocated from the image of the disaster causes a sense of detachment from the event (Campbell, 2014: 68). The focus on disaster survivors and image of destroyed environments in these programmes can be associate with the production choice of using an apocalyptic narrative. Nonetheless, the author argues that by concentrating on the testimony of people affected by the disaster these programmes depict an event that is indeed “survivable”, which may increase the chances for the audience to enjoy such stories (Campbell, 2014: 71). Campbell concludes that to try to make the communication of environmental risks entertaining is not in itself problematic, but the ways in which producers of factual entertainment television programmes try to achieve this do raise concerns about the nature and quality of the communication of these risks (Campbell, 2014: 71).

Another set of research provide the analysis of climate change documentaries that won several awards and were recognised as key to the climate change discourse by both governmental and non-governmental organisations. Weik von Mossner (2012) examines the filmmaking strategies and the use of the ‘fear rhetoric’ in the documentaries *Before the Flood* (Lindsay, 2004), *There Once Was an Island: Te Henua e Nnoho* (March, 2010) and *Climate Refugees* (Nash, 2010) which, according to the author, can be considered as vehicles for developing what Ulrich Beck (2011) refers to as ‘ecological cosmopolitanism’. Following Beck’s sociological theories on risk, Weik von Mossner suggests that it is through emotions such a fear and through the realisation of the shared risks that people will understand that they can either ‘collaborate or perish’. From this perspective, it will be neither compassion nor ethical concerns for humans and nature to bring the population to such ecological cosmopolitanism: it will be the frightening knowledge of present and future transnational repercussions to mark “the end of the other” (Beck, 2009). Nonetheless, the author remarks that the directors of these documentaries, in addition to being praised for raising awareness of the complex issue of climate change, were also often criticised for the use of an alarmist tone and fear-mongering tendencies. Concepts such *fear* and *risk* are central to the study of the communication of climate change through factual and fictional media. Authors such as Beck and Giddens describe individuals living in a risk society where the fear of shared risks can impact different aspects of our existence.

Key to the risk society is the role of the media is shaping our perception of environmental risks such as climate change, a perception which has changed through the centuries. Beck (1992) and Giddens (1990) refer to a pre-industrial time when men would consider a natural disaster as an ‘act of god’ to a change in modern times when risks and natural disasters are considered as manufactured and man-made. As Beck describes, with the technological advancements, we switched the focus of our anxiety from “what nature can do to us” to “what we have done to nature” (Beck, 1998: 10). Giddens also refers to this transformation as the *end of nature* and the *end of tradition* (Giddens, 1990). However, *end of nature* does not mean that we live in a world were nature is about to end: the expression refers to the fact that, at this point, every aspect of the physical world has been touched by human intervention. However, both Beck and Giddens, along with several scholars of risk communication, relate these changes in perception to the way climate change is communicate through the media, both through texts and images.

Jackson (2015) examines the problematic use of a ‘glacier-ruin narrative’ for the communication of anthropogenic climate change in the documentary *Chasing Ice* (Orlowski,

2012). Jackson explains that, in recent years, this specific narrative has shifted from one of glaciers as ‘endangered species’ (i.e. glaciers that are not dead but that must be saved) to one of ‘ruined glaciers’ (i.e. a situation where the glacier is now just a ‘ruin’ and there is nothing left to save), which would “reveal tendencies by different actors involved with climate change to control, reduce, and limit the range of imaginable climate change futures” (Jackson, 2015: 480). The author argues that these narratives wrongly pre-determine a future without ice, reducing the variety of glaciers on the planet to the existence of ‘one single glacier’ in the lay-public collective imagination. In the case of *Chasing Ice*, Jackson observes that the footage generated by both the photographer Balog and the film director Orlowski can be understood “as evidence of what once was, as social memory for glaciers that will not exist much longer” (Jackson, 2015: 486). In other words, Orlowski and Balog’s work suggests that glaciers are *ruins*; they are the remains of our environment. For example, at the end of the film Balog is seen walking among broken remnants of the glaciers, in a shot that does not include the big glacier that still exists in that same location. From this perspective, the future of the world and the human race is difficult to envision and, according to author, it might be easier to engage with “such imaginings of the future [...] if they were hung upon a familiar point” rather than distant glaciers (Jackson, 2015: 488). Jackson reports that on Earth Day 2013, *Chasing Ice* was screened at the White House for policymakers and staffers, remarking the need for studying such documentary productions with greater attention. Award-winning documentary such as *Chasing Ice*, characterised by “reductionist” and “loss-centric” tendencies, are “revelatory of growing climate change anxieties within the cultural imaginary” and can lead to audience’s misinterpretation of what is really going on in the Arctic regions (Jackson, 2015: 489).

To summarise, most of these studies seem to follow O’Neill and Nicholson-Cole’s (2009) suggestion that fear messages in climate change communication can distance audiences from the issue by making them feel overwhelmed and helpless. On the other hand, according to the authors, the embedding of positive messages in climate change visual narratives would increase the chances of engaging the viewers/readers by giving them a sense of agency. Although shocking and catastrophic representations can be used as an initial hook for attracting people’s attention and raise concern, such images fail to motivate personal engagement with climate change and may trigger barriers such as denial and other negative or passive responses to the issue (O’Neill and Nicholson-Cole, 2009: 375). Moreover, scholars of ecocinema such as Brereton (2015), through an analysis of films such as *The Day After Tomorrow*, *Wall-e* and *Avatar*, suggests that if the narrative fails to reach the affective sphere of public engagement, it will probably not persuade the viewer to any behavioural change. On this point, Weik von

Mossner (2013) adds that no matter what the film depicts, if viewers do not believe that a rise in global sea levels, desertification, runaway climate change, and the extinction of mammals are among the possible future consequences of our current practices then it is unlikely that they will be able to engage with the messages of the film (Weik von Mossner, 2013: 114). In the case of documentary films such as *The Age of Stupid* and *An Inconvenient Truth* this becomes even more complicate because if the viewers do not trust the filmmaker, they will probably understand the documentary as a misrepresentation of the truth and consider it a piece of fiction. In the end, according to the author, for a documentary to simply state that its information is coming from scientific projections will not be enough to change people's perspective on climate change and on the film in general.

On the other hand, Minster (2010) discusses the remarkable success of *An Inconvenient Truth* in doing what other documentaries were not able to, i.e. to take an issue generally perceived as an activist concern and make millions of Americans ready to act. The author considers *An Inconvenient Truth* as an example of the art of persuasion, “from Gore’s winning sense of humour [...] to its blurring of genre and deployment of Aristotelian modes of reasoning” (Minster, 2010: 26). According to Minster, the success of such production is due to the fact that audiences are persuaded to action “not by facts or prophecies of doom [or] by abstract calculations” but rather “by likeable characters we can trust and maybe even emulate [...], by humour and believable emotions, and by shared values and deeply embedded cultural narratives” (Minster, 2010: 26). Despite the discussion on documentary films, Minster introduces the importance of ‘engaging and likeable characters’, which are the driving force of any fictional narratives. Following such claims, one is left to wonder: compared to still images and factual reports, could fiction films help improve the communication of climate change issues? In the three empirical chapters of this thesis I will refer to some of the points raised by the above studies when analysing the choices made by the screenwriter and scientist during the script development process.

Climate fiction films and speculative scenarios

Perhaps the most comprehensive work on cli-fi films to date is Svoboda's (2016) analysis of the content of 60 climate change fictional films from 1984 to 2015, including major cinema releases, smaller festival films, and made for television movies. Reviewed for “their unifying characteristics and distinguish differences” (Svoboda, 2016: 44), the sample intentionally excludes documentary and advocacy films and episodic TV programmes. A table provided in

the paper categorises these films according to the year of release (from 1984 to 2015) and by the ‘climate impacts’ depicted in the film: (1) floods/sea-level rise, (2) extreme weather, (3) into/in Ice Age, (4) melting poles, (5) famine/drought, (6) problema(c)tic/stress disorder and (7) antagonist. The first category includes films that address ‘local, regional, or global inundation’ such as *Waterworld* (1995), *Lost City Raiders* (2008), *Noah* (2013), *The Flood* (2007), and *Beasts of the Southern Wild* (2013). The second category, ‘extreme weather’, appears to be the largest subset of cli-fi films reviewed in the paper (40% of the total) and includes films such as *Twister* (1996), *The Storm* (2010), *Sharknado* (2013, 2014, 2015) and *Into the Storm* (2014) (Svoboda, 2016: 46).

According to Svoboda, films from the ‘extreme-weather category’ also fall in the third group, ‘into/in Ice Age’. In particular, this is the case of *The Day After Tomorrow*. Despite the significant role that this film has played in the communication of climate change, Svoboda recommends “that researches in the humanities and social sciences look beyond *The Day After Tomorrow*, which has received far more attention than any other film” (Svoboda, 2016: 43). Leaving the ‘into/in Ice Age category’, the author moves the analysis to the ‘melting poles category’, which includes films such as *The Last Winter* (2006) and animated features such as *Ice Age: The Meltdown* (2006) and *Happy Feet 2* (2011). Svoboda’s fourth category sees the issue of ‘famine/drought’ at the centre of the narrative with films such as *The Road* (2009), *The Rover* (2014) and two major Hollywood movies: *Mad Max: Fury Road* (2015) and *Interstellar* (2014). Whereas the former feature a prevalence of desert conditions, the latter depicts an environmental disaster that has led to a slow withering of the food crops. The sixth sub-group, ‘Problema(c)tic Stress Disorder’, which features films such as *Take Shelter* (2001), refers to narratives that deal with psychology, “specifically on how the environment figures in the stress of modern life, especially for those who lives are already troubled” (Svoboda, 2016: 51). The seventh and last sub-group, the ‘antagonists’, is the most controversial category as any film, to a greater or lesser degree, would indeed feature climate change as the antagonist. However, the ‘antagonists’ category, which includes box-office successes such as *Kingsman* (2015), is based on films that narrate a threat to the Earth that is ‘human’ rather than a ‘natural’, in other words a threat that is man-made. Svoboda reminds the reader that films such as *Mad Max: Fury road* (2015), *Interstellar* (2014) and *Kingsman* (2015) do not explicitly engage with climate change but have come to be associated with it due to different narrative elements (Svoboda, 2016: 59). While Svoboda does not specifically unpack these elements in the paper, in chapter 3 I will further discuss the nature of *Interstellar* as a cli-fi film.

While Svoboda provides a categorisation of cli-fi films, other studies in ecocinema examine the narrative of certain cli-fi films more in depth. Although most of these studies seem to prioritise *The Day After Tomorrow*, this literature review also found *Take Shelter* and *The Road* to be a focus of attention in academic research. First, Salvador and Norton (2011) analyse the narrative of *The Day After Tomorrow* as a variation of apocalyptic discourse identified as a *flood myth*. According to the author, such narrative “largely undermines contemporary environmental discourse that attempts to generate public activism in addressing ecological problems” (Salvador and Norton, 2011: 45). The reason for this statement is further explained through an analysis of the *apocalyptic* and the *jeremiad narrative*, both well established in rhetorical and environmental studies, which seem to be a common pattern in most of the films associated with climate change. The apocalyptic rhetoric focuses on the idea of a looming catastrophe that threatens all humankind, but we can find several versions of this through history. For example, “in Christian versions, the apocalypse – Armageddon – is inevitable and welcomed, [...] whereas the secular apocalyptic narrative leaves open the possibility for human intervention to avoid the potential catastrophe” (Salvador and Norton, 2011: 47). Closely related to the apocalyptic discourse is the jeremiad narrative that dates back to Puritan sermons of the 1600s (early versions were linked to biblical scriptures). The structure of the jeremiad includes four key elements: “(1) a chosen people has failed to keep covenant with key value or principles, (2) the people will suffer calamity as a result of this misbehaviour, (3) such calamity will be avoided by a return to specified righteous action, and (4) through proper action the chosen people shall recapture their favoured status and avoid ruin” (Salvador and Norton, 2011: 48).

The apocalyptic and jeremiad narratives consider human agency as “both subject to the power of nature and effectual at intervening in nature.” (Salvador and Norton, 2011: 49). Associated with the flood myth, the authors argue that the apocalyptic scenario in *The Day After Tomorrow* might significantly decrease the chances to generate effective responses to the problem of global climate change. Contemporary flood myths, as constructed in this film, combine both ancient and biblical elements in organising a symbolic response to contemporary concerns over global climate change (Salvador and Norton, 2011: 50). Despite the several reasons that led to the flood, the basic flood mythic structure consists of five key points in all the versions: (1) humans live in fundamental opposition to the laws of God or nature, and ignore warnings of potential catastrophe; (2) select individuals listen to warnings and take action to survive; (3) the storm sweeps across the land, destroying both the physical and social structures of the human kind; (4) social order is recognised in line with the laws of God/nature;

and (5) the Earth is purified” (Salvador and Norton, 2011: 50). But these structures, according to the authors tend to undermine the concept of human agency. In a narrative such as *The Day After Tomorrow* “all answers are known, responsibility is clearly assigned, and there is little left to do but wait for and survive the purification brought by nature’s retribution” (Salvador and Norton, 2011: 60).

Other cli-fi films such as *Take Shelter* (Nichols, 2011), *The Happening* (Shyamalan, 2008), and *The Road* (Hillcoat, 2009), all set in catastrophic features, are analysed by Kaplan (2015) to discuss the prevalence of apocalyptic scenarios in Western stories and the concept of ‘Pre-Traumatic Stress Syndrome’ (PreTSS) in relation to climate change. While ‘Post-Traumatic Stress Syndrome’ (PTSS) relates to the aftermath of an event, PreTSS relates to events yet to unfold and it can be observed in several post-9/11 cinema productions. According to Kaplan, Nichol’s *Take Shelter* perfectly encapsulates this phenomenon. In the film, the pre-trauma comes in the form of the protagonist Curtis LaForche’s fantasies/hallucinations of a catastrophic climate event, which threatens to rob him of his family and his job. Curtis’ life is indeed brought to the brink of ruin due to signs of PreTSS, that visually translate in violent dreams, signs of depression and paranoia. However, Kaplan does not only consider the ways in which pre-trauma is embodied in works of cinema, but she also relates to a discourse on spectatorship. According to the author, through identification, the viewers of the apocalyptic/dystopian genre come to engage with their future selves and are situated within the texts as so-called “virtual future humans”. As a consequence, the distribution of such futurist disaster narratives can trigger pre-traumatic stress in audiences individually and at a broader cultural level (Kaplan, 2015: 2-3).

A textual analysis of *Take Shelter* (2011) by Woolley (2014) investigates its narrative strategies and claims that the relationship between metaphors and materiality in this film represents “an innovative approach to climate change and the imaginative challenges it poses” (Woolley, 2014: 187). According to the author, *Take Shelter* stands out for abandoning the Hollywood narrative conventions of the disaster genre and dramatizes the environmental crises by suggesting “alternative ways of knowing our environment to the empirical modes within the contemporary discourses that climate change tend to operate” (Woolley, 2014: 176). Through an analysis of the key plot points and climaxes of three Acts, Woolley examines how this film subverts the conventions of the environmental disaster by leaving the spectator in doubt at all times regarding the nature of the protagonist’s dreams. Specifically, the viewer is left to wonder whether these dreams are the manifestations of Curtis’ psychological turmoil or an accurate prediction of a coming catastrophe. Affected by what it seems to be schizophrenia,

Curtis is trapped in a family and community who struggles to believe his visions of an impending storm. At every stage, the audience is left to wonder: is Curtis as a prophet or a sick man? As accurate premonitions of an imminent apocalypse, “Curtis’ dreams transform the film from realist psychological drama to super-natural thriller” (Wolley, 2014: 188). Compare to the conventional Hollywood story, *Take Shelter* does not present the picture of a close family united against the disaster but rather a community that is struggling to come together. The film ends without suggesting any family safety and leave us wonder if the family is going to survive or not. The paper suggests that the film’s ability to challenge the Hollywood conventions “by depicting rationality as the source of irrational behaviour” (Wolley, 2014: 187), and the decision of rejecting a neat resolution, makes this film a great example of alternative narrative for audience engagement and a new way for experiencing fears and anxiety related to climate change.

The film *The Road* also features next to *Take Shelter* as an icon of apocalyptic climate change films. Mcsweeney (2013) analyses *The Road* (Hillcoat, 2009) in comparison to the original novel by McCarthy (2006) and discusses some of the criticisms about this adaptation. According to the author, the film depicts the future consequences of climate change including the possible extinction of the human race and through a tragic narrative. Like other apocalyptic and dystopian films, in *The Road* the environment is portrayed as a devastated eco-system where the sun is blocked out by ashes and all animals have died. The remaining humans are left to scavenge for the few remaining resources, living off of diminishing supplies of tinned food they find in abandoned buildings. In this film, “there is little hope left for the human race because when the rest of the food is gone, humans too will disappear, leaving behind only crumbling buildings like markers on a grave” (Mcsweeney, 2013: 45). However, in the case of *The Road*, the filmmakers wanted to distance themselves from some of the clichés of the apocalyptic genre in terms of production choices. For example, opposed to films such as *Mad Max*, “which are about high concept of spectacle and are filmed in expansive and expensive studio sets”, the filming of *The Road* “took place primarily in abandoned coal fields, mines, freeways, city blocks, bridges under construction, and an amusement park destroyed by fire” (Mcsweeney, 2013: 46). To heighten its realism, the director also integrated his footage with original images of affected landscapes. For example, one particularly powerful image of a pair of ships marooned on a freeway, seemingly miles from the coast, was originally filmed in New Orleans in the after-math of Hurricane Katrina (Mcsweeney, 2013: 46). In an interview, the director Hillcoat stated that there is no need to create further sets when there is already a big amount of devastation on the American landscape to be used for filming.

Mcsweeney also discusses the marketing of the film. When the first trailer came out people feared that the book, slowly paced, “sombre and elegiac”, could have been transformed into an action movie. The trailer, which features footage of typhoons, floods, and volcano eruptions, left people to speculate on the changing nature of the story from the initial novel and a different dramatization (Mcsweeney, 2013: 43). The sceptical approach to the film, the negative reviews after its release in cinemas, and the small box office return (only £15 million worldwide compared to the 118£ for films such as the *Book of Eli* (2010)) may suggest that in the end this narrative did not have the same impact on the audience as expected by the producers, despite the appeal of the genre. However, the author argues that *The Road* is rich of symbolism and the audience can find several metaphors for real catastrophic events. For example, images of the father, clad in grimy clothes, pushing an old shopping cart full of their meagre possessions through the lifeless landscape, is “an image pregnant with connections to Hurricane Katrina and cannot help but resonate with the implicit criticism of materialism and consumerism”, a criticism that pervades both the film and the original book (Mcsweeney, 2013: 47). The physical journey of the protagonists in the film, is also the manifestation of an internal emotional and spiritual journey in the hope of reaching a destination near the sea where they could perhaps find some remains of civilizations. The recurring flashbacks in the film make the protagonist’s memories feel more like haunted dreams, “haunted by both the father’s own ghosts and the ghosts of a collective American past” (Mcsweeney, 2013: 48). Through further analyses of sequences that emphasise how for the characters everything has been lost, the author concludes that, contrary to the typical ending of the sci-fi narrative where human race is left with the opportunity of a fresh start, *The Road* “offers no such easy resolution or formulaic opportunities for redemption” (Mcsweeney, 2013: 55).

What all these films have in common is the portrayal of speculative scenarios. According to Kirby (2013), in the context of cinematic science, events in the narrative can be divided into two categories: speculative scenarios and fantastic science. While speculative scenarios have the potential of occurring in the real world, even if improbable or based in a distant future, fantastic science represents impossible scenarios. For example, “no matter how much knowledge we gain or engineering skills we develop, the mind-control scenario Daniel Kubat constructed for *The Stepford Wives* (2004) will never come into existence” (Kirby, 2013: 147). Therefore, the challenge of working on fantastic science is to develop a case for how something could happen, rather than figuring out how something did happen (Kirby, 2013: 162). On the other hand, speculative scenarios go beyond the creation of future technology for the story; they include “comprehensive storylines that may even form the basis for the entire

plot - like restarting the sun in [the films] *Solar Crisis* and *Sunshine*” (Kirby, 2013: 152). Thus, compared to fantastic science, scientific speculative scenarios in cinema can play a role in knowledge generation (Kirby, 2013: 233).

Speculative fiction is a film and literary concept that is intrinsically linked to any work of fiction that deals with science. Historically, the term is associated to three meanings: “a subgenre of science fiction that deals with human rather than technological problems, a genre distinct from and opposite to science fiction in its exclusive focus on possible futures, and a super category for all genres that deliberately depart from imitating ‘consensus reality’ of everyday experience” (Oziewicz, 2017: 1). However, in all of the above cases, speculative fiction can be considered “a reaction of human creative imagination struggling to envision a possible future at the time of a major transition from local to global humanity” (Oziewicz, 2017: 2). For instance, Margaret Atwood, an icon of speculative fiction, explains the association of her book *The Handmaid’s Tale* (1998) with this genre as the story she tells “takes situations that actually exists to their logical conclusion if the cultural and political momentum of contemporary times continues on its trajectory (Keifer-Boyd and Smith-Shank, 2006: 139). As a matter of fact, the definition of speculative fiction as a narrative that seek to map out a possible future has often been applied to late 19th- and early 20th-century utopias, “most of which were concerned with social and political—rather than technological—speculation” (Oziewicz, 2017: 5). By referring to the literary tradition, speculative fiction highlights a human rather than technological problem as this genre is concerned “not so much with science or technology as with human actions in response to a new situation created by science or technology” (Oziewicz, 2017: 4).

However, rather than looking for a conclusive definition, one could benefit more by considering ‘speculative fiction’ as a term in continue expansion and evolution since it was coined as a name for a genre in the 1940s (Oziewicz, 2017). Currently, ‘speculative fiction’ reflects and connects several established and emerging film and literary traditions and its cultural shifts are due to an accelerating genre hybridization that is diving a field previous mapped with a few broader categories (Oziewicz, 2017: 3). These categories include, but are not limited to, utopia, dystopia, horror, the gothic, cyberpunk, time slip, magic(al) realism, supernatural romance, weird fiction, (post)apocalyptic fiction, etc. (Oziewicz, 2017: 6). More recently, in the the 21st century, a new genre of Anglophone fiction came to become part of speculative fiction —the climate change novel, often abbreviated as “cli-fi.” Many successful authors of literary fiction, such as Margaret Atwood, [...] have contributed to this new genre’s efforts to imagine the causes, effects, and feeling of glob al warming (Irr, 2017: 1). As we as

seen, this genre has also become extremely popular through television and film productions, providing depictions of “the effects of a dramatic change in the Earth’s climate on a particular location and a vision of the options available to a population seeking to adapt to or mitigate those effects” (Irr, 2017: 1). The exact origins of the term “cli-fi” are obscure, but the journalist Dan Bloom has certainly played a crucial role in its history, as is documented by his website, *The Cli-Fi Report* (Irr, 2017: 2). In his study *Anthropocene Fictions: The Novel in a Time of Climate Change* (2015), Adam Trexler documents how reviewers began referring to the term cli-fi regularly from the 2000s and how by 2013 the term had achieved prominence through several newspaper accounts. Cli-fi narratives can be set in the past, present or near future and frequently they are characterised by efforts to imagine the effects of climate change on human life and on our perceptions of the environment.

There are a wide range of styles and voices used in cli-fi stories, but these works often pay marked attention to the perspectives of scientists, especially where these deviate from popular ideas about the environment (Irr, 2017). Interestingly, a group of scholars argue that one way to identify a film genre can be by studying the position of the scientist as a character in the story, which in turn will affect the message in the film (Svoboda, 2016: 56). While in the disaster film the scientist as a character is used as a ‘trusted’ messenger to explain the science and to warn the protagonists about the future dangers, in apocalyptic films there is still one scientist left but it is too late for the science to find a solution - as the environment has already taken care of solving the problem by killing the majority of the population (Hammond and Breton, 2014). In the dystopic film instead, as in the case of *The Road*, the figure of the scientist seems to dissolve, families are broken and individuals, due to the circumstances, are forced to connect with other members of a destroyed community who may be ready to share the risks in order to survive (Svoboda, 2016: 56). A characteristic of the disaster genre, compared to the dystopian and apocalyptic genre, is also that the narrative usually provides a positive ending for its protagonists (Murphy, 2014).

Common locations for cli-fi films are endangered cities, islands, and remote Arctic regions, and the disasters in these narratives often turn on a dramatic transformation in the setting through events such as floods or the collapse of the food system. The pacing of these stories tends to be accelerated and punctuated by crisis that “create an anxious, fearful mood and a preoccupation with the instability of objects” while enhancing the development of “an apocalyptic sensibility [...] and patterns of guilt, crisis, and salvation”, which have been an important source of controversy surrounding the genre (Irr, 2017: 3). As a matter of fact, discussions surrounding cli-fi have often provoked an inquiry and criticism into the genre’s

depiction of a future that will see the destruction of the human species or the planet as a whole. Moreover, the near-future, post-apocalyptic scenarios so prevalent in the genre often assume that the turning point for change occurred before our own historical moment, and consequently they frequently rely on archaic images, such as the drowned city (Irr, 2017: 6). Thus, “cli-fi is consistently concerned with a temporality that is retrospective, looking back to a change that has already begun to occur and to which humans and other species must adapt” (Irr, 2017: 7). To conclude, cli-fi rarely allow the protagonists a chance to mitigate the impacts of the climate events on their environment, let alone alter the conditions for their occurrence - as in time travel narratives (Irr, 2017: 7). Nonetheless, as the next chapters will discuss, an attempt to mitigation and solutions can be seen in narratives such as *Interstellar* and my short film, *Be Tradition*, which carry several of the feature of the cli-fi genre.

Conclusion

This literature review highlighted the central debates around script development and the production of science and climate fiction films to help the reader understand different underpinning approaches to this research on the collaboration of scientists and filmmakers at the script development stage. While screenwriting used to concentrate on the analysis of individual scripts and the work of the screenwriter alone, in the past few years there has been a growing recognition of the importance of looking at the development of screenwork in full in order to analyse the script development process. Moreover, Batty (2017) remarks what most of the definitions of script development have in common is the element of collaboration. However, script development can vary according to the specific production and this makes the process hard to define (Taylor and Batty, 2016). To explain the wider notion of script development this review has privileged Macdonald’s use of the term ‘screen idea’ as a means to help focus the discussion on scripting as a record of the ‘shared screen idea’ (Mcdonald, 2004).

Collaboration is also the property of science film productions where the film is developed with the support of the science consultant. Kirby’s research argues that scholarship in film production has mainly focused on the role of the scientist and scientific organisations during the making of the film, but scholars still need to uncover how screenwriters approach the writing of science and how/why filmmakers produce filmic images of science (Kirby, 2014). The making of science fiction films in collaboration with science experts reveal tensions not only between the narrative forms of media and those of science, but also between the needs

of the entertainment industry and those of the scientific community (Kirby, 2014). Nonetheless, both the entertainment industry and the scientific community benefit from this collaboration: while the former gains from the scientist's work in adding plausibility and 'visual splendour' to the audience's enjoyment, the latter can profit from promoting research agendas, stimulate technological development, and even encourage political action (Kirby, 2013; 2014).

Another set of research discusses the problematic use of *accuracy* as a criterion for the analysis and assessment of climate change films and proposes that scholars should rather use criteria such as teachability, integrity and credibility (Mellor, 2009; Ramirez-Galindo, 2016; Manzo, 2017). Moreover, the discrepancy between filmmakers and scientists' approaches and views in the production of a film leads to different interpretation of the term *accuracy*. For this reason, Kirby (2014) proposes that *authenticity* serves as a better concept to approach the analysis of science in a fictional film. If *accuracy* and *certainty* in climate change factual and fictional films are an issue, then the audience should be reminded that uncertainty in science is normal and discourses on editing should not lead to the assumption that this stage represents a manipulation of the truth, but rather look at it as an essential step in every film production (Manzo, 2017).

A collection of studies in cognitive psychology argue that, compared to more expository forms of communication, fiction films can captivate the audience through properties such as transportation and identification (Green & Brock, 2000; Slater and Rouner, 2002; Moyer-Guse', 2008). As the viewers are swept into the fictional story they are also less keen or less motivated to counter-argue story points which makes fiction a useful means for the communication of climate change issues. If considering science fiction in particular, when the scientific experts' explanatory skills, culture of objectivity, and logical methodology are matched with the filmmakers' narrative abilities, this combination can contribute a great deal to an audience's willing suspension of disbeliefs (Kirby, 2013). However, identification and transportation depend on multiple factors such as the quality of the film, the format, the style and the genre. Research in ecocinema also highlights that in case of climate change films, trust in the filmmaker and the film contributors is pivotal for effective communication. Moreover, the success of climate change films in persuading the audience can also be due to likeable characters and our relation to the characters' wants, needs and dramatic goals (Minster, 2010; Catrysse, 2010; Finnegan, 2016).

Research on the impact of films such as *The Day After Tomorrow* on the audience provides different results according to the audience under scrutiny, but most of the study agree

that the film inspired its viewers to search for further information about climate change afterwards (Leiserowitz, 2004; Lowe et al, 2006). Nonetheless, scholars recommend that researchers of climate change communication look beyond *The Day After Tomorrow*, which has received far more attention than other cli-fi films (Svoboda, 2016). Svoboda's (2016) comprehensive analysis of different categories of cli-fi films productions up to 2015 reveals that the 'extreme weather' is the largest subset followed by 'floods/sea-level rise' and 'into the ice age' cli-fi(s). Scholars also remark that most of these films tend to adopt an apocalyptic scenario for the depiction of climate change (Salvador and Norton, 2011) and that the use of the disaster genre/scenario remains the favourite amongst the cli-fi film productions (Svoboda, 2016). Despite the focus on *The Day After Tomorrow*, ecocinema studies also refer to films such as *Take Shelter* (2011) and *The Road* (2009) as productions that stand out for abandoning the Hollywood narrative conventions of the disaster genre and dramatize climate change with alternative narratives (Woolley, 2014; Mcsweeney, 2013).

What all these films have in common is the portrayal of speculative scenarios, and the review concludes with providing a definition of speculative fiction and one of its the most recent subgenre, the cli-fi. Speculative fiction is a film and literary concept that is intrinsically linked to any work of fiction that deals with science, but the term cli-fi was adopted in the early 2000s in order to refer more specifically to narratives that are characterised by efforts to imagine the effects of climate change on human life and on our perceptions of the environment. There are a wide range of styles and voices used in cli-fi stories, but these works often pay marked attention to the perspectives of scientists, especially where these deviate from popular ideas about the environment (Irr, 2017). Discussions surrounding cli-fi have often provoked an inquiry and criticism into the genre's depiction of a future that will see the destruction of the human species or the planet as a whole. Cli-fi rarely allow the protagonists a chance to mitigate the impacts of the climate events on their environment, let alone alter the conditions for their occurrence (Irr, 2017: 7).

Following concepts, theories and scholarship debates provided by this literature review, in the next chapter I analyse the making of *Interstellar* (2014), with a specific focus on the script development process. This case study will illustrate the collaborative construction of *Interstellar* as a science fiction narrative and will discuss how the writers and producers negotiated the science that led this film to fall in the cli-fi category by referring to the personal experience and expert opinion of the parties involved in this production.

CHAPTER 3

Making the Hollywood Cli-fi: the collaboration between scientist, screenwriter and director in the development of *Interstellar*

“The movie *Interstellar* deals with physics that is well understood, well established, deals with physics where we make educated guesses, almost sure but not 100% sure of our guesses. Deals with physics at the frontiers of human understanding where we have to speculate and, when you get beyond those frontiers, *Interstellar* works hard to align itself with the best speculations that scientists could imagine.”

(Kip Thorne, *The Science Behind Interstellar*: min 20.00)

“We are struggling very hard as filmmakers to try and explain these scientific concepts, these abstract ideas, in a subjective way, in a way that you actually experience and feel something about.”

(Christopher Nolan, *The Science Behind Interstellar*: min 27.47)

Introduction

While the film industry certainly provides numerous examples of scientists consulting on sci-fi productions (Kirby 2013), the making of *Interstellar* (Nolan, 2014) represents a useful case study to observe: 1) the role of the science expert as an active player in the script development process of a cli-fi, from the idea generation to the editing stage; 2) how the embedding of the science can shape this process; 3) the dynamics and constraints of the collaboration between the scientist and the screenwriter/filmmaker. Categorised as a ‘drought/famine’ climate fiction film (Svoboda, 2016), *Interstellar* stands out among other productions for the role of Professor Kip Thorne, Nobel Prize physicist at the California Institute of Technology, who first developed a story about intergalactic travels, wormholes and gravitational waves and pitched it to Hollywood industry. Directed by Christopher Nolan and written by Jonathan Nolan in collaboration with the physicist, *Interstellar* has been described as one of the most iconic cli-fi of our time. As this chapter will later discuss, the cli-fi label was assigned to *Interstellar* by critics based on the environmental disaster that leads the protagonist to abandon a dying Earth on a mission to find a new home for humanity in a distant galaxy.

Since the release of the film in the cinemas in 2014, several news articles and specialised magazines have identified *Interstellar* as an important contributor to the climate change discourse. For *The Guardian* (Shoard, October 29, 2014), the post-climate change perspective of *Interstellar*, which “shows a world decimated by man-made agricultural blight”, led many people to re-evaluate the seriousness and reality of climate change. For *Yale Climate Connections* (Svoboda, November 11, 2014), “Nolan’s evocative depiction of a new dust bowl offers evidence of adverse climate change” but the overall film “fails the test of being a serious cli-fi”. Despite repeatedly highlighting the pedagogical strength of science in *Interstellar*, the writer of this article reprimands Nolan for writing a narrative that “accuses nature of neglect, if not outright abuse”. In the film, humanity is forced to go to space in order to survive as “the Earth is no longer a reliable provider” and this would make *Interstellar* a controversial narrative of environmentalism.

On the other hand, in the *Greenpeace*’s article *No, Interstellar doesn’t mention climate change but it could still do the problem a lot of good* (Johnson, November 12, 2014), the journalist claims that despite the lack of direct reference to climate change, *Interstellar* has the potential to play a positive role in the climate movement and encourage the public to take activist action. In 2015, *New Republic* magazine (Kollmorgen, April 22, 2015) ranked *Interstellar* among pioneer climate change films such as *An Inconvenient Truth* and *The Day*

After Tomorrow. Similarly, in a post from the 1st of June 2018, Al Gore's *Climate Reality Project* website, listed *Interstellar* as one of "the 6 must-see movies about climate change", proving that four years after its debut in cinema the film still held its value as a contributor to the climate change discourse. Considered by *Climate Reality* as deeply engaging and thought-provoking, in one of their editorial the climate change activists argue that *Interstellar* can shine a light not only on the realities of the climate crisis today but also for our tomorrow.

To summarise the story in a synopsis, *Interstellar* tells the journey of Cooper, a former NASA pilot and engineer who runs a struggling farm with his father-in-law Donald, his son Tom, and his daughter Murph. It's the mid 21st century and crop blights and dust storms threaten humanity's survival. Murph believes that a ghost inhabits the house and that it is trying to communicate with her. Cooper believes that these signs are gravitational variations and after greater study, the messages translate into geographic coordinates. Cooper and Murph follow these coordinates to an old NASA facility where they meet Professor John Brand, who operates the remnants of NASA. He explains that 48 years ago a wormhole opened near Saturn and that three astronauts were sent to investigate in the hope of finding a habitable planet for mankind. In the years since, NASA developed two plans to save the human race – one involves the mass relocation of humankind, but this is being halted by their failure to solve a gravitational propulsion theory. The second plan is for Cooper to pilot a spacecraft called *The Endurance* and carry human embryos through the wormhole to a habitable planet on the other side. Murph doesn't want her father to abandon his family and the farm but in the end Cooper decides to join the mission for the greater good.

Cooper and his crew enter the wormhole and investigate the first of three potential worlds. It is an ocean world and time is severely dilated due to gravitational fields. After a brief window of exploration, they are forced to leave as a cataclysmic tidal wave approaches them. One of the crew is lost, and by the time they return to *The Endurance*, over 23 years has elapsed. Cooper catches up on two decades worth of video diaries from his children and is heartbroken as he watches them grow. Murph has never forgiven her father for leaving and she now works with an ageing Brand to try and solve his gravitational propulsion theory in the event that *The Endurance* is unable to save them.

Afterwards, the remaining crew debate where to go next. They have only fuel for one more trip and decide to visit the planet that is still broadcasting the original astronauts' signal. They go to the planet and find the surviving astronaut, Mann. He tries to kill Cooper in a desperate bid to abandon the mission and return to earth. He flies to *The Endurance* but is killed. Cooper and the crew perform a difficult docking manoeuvre and board *The Endurance*

in time. With only minimal fuel, Cooper decides to slingshot around the planet, which will cost them 51 years in time. In doing so, he jettisons part of the craft so that the remaining crew can travel to the final remaining planet, while Cooper travels into a black hole. In the black hole, Cooper experiences a warp in time and space and is able to communicate to a young Murph in the farmhouse. Meanwhile, an adult Murph returning to the farmhouse to help her stubborn brother and his ailing family leave their home in the midst of another dust storm, realises that the ghost she ‘saw’ as a child was her father communicating from another part of the Universe. She is able to use this information to perfect the gravitational propulsion theory and save mankind.

In the end, Cooper wakes on a space habitat orbiting Saturn. Many years have passed, and mankind has been saved. He is brought to his daughter, Murph, who is now an elderly woman nearing death. He reunites with her and they make peace before her family join her in her final moments. Murph tells him to go and find his crew so Cooper boards a spacecraft to the remaining habitable planet where they await his arrival.

Whilst this chapter focuses on the creation of the environmental-disaster aspects in *Interstellar*, some of the aforementioned plot points will be also considered to analyse the collaborative script development process and how this was affected by the incorporation of the science in the narrative. This portion of the research is guided by the results of an interview that I conducted with Thorne in February 2018 (appendix A), when I asked the scientist for a personal account of his experience while working on *Interstellar* as creator/writer and executive producer. Some of the data was also gathered from the book *The Science of Interstellar* (Thorne, 2014). While the book discloses pivotal information regarding the production, most of it is dedicated to the astrophysical science that inspired this film and that led Thorne to win the Nobel Prize. An interview with Thorne was then necessary to generate a conversation on the making of *Interstellar* specifically as a cli-fi film and to further explore the development of Act 1, where most of the information about the environmental issues in ‘Cooper’s world’ are communicated. For this case study, it was not possible to obtain a direct testimony from either Christopher or Johnathan Nolan about the experience of working in collaboration with Thorne during this production. Nonetheless, in order to understand their perspectives and experience of the script development process for *Interstellar*, I analysed some relevant quotes from an interview by Jordan Goldberg, editor at *Faber and Faber*, which was used as the foreword in the published screenplay (Nolan and Nolan, 2014).

Embedding the science in early-stage development

As this study concentrates on an analysis of the script development process, my first question to Thorne was about the generation of the idea for the film and the writing of the treatment - a semi-dramatized, present tense, prose summary that allows a preliminary structuring of the screenplay. Although some screenwriters feel that such document can “undermine the creative energy of the potential screenplay” (Parker, 1999: 45), the treatment is a valuable development document used in the earliest stages of the writing process, allowing the screenwriter to easily navigate structure, characterisation, active questions and many other screenwriting concepts on a manageable scale. For many screenwriters the treatment might be the last document they write, a pitch document to send out to prospective agencies or producers, with the purpose of getting a reader to either commission a script or read a full draft (Batty and Waldeback, 2019: 6). In both cases, treatments can be considered an essential part of the script development process.

In answering my first question, Thorne immediately clarified that the climate change/environmental aspect of the story that I was interested in was to be attributed to Jonathan Nolan and was not there when the treatment was first developed (Thorne, appendix A). This does not exclude Thorne’s involvement in the embedding of the science for that portion of the film, but it was Jonathan Nolan who decided to incorporate that particular feature when he joined the production. In the interview, Thorne explained that the development of this film began in 1979 when the astrophysicist Carl Sagan introduced Thorne to Linda Obst, a movie producer who was just beginning her career in Hollywood. Obst is one of the major female producers in Hollywood, known for successful movie productions such as *Flashdance* (Lyne, 1983), *The Fisher King* (Gilliam, 1991), *Contact* (Zemeckis, 1997), *How to Lose a Guy in 10 Days* (Petrie, 2003) and *The Invention of Lying* (Gervais and Robinson, 2009). This important friendship between Thorne and Obst led to the beginning of this unique project in 2005. At the end of that year, Obst approached Thorne with an idea for a sci-fi and sked him to help her develop this initial idea further. According to Thorne, him and Obst spent the next four months “brainstorming a movie” through phone calls and emails (Thorne, appendix A). At this stage, Thorne’s formulation of the film was based mainly on the science he studied and included story elements such as “human encounters with higher-dimensional creatures” (Thorne, 2014: 2).

In February 2006, Obst had a meeting with the director Steven Spielberg’s agent, Todd Feldman, who was immediately interested in the project and reported back to Spielberg.

Steven telephoned her and asked if she could have a treatment on his desk by the end of the day. She said: ‘no, but I’ll get you one by tomorrow’. So, she threw something together based on our email exchanges and our conversations, which was eight pages long, and she sent it to him. (Thorne, appendix A)

A few days later Spielberg responded that he would be very keen on making this movie and asked to meet with Thorne and Obst. However, before any meeting had happened, a week later Obst informed Thorne that Spielberg is ready to sign on to direct *Interstellar*. In March 2006, the three have their official first meeting to discuss how they should move forward with the development of the story and the script. In that occasion, Thorne decides to establish some guidelines in regard to the embedding of the science in the narrative:

1. Nothing in the film will violate firmly established laws of physics, or our firmly established knowledge of the universe.
2. Speculations (often wild) about ill-understood physical laws and the universe will spring from real science, from ideas that at least some “respectable” scientists regard as possible. (Thorne, 2014: 4)

With Spielberg on board, in June 2006 Obst and Thorne organised a first workshop at the California Institute of Technology (Caltech) where fourteen scientists were invited to discuss scientific concepts to be included in the film. According to Thorne, to organise workshops with scientists in a pre-production stage “is something that Lynda Obst has generally done with [all] her science related movies” (Thorne, appendix A). Consultations with experts is common practice in the commercial industry, where funds are available to invite outsider parties to contribute to the generation of the screen idea (Macdonald, 2013) and this practice can be likened to the formation of a writers’ room in a television production, where daily brainstorming sessions help ‘break’ the story and shape the production to come. Like a writers’ room, the workshop, which lasted for eight hours, provided them with new ideas, suggestions and objections that functioned as stimuli to revise the initial short version of the treatment. After six months, in January 2007, Thorne and Obst developed a new treatment that, according to Thorne, “came to be forty pages and about twenty-five percent of it was the science – so, a lot of the science was integrated at this stage” (Thorne, appendix A). It should be noted at this stage that a 40-page treatment is considered to be quite excessive in length, with a typical treatment for a feature-length film ranging from five to ten pages. Therefore, the document

presented to Spielberg was a little different from the typical screenplay treatment, in that a significant amount of the writing was about the science studied by Thorne.

This initial stage in the development of the story and the script reveals some important aspects of this collaborative process. First, despite Thorne being a leading expert in his field of study, he and the producers sought the approval and opinions from the wider scientific community, a sign of the commitment in securing a high level of scientific authenticity in the film. Second, it took almost two years from the generation of the idea to the presentation of a treatment, before any screenwriters was even involved. This shows that the development of script began prior to the what we would consider the official screenwriting stage and the scientist was an integral part of this process. Generally, the role of the science consultant in Hollywood film productions is to provide the filmmakers with “a scenario that could be defended as plausible and one that allowed them to create drama through the visualisation of extraordinary events” (Kirby, 2013: 159). But in the case of *Interstellar* it is difficult to see Thorne simply as a consultant: we are observing a scientist pitching an original idea for a fiction film to a filmmaker in collaboration with a producer. It is not a situation where a screenplay was written, and the scientist was hired in order to include accurate science for entertainment purposes. From this perspective, the pre-production stage of *Interstellar* stands out as a unique case of collaboration between the film industry and the scientific community.

When asked about the challenges of developing the treatment while incorporating the science, Thorne replied that there was never any particular struggle with the development at this stage as him and Obst were in mutual agreement on what *Interstellar* should be and what information should be included in this document.

You have to understand that Lynda and I had dated for about 2 or 3 years. I married someone else, but we remained very good friends. She’s a close social friend of me and my wife, so these were close friends deciding to do something together. She was a science editor for the *New York Times* magazine before she came to Hollywood and so she understands a lot of science and she has interacted with scientists. She was a foreign language producer for Carl Sagan’s *Cosmos* television series - much of her social and intellectual life has been in contact with scientists. So, from that point of view the foundation was there for it to be an easy and enjoyable collaboration. (Thorne, appendix A)

Despite the smooth collaboration with the producer as a writing partner at this early stage, possibly facilitated by the nature of their personal relationship, Thorne and Obst had to go through several drafts of the treatment before this could be passed on to a screenwriter. Obst and Spielberg interviewed candidates for this job close to a year and during the first half of

2007, Jonathan Nolan, who at that time was thirty-one-year-old, was chosen. By that point in his career, Nolan had co-authored two screenplays with his brother Christopher, *The Prestige* (2006) and *The Dark Knight* (2008). In his book, Thorne remembers Nolan as having “little knowledge of science, but he was brilliant and curious and eager to learn” (Thorne, 2014: 5).

As a first step, before he [Jonathan] started work on the treatment, we met and had long discussions and we agreed that I would feed him things to read that were relevant. And so, for several months, something like three months, he spent a large portion of his time reading science books, semi-popular science books about the science that was relevant for the movie. And only after that he started to work on the screenplay. (Thorne, appendix A)

In an interview, Jonathan Nolan notes that while talking to Thorne and reading books certainly helped in understanding the complexity of the science, this process took a long time. “Sometimes these projects go quickly, sometimes they drag on, but this one lasted quite a bit” (Nolan and Nolan, 2014: 5). After an initial study of the treatment and the underpinning science, Nolan developed the first three drafts of the screenplay in close consultation with Thorne where he changed the first half of the movie greatly.

He [Jonathan] introduced the [new] first act of the movie, which is the period – well, as you know, in screenplays you don’t spell out where an act ends. But the screenwriter and the people developing the film have a clear picture of where’s the first act, where’s the second act, where’s the third act. (Thorne, appendix A)

Act-structure is, often times, the first consideration when framing the plot of the screenplay to come. It is “one of the most important storytelling tools in screenwriting: it creates pace, rhythm, atmosphere, narrative flow, point of view, a context for meaning and a fundamental way to interweave subtext” (Batty and Waldeback, 2019: 31). Functioning as supporting pillars around which the story is built and supported, each act represents not only a place for active questions to be established in the mind of the audience as a means to entertain: acts can also give the ideas of the film a sense of organisation in the minds of the audience to help with information retention and understanding. For this reason, this thesis considers the script development process as useful method for the construction of messages for environmental and social causes.

The first act of *Interstellar* is the segment on earth before the protagonist go into space. Compared to what Thorne and Obst had presented in the initial treatment, the story for the first act “was enormously changed” by Jonathan Nolan, although the remained faithful to the

science (Thorne, appendix A). And it is at that point, in the first act, that Nolan introduced the climate issues. According to Thorne, “the climate issues were never an issue of climate change, although it might be interpreted as that” (Thorne, appendix A). Due of a lack of testimony from Jonathan Nolan, it was not possible to know his exact views on the writing of the screenplay in collaboration with Thorne for the first act. Nonetheless, the scientist played a significant role at this writing stage and was able to provide useful information about the process that can also suggest the screenwriter’s reactions to this collaboration. Thorne explains that while Jonathan Nolan was actively working on the screenplay, they would meet roughly every other week at the faculty club at Caltech:

We would discuss science issues in the screenplay, brainstorm together and throw ideas back and forth. This often led me to write documents that I would send to him about the science issues that we had been discussing. I would go off to do calculations and write documents, perhaps a three-page document about pieces of science for the movie. So, it was a collaboration in that sense. (Thorne, appendix A)

While Thorne and Jonathan Nolan were working on the development of these ideas for the screenplay, Obst worked very hard to keep Paramount Pictures (with whom they had originally signed) out of this process, so that Thorne and Nolan could maintain creative autonomy on the story (Thorne, 2014: 5). *Flexibility* in the embedding of science in a fictional plot play a central role in early development stages. However, in a production like *Interstellar*, flexibility is needed not only in the way the filmmaker and the scientist try to balance the scientific notions with creativity, but also in establishing what represent an ‘accurate’ science in these scenarios (Kirby, 2013: 119-143).

Speaking about his role in incorporating the science in the screenplay, in the 2014 interview Jonathan Nolan emphasised that Thorne’s motivation for making the film and the birth of a friendship between them were the key for a successful collaboration.

Kip is simultaneously a brilliant, brilliant scientist, but also a very kindly and patient explainer of science. He’s of the philosophy that all these grand discoveries that he and his mates have come up with, if they can’t be articulated back to regular people – people like me – then of what use are they? [...] So Kip - in his books, in his work - has concentrated on finding ways to relate these things on a human scale. And that inevitably brings you to this view of natural events as they relate to us, and our families and our relationships. (Nolan and Nolan, 2014: 3)

From this perspective, the creation of stories based on human relationships for a fictional narrative and the spectator’s identification with these characters’ struggles, wants and needs

(Cattrysse 2010, Finnegan, 2016) are key tools for both the screenwriter and the scientist who aim to reach and entertain a wider audience.

Due to my specific interest in the portion of the film that led critics to brand *Interstellar* as a cli-fi film, I asked Thorne how he and Jonathan Nolan approached the development of Act 1 of the screenplay where the environmental disaster is introduced. In our interview, Thorne stated that “the climate issues were never an issue of climate change, although they might be interpreted as that”. What part of the audience perceived as a natural catastrophe related to climate change was in fact a blight, a plant disease, specifically one that biologists called “a lethal generalised blight”, which in the film is “destroying systematically all the crops that we depend on for food” (Thorne, appendix A). The idea for a blight that, as Thorne specified, was to be attributed to Jonathan Nolan, was specifically chosen by the screenwriter to avoid the idea of a man-made catastrophe. Jonathan Nolan explained his views about the choice of the blight:

We’re sort of in this moment in which humans are obsessed that we’ll prove our own undoing -that we’ll poison the planet, we’ll destroy ourselves, and all these things. But I thought it would be more interesting to find a slightly less personal Armageddon. [...] The blight and the dust [storm] provided what I thought was a great, impersonal way for the planet to sort of gently suggest that our time here was over. That it was the moment to move on, rather than being something that we had brought on ourselves. (Nolan and Nolan, 2014: 3).

At the beginning, the screenwriter was imagining Cooper’s world as a place hit by a series of catastrophes where life is somehow still tolerable. The people in this world would think that natural disasters are over and that their condition may start improving; the truth though is that “the human race is doomed” at this point as the magnitude of the blight is destroying one crop species after another, and it is doing it very quickly (Thorne, 2014: 106). The one imagined by Jonathan Nolan is also an era when people are discouraged to read about science, and more generally to be educated to go to college; instead, they are encouraged to work on the farms. Texts books about science are replaced in schools with other tools to allow the population not to repeat the same mistakes of the past. For example, events such as the Apollo Mission are described as fake propaganda, leading the young generation to believe that the lunar landing never took place.

In the book and in our interview, Thorne narrates how, at first, both him and Obst were uncertain regarding Jonathan Nolan’s idea of setting the movie in “an era when civilization is a pale remnant of today’s and is being dealt a final blow of blight” (Thorne, 2014: 105). The

two concerns were mainly about the scientific and cultural authenticity of this scenario depicted by Jonathan Nolan and, specifically, whether or not it was scientifically possible that a blight could wipe out all edible crops yet allow humans to still survive in this situation. Thorne refers to this scenario as ‘Cooper’s world’. Thus, to a certain extent, the challenge for Thorne and Jonathan Nolan was to find and agree on the depiction of a catastrophe that would be scientifically plausible for ‘presaging the Apocalypse’, one of the four basic myths of climate change (Hulme, 2009). Therefore, in order to portray an authentic scenario in which the blight could occur and “to get the best science”, in July 2008 Obst and Thorne organised an evening workshop at Caltech where they brought in the best experts in biology to discuss natural events that can have catastrophic effects on the Earth.

Thorne stated that in the two-and-a-half-hour meeting, him, Obst, Jonathan Nolan and four biologists from Southern California “were brainstorming about things that could go wrong that could cause great problems and make the Earth not liveable for humans anymore. Climate change was not among them because we were focusing on something that could happen rapidly on a timescale of a hundred years” (Thorne, appendix A). In *The Science of Interstellar* (2014) Thorne dedicated a section of chapter III named ‘Disaster on Earth’ to these specific conversations with the biologist Elliot Meyerowitz, an expert in plants; Jared Leadbetter, an expert on the diverse microbes that degrade plants; Mel Simon, an expert on the cells that make up plants and how they are affected by microbes; and David Baltimore, a Nobel Prize laureate with a broad perspective on all of biology (Thorne, 2014: 105). As described in the book, the four experts suggested several scenarios in relation to the blight and human survival. For the purpose of this case study, I selected a few of those proposed by Leadbetter and Baltimore.

Leadbetter, first focused on the fact that today we are largely depended on a global system for food growth and distribution and water distribution as well. If a biological or geophysical catastrophe affecting this process breaks down in a certain area this would force people to migrate. However, in Cooper’s world, the vastly reduced population and a return to agrarian society would make the production and distribution less of a problem – or at least one that could lead to the end of the human species (Thorne, 2014: 108). The other scenario proposed by the biologist is a world where people are panicking about global warming due to the increase of carbon dioxide in the atmosphere. Leadbetter suggested that, a way to solve this problem could be to fertilize the oceans with iron to produce algae that will eat the atmospheric CO₂ through the photosynthesis. In turn, this could cause the algae to produce toxins that will poison the oceans, resulting in a big problem for humans since we rely on fish and plant life. But, he doubted this could be catastrophic for humans as experiments have been done in the

past and the algae produced were not noxious, though in another experiment might be. Another suggestion was the possible development of pathogens that can attack the human body, plants and animals, a battle that has always existed and that we battle with a sophisticated immune system. According to Leadbetter, at a certain point, a catastrophe that is making the pathogens change so fast that our immune system can't keep up 'could happen', but this is another unlikely situation.

However, in the end, Baltimore suggested that: "to wipe out humanity, there might be no better way than a blight that attacks plants. We are dependent on plants to eat. Yes, we can eat animals or fish instead, but they eat plants." (Thorne, 2014: 110). A discussion started then about the differences between what is defined as a specialist blight or a generalist one. A specialist blight will only attach one group of plant but, according to the conversation, the lethality of it can be very high, it can destroy up to 99% of a very specific group of plants. However, the experts stated that it is possible to imagine a very lethal specialist pathogen becoming a lethal generalist, for example one that attacks chloroplasts, which are crucial for the photosynthesis and without this the plant would die. The conclusion of this brainstorming session was that a blight which would become so lethal to attack all the plants and make the world a desert is possible but not very plausible. Nonetheless, this became the basis for 'Cooper's world': an act of balance between science and imagination of future environmental threats.

While generally in sci-fi film productions the possibility of re-creating certain scenarios in the real world "is not the point" for neither the scientist nor the filmmaker (Kirby, 2013: 159), Thorne and Jonathan Nolan dedicated a big portion of the script development process to researching the science to justify the events that set the protagonists on a specific journey (e.g. the inciting incident of the story) and the following choices made by these characters. In our interview, Thorne highlighted that besides understanding whether such blight could occur and what it could do to our environment, this particular brainstorming session also served "to underpin some of the dialogue in the film" (Thorne, appendix A), especially when in Act 1 information about the environmental disaster is provided by the characters. After our interview, in a follow-up exchange of emails, professor Thorne also remarked: "I thought the screenplay and the movie were clear that the issue was a blight and not climate change. Nowhere in the movie was the phrase climate change ever used. The word blight appears four times" (Thorne, 2019, appendix A). In *The Science of Interstellar* (2014), Thorne reports that the final consensus on the development of 'Cooper's world' was that this is a scientifically possible scenario, "but not very likely". And this is why, Thorne explains, he labelled this chapter with

the letter “S” for *speculative* (Thorne, 2014: 106). The process of writing speculative scenarios for *Interstellar* was a concern not only in the early development stage, but also in a second pre-production phase under the director Christopher Nolan. The next session will explore such phase of the development of the script as Spielberg pulled out of the production of *Interstellar* and the film went into turnaround.

Negotiating science in pre-production and production stages

In November 2007, Thorne, Obst and Spielberg agreed on a structure for the screenplay based on Jonathan Nolan’s new ideas for *Interstellar*. However, that same month the Writers Guild of America called a strike and the screenwriter had to stop working on the draft. Three months later, Nolan re-started his work on the draft. He continued this phase of the development by producing three drafts in total. In June 2009, Jonathan Nolan presented the third draft to Spielberg but then disappeared from the scene. In his book, Thorne explains that by then Jonathan Nolan had agreed to work on *The Dark Knight Rises* (2012) with his brother Christopher Nolan and, at the same time, his father became very ill, which forced Jonathan Nolan to spend several months back in the UK. Thorne started to fear that Spielberg would lose interest in the project, but in the end the director waited for Jonathan Nolan to come back (Thorne, 2014: 6). On the 9th on June 2010, “with Jonah deep into draft four” (Thorne, 2014: 7), Obst called Thorne to inform him that Spielberg and Paramount could not reach an agreement for the next phase of *Interstellar* and the director was ready to leave the project. In our interview, Thorne explained that Spielberg, “who carries a lot more movies in the creative phase that he can possibly make”, had to decide between continuing to work on *Interstellar* or to make *Lincoln*: “and he chose *Lincoln*” (Thorne, appendix A).

Before Spielberg had officially left the project, Christopher Nolan told Obst that he was interested in taking over if/when Spielberg dropped out, but Christopher refused to negotiate any details about taking over the project until he finished *The Dark Knight Rises*. For the team, this meant having to wait quite a long time for the production of *Interstellar* to move forward. Thus, from June 2010, Obst and Thorne waited until September 2012 when a new negotiation process began between Christopher Nolan and Paramount. In his book, Thorne narrates that Christopher Nolan had made it clear that he would only direct *Interstellar* if Paramount shared it with Warner Bros., the studio he had worked with for the production of his previous films. This was a very complex deal due to the rivalry between the two studios, but finally in December 2012, Lynda Obst emailed Thorne to inform him that an agreement had been reached

and Christopher officially became the director of *Interstellar* (Thorne, 2014: 7-8). In our interview, Thorne stated:

[When Christopher took over] he himself wrote the last three drafts of the screenplay. He did not change the first act - which of course is the portion that interests you - very much, but he did change the second half of the movie greatly, so it became largely his movie. (Thorne, appendix A)

In regard to the development process of the script, Thorne also noted that the transition of the re-writing of the screenplay from Jonathan to Christopher Nolan was an easy one. Inevitably, the screenwriter must always hand the screenplay to the director so that the leading visionary of the production can incorporate their artistic style and sensibilities into the work. However, this can sometimes be a precarious point in the production, when alternative visions or ideas can take the project in other directions. In this instance, Christopher knew Jonathan's screenplay well since he had talked a lot about it to his brother during the development under Spielberg's supervision. According to Thorne, this is also generally how the two had co-authored previous scripts: "Jonah writes the initial drafts, and then Christopher Nolan takes over and re-writes, thinking carefully about how he will film each scene as he crafts it on paper" (Thorne, 2014: 8).

An important example of the changes made by Christopher Nolan to the script is the addition of the dust clouds and dust storms to the story. On this aspect, Christopher Nolan explained:

For me, the whole dust situation came from looking at Jonah's original draft and focusing on the idea of a return to an agrarian society. [...] When you research the kind of farming community that existed in the past, they're very subject to the elements, they are subject to the natural disaster. And whilst I think the blight idea was always extremely compelling as a device, it was inherently not very visual because you're talking about things not growing or dying. (Nolan and Nolan, 2014: 2)

Thus, in this case the inclusion of an element such as the dust was necessary in order to visualise the original disaster, i.e. the blight. The dust clouds and the dust storm in Act 1, and the fire at the farm in Act 3, allowed the screenwriter/filmmaker to realise a visually more entertaining scene. The idea of 'the elements' and 'the natural disaster', might have also contributed to the labelling of *Interstellar* as a cli-fi film. Influenced by iconic images of the impacts of climate change (O'Neill and Smith, 2014), in this case the storm, famine and drought, the audience is

easily led to associate *Interstellar* with the climate change problem. Given the importance of visuals for cinema, Christopher Nolan's further development of these aspects for the story into the screenplay is a natural step, but it required further reflection on the authenticity of those scenes. For the dust storm, Christopher Nolan explains that the inspiration came from watching Ken Burn's documentary *The Dust Bowl* (2012); however, when applying this research to his own work, he changed the images to make them more believable for the audience.

[Burn's documentary] seems like science fiction. You cannot believe the images you are seeing, the real images. The descriptions are heart-breaking and amazing, but you are looking at pictures and film of things that if you put them in a movie, directly, people wouldn't believe it. When we do the dust clouds and the dust storms in the film they are toned down from the real imagery because the real imagery would never be believed – and that really happened. (Nolan and Nolan, 2014: 2)

Contrary to contemporary accounts of the original dust storm (1930), which were connected to bad farming practices, the blight in *Interstellar* is blamed solely on nature; it is the planet that has failed humans rather than the reverse. This is further evidence of the writers' efforts to stay away from the 'man-made climate change' discourse. As explained in the film, "the atmosphere is 30% nitrogen. Humans don't breathe nitrogen. The blight, as it expands, sucks the oxygen from the air. In the end, those who don't starve to death will suffocate" (Svoboda, 2016: 50).

Another important element for the visualisation of the disaster was the dramatization of the blight by setting fire to Cooper's farm in Act 3. The visual representation of Cooper's farm and its surrounding environment first suggests that characters live in a condition of drought, possibly an indication of famine, where the crop is struggling to survive. The ocre colour texture of the image, the sandy remains of the dust storm around the farm, the poor condition of the structure of the house, the humble appearances of the characters and of their way of life, are all indications of a struggling environment with very little hope for recovery. For the advancement of the story and a second climax, Christopher Nolan wrote these scenes where the characters are forced to flee the farm due to the fire. While the description of the fire is brief in the script, the planning of the scene required nearly two years. In the *Interstellar* Blue Ray Special Features (2014), the director explains that the farm was built in a particular position in the landscape by the production and they took on the enormous challenge of planting 500 acres of corn around the house, which was subsequently burned during the shooting (The

Making of *Interstellar*, 2014: min 00.05.48). This is because Nolan wanted to avoid the use of CGI for the farm scenes.

In their very first meeting, Thorne provided Christopher Nolan with those same science guidelines that he had proposed to Spielberg in order to maintain a high level of authenticity: “Nothing will violate firmly established law of physics; speculations will all spring from science” (Thorne, 2014: 8). Christopher Nolan worked intensively on the screenplay from January to May 2012 and from time-to-time Nolan asked Thorne to go to his office to talk about science issues or to read a new draft – to then meet and discuss appropriate changes.

Each draft of the screenplay they would give it to me to go over it and give feedback [...] So every draft of the screenplay I gave notes that could be many pages long. Typically, what we were doing is we were looking for science ideas and how they would go onto the film. And I didn’t have views as to how they were incorporated into the story, but it was a brainstorming in research of science ideas. (Thorne, appendix A)

Thorne remarked that such discussions were very long, typically ninety minutes, sometimes followed by phone calls, further thoughts and several pages of memos with pictures and diagrams for Christopher Nolan. In his book, Thorne reveals that Christopher Nolan’s ideas occasionally seemed to violate his guidelines, but he almost always found a way to make them work scientifically. On this point, Christopher Nolan explained that several of the main narrative ideas that he had put in the script based on passages from Thorne’s books, were also the scientific ideas that he argued with him the most:

I found this fascinating because it meant to me that even though he’s written it in a book ten years ago, he was still completely prepared to take it as a fresh story element and argue about whether or not it could really be. [...] And I found that surprising and a little frustrating at first, and then the more I talked to him I realised that he approaches these things from a very pure point of view. So it’s not about whether he said it ten years ago or not, it’s about what does he believes now – what the science tell him. (Nolan and Nolan, 2014: 4)

Christopher Nolan, like Jonathan Nolan, seemed positively inclined to follow Thorne’s guidelines, but in the *Faber and Faber* interview he highlights that when he started to work on the project “there was a very, very dense amount of science” that Thorne was quite keen on that he had to gently pry him away from. Christopher Nolan also explains that him and Jonathan Nolan were able to “address some very sophisticated scientific concepts in the movie by just simplifying these concepts” (Nolan and Nolan, 2014: 4). In the interview, both Jonathan and

Christopher Nolan explained that they would prefer to not go too far with understanding the complexity of the science because they felt that the audience would not be able to, “unless this could be well summarised as simple rules” (Nolan and Nolan, 2014: 5). These steps are representative of the necessary discussions and negotiations that the screenwriter/filmmaker and the scientist must undertake in the script development process in order to find a way to make the science work for the script and the story.

In the end, the screenwriter and the director decided that the science concepts that felt “more instinctual”, when studying them with Thorne, were “the worthwhile ones because the actual ones don’t play for an audience at all” (Nolan and Nolan, 2014: 5). From this perspective, the collaboration with the scientist in the production of *Interstellar* did not only serve to inform the screenwriter and the director about the specific science: it helped them figure out which kind of science is the more appropriate to write as part of the fictional narrative in order to retain the audience’s attention. This demonstrates that the embedding of the science has an effect on the script development process. And this process is not a simple transfer of knowledge; it first requires the synthesis of that scientific knowledge before it can be embedded into the screenplay.

Visualising science in post-production

Due to Thorne’s commitment to authenticity in *Interstellar*, I asked the professor if, at any point, he felt that the scientific accuracy that belongs to his work was, somehow, ‘in danger’ and/or if particular adjustments were made in relation to the science in order to make the film more appealing for the viewers. This is significant as, given the underlying pressures of commercial success that Hollywood films are adherent to, it makes sense that a film with such a large budget and with such high expectations would be at risk of interference so as to result in a more audience-friendly screen work. But it is not just a question of studio interference that makes this an important area of discussion. The collaboration between screenwriter and director is naturally imbued with an unspoken tension where conflicting objectives and visions for the project force the creatives to make compromises. These tensions belong to most productions but overcoming these is even harder when scientific authenticity is one of those objectives. In regard to this aspect, in our interview Thorne discussed one of the changes made by Christopher Nolan to the prologue of the film – as initially developed by Thorne and Jonathan – involving the discovery of the wormhole. The wormhole in the prologue is

discovered because of LIGO, a project to search for gravitational waves coming from the distant universe.

When Christopher came on-board, he decided very quickly that he was going to remove that prologue because we weren't using gravitational waves anywhere else in the film and he didn't want to confuse the readers by having too much science as he wanted to introduce some additional science. So, I didn't argue with him. It was reasonable because gravitational waves weren't being used and so I just let it go. (Thorne, appendix A)

However, one year after the film came out, LIGO ultimately succeeded and Thorne was awarded the Nobel Prize in Physics for this specific project in 2017. Three days after the discovery of gravitational waves was announced, Christopher Nolan telephoned Thorne and asked him to meet him at the Warner Bros. Studios, where he was in pre-production of *Dunkirk*. According to Thorne, Christopher Nolan spent an hour and a half talking about how he regretted having removed LIGO and gravitational waves from the film and how he could have incorporated them into the movie (Thorne, appendix A).

In our interview, Thorne discussed other changes/issues in post-production in relation to computer graphics.

There's a trip through the wormhole in the film, and the wormhole had been designed to make it interesting viewed from the outside in terms of the mathematical design of the wormhole. But when they [the team] then did the computer graphics solving the Einstein equations for the propagation of light, when the crew was travelling through the wormhole, it was not a very interesting trip visually; it was a pretty boring trip. (Thorne, appendix A)

At that point Christopher Nolan asked Thorne to go to his house, "where he does most of his postproduction work", in order to show him and together discuss the simulations, 'the visuals', for the trip through the wormhole. By looking at those sequences, both the scientist and the film director concluded that it would not be a very interesting section to watch for the audience and changes needed to be made.

That was the one and only point in the movie where it diverged in a strong way from the real science. We had a discussion of what to do and he [Christopher] made a decision in consultation with me and Paul Franklin, who was his VFX supervisor, to combine the videos in an interesting way for trips through different shapes of wormholes, and then use some artistic license to distort them and make them more interesting. [...] That was a post-production issue. We all agreed on it. (Thorne, appendix A)

Reflecting on the collaborative process with Christopher Nolan, Thorne claimed:

The way that I worked with Nolan was a real collaboration and brainstorming together and searching for things that worked well. Each of us bending on issues by mutual agreement when a problem like this arose. [...] In the end, of course they were his decisions, but he did not make them without consulting with me and, in all cases, we reached an agreement. (Thorne, appendix A)

There were few other very minor things that Thorne wished to change but it was accepted “that nobody else would notice”. For example, there is a scene in the film where the spacecraft travels around an ice planet and its wings clip along the edge of the ice cloud.

That kind of cloud could not really hold itself up against the strains due to its own weight and in that particular shape, but nobody except a real engineering expert or geophysicists would know that - and this is one scene that lasts for about two seconds. I noticed it from my point of view, but nobody has ever commented on that. (Thorne, appendix A)

Thorne highlighted that *Interstellar* is a complex movie where it is very difficult to pick up every single “mistake”. However, according to the scientist, those few mistakes that are present in the film in the end “are tiny things that don’t amount to much”. In response to my question, Thorne added: “but you asked if there was anything I was unhappy with and so here they are. I wasn’t consulted, [...] and by the time I saw it was too late” (Thorne, appendix A).

In my follow-up exchange of emails with Thorne, the scientist also specified that Christopher Nolan had never developed a shooting script for this production, as it often happens when the screenplay is passed on to the director.

There was no ‘shooting script’ for *Interstellar* as distinguished from Jonathan’s script. Both Christopher’s and Jonathan’s script had the same organizational structure. There were no shooting instructions inserted into Christopher’s script. (Thorne, 2019, appendix A)

A shooting script is the final version of the screenplay that is written in collaboration with the director. This is the draft that, as the name suggests, will be used in the filmmaking process. The shooting script is instilled with additional directions, such as references to camera angles, edit notes and a degree of specificity that a screenwriter would otherwise avoid in earlier drafts. This is where the director’s vision starts to supersede that which the writer has been working on for so long.

According to Christopher Nolan, different scenes that he had included under his own development were fully realised in post-production rather than in the script. For example, in the interview *Faber and Faber* interview, Nolan describes that scenes such as the first docking on *The Endurance*, the interplanetary spacecraft, “had been fairly much a throwaway in all the scripts” and, in his drafts, “it was one line. But the action takes up a lot of screen time” (Nolan and Nolan, 2014: 9). The journey of *The Endurance* and the space science around it were possibly the most debated elements between Christopher Nolan and Thorne during the different production stages. As specified in his book and in our interview, in post-production Thorne played an important role in the creation of the computer graphics while collaborating with the visual effects company *Double Negative*. The VFX supervisor Paul Franklin scored both the BAFTA and the Academy Award for the visual effects in *Interstellar*. Thorne specified that, all the effects related to astrophysics in the film were based on solving equations that came from Albert Einstein for the propagation of light around black holes and wormholes. He spent about three months working full-time with the team at Double Negative, deriving equations for them to use for computer simulations and to produce all of the visual effects that we see in the film. Thorne explained:

We had to invent new methods of doing simulations because for light propagating near a black hole gets so distorted that the images were badly flawed (if you used the standard techniques used by everyone both in astrophysics and the movie industry to do simulations and make these kinds of images). So, we had to develop an entirely new set of computational tools for achieving this. (Thorne, appendix A)

The development of these computational tools and the collaboration between Thorne and computer graphics team, are described in the technical paper *Gravitational lensing by spinning black holes in astrophysics and in the movie Interstellar* (James et al, 2015), in the journal of *Classical and Quantum Gravity*. Those techniques, which are an outgrowth of this film, are now being used by other Hollywood productions and by physics departments. In the history of cinema, the development of CGI and other special effects technologies have naturally required the involvement of science consultants in the production in order to increase visual realism (Kirby, 2013: 225), and *Interstellar* was no exception. From an analysis of the dynamics in this production, it is clear that the collaboration between the scientist and the filmmaker, especially at the editing stage, was one of mutual assistance. As Thorne kept working on the embedding of scientific elements in post-production by helping with mathematics, the special effects team is to be acknowledge for helping Thorne visualise his study for the first time. Thorne’s studies

on the wormhole never actually led him to visualise its shape, which in 3D resulted as a sphere (The Making of *Interstellar*, 2014: min 00.17.55). Thus, the development of the film represented an important moment in Thorne's study of astrophysics.

As the analysis of the making of *Interstellar* reveals that a significant portion of the science was negotiated and embedded during the editing, it is possible to affirm that the script development process of *Interstellar* continued all through the post-production stage. While scientific authenticity is considered as a flexible concept (Kirby, 2014), so is the script development process that always involves multiple voices working for multiple agendas, which highlights the deeply collaborative nature of screenwriting (Batty and Waldeback, 2019: 136). In the end, the fluidity and flexibility observed in the making of *Interstellar* demonstrates that both the development of the script and the embedding of the science are not confined to the screenwriting stage. This case study also shows the unique of the collaboration between Thorne and the Nolan brothers if compared to other productions. While someone in Thorne's position might have a key voice in the early stages of the story's inception, it is rare to see someone taking such an active and influential role well into the post-production process. Typically, films such as this will have incredibly tight turnarounds for visual effects, sound design and general editing. Despite the inherent creative nature of these stages, they are not seen as a place for experimentation due to the costly nature of them and the tight turnarounds that go with them. *Interstellar* has proven that cli-fi film productions can be a useful site of research for studying the interdisciplinary collaborative process between a scientist and a filmmaker.

For this production, Thorne was also praised for helping the actors to understand the science and interpret their role as experts in astrophysics. However, in our interview, Thorne specified that it was not the same process of working as with the screenwriter and the filmmaker; it was more about the actors "asking questions to understand how scientists think" rather than the professor "feeding them the science".

It was about them trying to understand the characters they were playing more deeply. [...] So, it was that kind of conversation except with Anne Hathaway who, it turns out, calls herself a physics geek and she asked me questions I never expected to be asked. She was well informed. [...] The lovely thing is that everybody on this film was really enthusiastic about doing a movie about deep and interesting science. (Thorne, appendix A)

Moreover, Thorne reported that while helping the actors, Michael Caine's wife came on set as Caine had advised her to meet Thorne in person. Thorne said: "I asked her why, and she said

that Christopher Nolan had told Michael that his role had been patterned after me, which I didn't know" (Thorne, appendix A).

Since its release on the screens *Interstellar* has been categorised by critics and scholars as representing multiple film genres: cli-fi, sci-fi, apocalyptic drama, thriller and the disaster film. As listed in the introduction to this chapter, many articles have reviewed *Interstellar* as a cli-fi. Svoboda (2016) also claimed that *Interstellar* falls in the 70% of films that use either the disaster or the apocalyptic genre for the communication of the challenges related to climate change. By following Svoboda's study, one way to link *Interstellar* to a specific genre could be by looking at the role of the scientist in the story and the message that this seeks to send. In dystopic films the figure of the scientist seems to dissolve, families are broken and there is nothing left but to connect with other members of the destroyed community in order to survive. In the case of the apocalyptic film there is still one scientist left, though it is too late for the science to find a solution as the environment has already turned against the population (Svoboda, 2016: 56). On the other hand, compared to the apocalyptic genre, in the disaster film the role of the scientist/science body is definitely more central to the story. The disaster genre also tends to leave the audience with a more positive final message as the order of things is restored and the population is saved. Therefore, it can be argued that *Interstellar* lies between the disaster and the apocalyptic genre, since the last remaining scientists from NASA play an important role throughout the story whilst the story clearly suggests that the human race is doomed to come to an end - unless a new 'home' is found in space. In the *Interstellar* Special Features, Christopher Nolan also explains that he never wanted to "perpetrate dystopia" and choices such as bucolic setting, and a simple way of life for the characters, were made to make it "more emotional to leave the Earth".

On the other hand, by applying screenwriting theories, specifically Phil Parker's classification of genre in screenwriting (1999), *Interstellar* could be defined as an *epic drama* because: 1) the main story centres on the protagonist's desire to change and/or experience a wider world; 2) the locations are various and are determined by the development of the major conflict; 3) thematically the story centres on a desire for validation (Parker, 1999: 91-160). Nonetheless, *Interstellar* also carries the characteristics of a thriller as 1) an element of betrayal is crucial in the plot [Prof Brand lied about the mission from the beginning/Dr Mann tries to kill Cooper]; 2) action centres on a threat to the central protagonist/s; 3) thematically, it centres around injustice and/or the morality of individuals (Parker, 1999: 91-160). Thus, this analysis of the narrative reveals that the complexity of the construction of the narrative of *Interstellar*

is also reflected in the multiple readings that could be done of this film and the difficulties in categorising it as one specific genre.

In the interview from the published screenplay, Christopher Nolan discusses the differences between science fiction and speculative fiction in relation to *Interstellar*, arguing that through these genres the screenwriter can “address underlining problems and ideas that are going on in society right now” by setting the story in the future. However, according to the director, when it came to shoot the film, he went the opposite direction:

We didn't allow for any kind of futurism or any kind of difference from contemporary technology and contemporary society. The reason for that is it is more speculative fiction than science fiction. You choose what your speculations are about. And I didn't want to speculate about the colour of people's trousers in the future or what kind of computer screens they'd be using. I think that speaks to the differences between science fiction and speculative fiction just as terminology. (Nolan and Nolan, 2014: 1-2)

In *The Making of Interstellar*, Christopher Nolan remarks on the challenge of working with this genre as “you are easily caught in the science”. During the different stages of production, the director went back to his script regularly to make sure that each aspect of the science was linked to the characters' journey by “incorporating an organic people-based methodology to every aspect of the film [...] because ultimately the film is about human beings” (*The Making of Interstellar*, 2014: 00.07.00min). Therefore, speculative scenarios in a film like *Interstellar* become more than a sum of isolated entities and events. The writing and making of these elements/scenarios involve an extensive process for which both the science consultant and the screenwriter/filmmaker not only develop possibilities for each distinct element/scenario, but also work out how all these elements would fit together (Kirby, 2013: 152). What makes the script development process of *Interstellar* unique is indeed the strong commitment shown by Thorne and the Nolan brothers to guarantee the balance of all these elements throughout the narrative while remaining faithful and authentic to the science.

In our interview, Thorne stated that in terms of science communication *Interstellar* “was tremendously successful” although the film took a very long time to be made: almost 10 years from the first brain storming session in 2005 to the release in 2014. Whilst this case study does not seek to answer any specific questions about the extent of the impact of climate fiction films on the audience, with *Interstellar* it is difficult not to mention the success of the film in bringing some of its viewers closer to the science. In the interview, Thorne remarked the total sales ticket for *Interstellar* were about 700 million dollars and roughly 150 million people saw

the movie. In South Korea, a country of 50 million people, 10 million people went to see the movie, which is 20 percent of the population, “as the government was promoting it as part of their overall policy to educate the citizens of Korea about science and technology, about their power and importance” (Thorne, appendix A). Thus, besides assessing *Interstellar* based on its scientific authenticity, one is also inclined to consider it for its teachability (Manzo, 2017). On this topic, Thorne added:

In China, the impact [of the film] was similar [to Korea], maybe not that huge, but quite significant. Less so in the United States and other countries. But the impact in terms of inspiring people about science overall around the world was really very big compared to anything I could have done in any other way. (Thorne, appendix A)

Therefore, a film like *Interstellar* can serve to create public excitement about science research and new technologies (Kirby, 2013). On this note, I asked Thorne his opinion on the use of fiction for communicating science. Thorne revealed that he had initially considered the idea of having the science in *Interstellar* explained in a documentary in order to educate and inform the audience. In the end, he opted for the writing of a book where he could go into the science more deeply and more carefully and have more control over it: “so, the combination of *Interstellar* to inspire people and my book about the science of *Interstellar* to educate was the route I chose to go” (Thorne, appendix A). On the use of documentary, Thorne added that, from his point of view, and based on his own experience and career goals, he prefers to communicate through fiction rather than resorting to the use of the documentary genre. Like other scientists, Thorne found that the popularisation of science through fictional film can facilitate the communication of his research findings/concepts to the non-specialist audience (Kirby, 2013: 233). Thorne remarked:

My goal was always to inspire people about science and about science issues. But it was clear I could have a much bigger impact on the general public with regard to the science through this movie than I could through any documentary. And I felt in the end I could impact a smaller number of people but have a much more effective impact on education through the associated book. [...] Nearly 150 million people saw this movie. There’s no way any documentary could ever reach that many people. (Thorne, appendix A)

As argued by research in ecocinema, the use of fiction remains an important tool for mobilising and framing the public’s opinion and the extensive power of emotions in these productions is of primary importance in affecting audiences (Brereton, 2015: 267).

While reflecting on the categorisation of *Interstellar* as climate fiction, Thorne highlighted:

The word ‘climate change’ is not used in the film. It has been interpreted by viewers and reviewers that it is climate change, but we never intended for it to be. There is a big difference between climate change and something that could happen in a hundred years. We were focused on things that could really go wrong very rapidly. So that was the big difference. (Thorne, appendix A: ?)

Following the content analyses of the different visual representations of climate change in the media and the messages that the films tried to communicate, it is easy to justify the association between *Interstellar* and *climate change*. This association may have not been calculated by the writers and the director during the production stages, but the film definitely relies on the use of iconic images that have become part of the everyday visual environmental vocabulary in Western societies (Cox, 2013). In an article by Reuters (Sinha-Roy, November 7, 2014) Christopher Nolan reiterated Thorne’s feeling about environmental messages in the film. When the interviewer asked Christopher Nolan if it was his intention to address climate change in the film, due to his representation of “the Earth undergoing a severe environmental disaster brought by grounds drying up”, his response was that “it was not a conscious decision”. According to the director, he and Jonathan Nolan generally “try not to be too didactic in the writing” and “try not to give any particular message or sense of things” in order to facilitate the audience’s engagement with the story. In regard to the association of *Interstellar* with climate science and climate change, Thorne concluded:

I don’t think we have any objection to people interpreting the film that way, after all it is a movie intended to entertain and inspire and my goal in this movie as a scientist was not so much to educate the viewers about science as to inspire them and to make them think about science. So, from that point of view, I’m not troubled if it is misinterpreted as climate change. [However], it was never intended that way and if you look closely at the film, it isn’t depicted that way. (Thorne, appendix A)

While remarking his passion and commitment to the world of cinema, Thorne indicated that he had been previously involved as an advisor on *Contact* (Zemeckis, 1997) with Carl Sagan, and that he was developing another story where the treatment was co-written with closest friend, Stephen Hawking – sadly, Stephen Hawking died a few weeks after my interview with Thorne. On the new project, Thorne said: “the screenwriter is doing a second draft of the screenplay at the moment. We’re doing it the same way [as *Interstellar*] – so always

brainstorming together. It's a different film, different director, different studio and different screenwriter" (Thorne, appendix A). Although there is not an exact date for his next film, we can imagine that the professor will replicate the same effort and commitment to collaborate with the screenwriter and filmmaker in order to incorporate scientific concepts in the fictional narrative.

Conclusion

The case study of the production of *Interstellar* has revealed that for an analysis of the collaborative script development process of the cli-fi it is necessary to look beyond the pages of the screenplay. From the first meeting with Obst to the pitch to Spielberg, the early-stage development of the script for *Interstellar* began with a treatment impregnated with science and with Thorne's establishment of guidelines about the embedding of the science in the fictional narrative. Before presenting the early forty-page treatment, professor Thorne and Obst organised brainstorming sessions with leading scientists in order to seek approval and advice from the wider scientific community. Thus, the role of the scientist in the production of *Interstellar*, which in the film industry is usually to provide information to the filmmaker who seeks to create scientifically plausible scenarios to justify extraordinary events, became central to the script development process from the very beginning, since the inception of the screen idea for the film by Thorne and Obst in 2005.

When Johnathan Nolan joined the project as the screenwriter in 2007, under Spielberg's guidance, he too began the job by immersing himself in a deep study of the science guided by Thorne. As evidenced in my analysis of the screenwriter's and the scientist's accounts of their experience, compared to other Hollywood productions, the embedding of the science into the script has added several months, perhaps even years, to the story and script development process. This is not to say that the process was not affected by other factors: The Writer's Guild of America's strike, a death in the Nolan family and Spielberg abandoning the project in 2010 have also contributed to slowing down the pre-production stage, specifically the writing of the script. Nonetheless, this early-stage development is to be remarked for the collaboration between Jonathan Nolan and Thorne in the development of Act 1, the portion of the film that led the viewers and the media to associate *Interstellar* with the cli-fi genre. This case study has also revealed that the complexity of the construction of the narrative of *Interstellar* is also reflected in the multiple readings that could be done of this film and the difficulties in categorising it as one specific genre.

The first act of the movie, which introduces the environmental catastrophe affecting Cooper's world, was the result of several negotiations between the screenwriter and Thorne, who was concerned with finding a scientifically plausible explanation to a scenario that shows humans abandoning a dying Earth to live in space. Following a long brainstorming session with a group of leading biologists, Jonathan Nolan and Thorne agreed on portraying a lethal blight affecting all plants and making the world a desert, which would force people to either die or abandon the planet. Although not very likely, according to the scientists, this could still be a possible scenario or, in other words, speculation deriving from scientific facts. Moreover, according to Thorne, these brainstorming sessions were most useful to underpin some of the dialogue in some key scenes where the disaster is explained by the characters. For a film that has been so firmly associated with climate change, is also interesting to see how, according to Jonathan Nolan, specific creative decisions were made to stay away from the idea of a man-made disaster, which is ultimately identifiable in the film because the use of iconic images of climate change that viewers are used to seeing through the media every day.

The writing of the screenplay for *Interstellar*, as well as more advanced stages in the production, required a big amount of flexibility and openness to knowledge and expertise on both sides. Ultimately, what linked Thorne and the Nolan brothers during the making of *Interstellar* was a mutual interest in finding a way to relate complex scientific concepts on a human scale. This is a goal that is common to both the scientist, who needs to communicate their findings, and the screenwriter, who is naturally inclined to articulate concepts and stories in a way that can be understood and appreciated universally. A film like *Interstellar* can serve to create public excitement about science research and new technologies and, like other scientists, Thorne found that the popularisation of science through a fictional film could facilitate the communication of his research findings/concepts to the non-specialist audience. On the other hand, throughout the production both the screenwriter and the director went back to the script regularly to make sure that each aspect of the science was linked to the characters' journey by "incorporating an organic people-based methodology to every aspect of the film" (The Making of *Interstellar*, 2014: 00.07.00min). From these observations, it is clear that in the collaborative script development process the creation of stories based on human relationships and spectators' identification with the characters are key tools for scientists and screenwriters/filmmakers whose aim is to reach and entertain the wider audience.

The challenges of writing speculative scenarios based on science continued during a more advanced stage of the development when Spielberg abandoned the project in 2010 and Christopher Nolan became an official producer, screenwriter and director for *Interstellar*. With

a new director on board, a new phase of the script development process began as Christopher Nolan brought new elements to the script, like the inclusion of a dust storm and the fire at the farm, which he believed to be necessary in order to make the blight more visually entertaining for the audience. Such scenes, which in the script would amount to a few words, were further developed and reshaped during the production and post-production, demonstrating that the script development is not confined to a pre-production stage. Thorne's involvement in the making of *Interstellar* under Nolan's direction was most significant, as both the scientist and the director described a constant exchange of feedback throughout the whole process in order to balance science and fiction. The collaborative development of speculative scenarios and scientific elements in a film like *Interstellar* is more than a sum of isolated events that the filmmaker puts together in a few scenes of the script. As this case study reveals, the writing and making of these elements/scenarios involve an extensive process for which both the scientist and the screenwriter/filmmaker not only develop possibilities for each distinct element/scenario, but also work out how all these elements would fit together. What makes the script development process of *Interstellar* unique is indeed the strong commitment shown by Thorne and the Nolan brothers to guarantee the balance of all these elements throughout the narrative while remaining faithful and authentic to the science.

For each draft of the screenplay Thorne provided several pages of notes for Christopher Nolan and would discuss this together as, according to Thorne, very often Nolan's ideas seem to violate the scientist's initial guidelines. However, the director was impressed by Thorne's openness to challenging and updating his own scientific principles for the good of the story. By compromising on the kind of speculative science that would be appropriate in each scene, the scientist and the director/screenwriter were able to address sophisticated scientific concepts by simplifying them. In the end, the Nolan brothers favoured the embedding of scientific concepts and rules that could be 'summarised' or that felt 'more instinctual' for a lay public. Thus, the case of *Interstellar* demonstrates that scientists not only serve to inform the screenwriter/director about the specific science: they can also help the latter figure out which kind of science is the more appropriate to write as part of the fictional narrative to retain the audience's attention. This shows that the embedding of the science has an effect on the script development process. And this collaborative process is not a simple transfer of knowledge; it first requires the synthesis of that scientific knowledge before it can be embedded into the screenplay.

The collaboration between screenwriter and director is naturally imbued with an unspoken tension where conflicting objectives and visions for the project force the creatives to

make compromises. This is a problem easily navigated in most productions, but it isn't so straightforward when scientific authenticity is one of those objectives. With Thorne involved in the decision-making process for the story and the screenplay, it was inevitable that some minor issues would arise in the post-production stage when it came to creative choices for some pivotal scenes that were based on Thorne's research principles. As a matter of fact, Thorne's role was essential not only for the writing of the science but also in the production of the visual effects for those scenes which were primarily developed in post-production with the team at Double Negative. Thorne helped Nolan and the VFX supervisor Franklin in the creation of new technology for computer graphics by deriving equations for them to use during computer simulations. At the same time, the special effects team is to be acknowledged for helping Thorne visualise some aspects of his study for the first time on the screen. From an analysis of the dynamics in this production, it is clear that the collaboration between the scientist and the filmmaker, especially at the editing stage, was one of mutual assistance. As a big portion of the science was included in specific scenes in post-production it is possible to affirm that the collaborative development process of *Interstellar* continued to the editing stage.

In the end, the case study of *Interstellar* has highlighted that both the embedding of the science and the development of the script are fluid and flexible processes that in the production of a film are not confined to the screenwriting stages. The analysis also shows the uniqueness of the collaboration between Thorne and the Nolan brothers if compared to other productions. While someone in Thorne's position might have a key voice in the early stages of the story's inception, it is rare to see someone taking such an active and influential role well into the post-production process. Typically, films such as this will have incredibly tight turnarounds for visual effects, sound design and general editing and are not seen as a place for experimentation due to the costly nature of these stages. Overall, *Interstellar* has proven that cli-fi film productions can be a useful site of research for studying the interdisciplinary collaborative processes between a scientist and a filmmaker.

The next chapter presents the exegesis of the first project that I undertook as part of my practice-led research: the collaborative production of the short cli-fi film *Be Tradition*. In the chapter, I will further explore the collaborative script development process in this smaller and equally unconventional mode of practice where, like in the production of *Interstellar*, the scientist was an integral part of the development of the screen idea. The analysis of the writing of *Be Tradition* shows new challenges and approaches to the script development process as the film was produced in an academic context.

CHAPTER 4

Producing the Cli-Fi Short Film: the academic collaboration in the development of *Be Tradition*

Introduction

The case study of *Interstellar* demonstrated that for an analysis of the collaborative script development process it is necessary to look beyond the pages of the screenplay. The screenplay of *Interstellar* underwent multiple changes throughout the production, and the negotiations for scientific authenticity between Thorne and the Nolan brothers continued to the editing stage. Inspired and informed by the findings of the case study, this chapter provides an analysis of my experience in the production of a climate fiction film in collaboration with a science expert. Specifically, this exegesis illustrates how I embraced the role of the screenwriter and filmmaker while producing a short film with Enrico Andreoli, Associate Professor and group leader at the *Energy Safety Research Institute* (ESRI) of Swansea University. Andreoli's work and research focus on *Carbon Capture, Utilisation, and Storage* (CCUS) with the aim of finding new ways for developing sustainable material that can enable the use of carbon dioxide (CO₂) as fuel with renewable energy. The making of this fictional short, *Be Tradition* (2017), was part of a research grant from the *Sêr Cymru, Welsh National Research Network in Advanced Engineering and Materials* (NRN) and a second grant from the *UK Engineering and Physical Sciences Research Council* (EPSRC). Andreoli, who generally employs scientific data and statistics for sharing his work, embarked on this project with the idea of finding an alternative and more creative way of communicating the principles and goals of his research. Filmed in the south of Italy, *Be Tradition* translates the concept of *sustainability* through one of cultural and culinary *tradition*. Information about the project and a link to the film can be found through the Swansea University ESRI website (link: <http://www.esri-swanea.org/en/be-tradition.htm>).

I have been aware throughout my study that there is a discrepancy between the format of my short film and an award-winning film such as *Interstellar*. Nonetheless, the aim of this practice-led research was never to re-produce the feature-length Hollywood film, but rather to 1) 'exercise' and 'experiment' with the making of a film that is based on science related to climate change, and 2) to observe how the collaboration with the scientist would shape the script development process. Screenwriting and filmmaking, as an emerging mode of research, often attempt to satisfy multiple and competing academic purposes and agendas, as well as

trying to meet specific criteria for universities' and governments' impact and engagement agendas (Kerrigan and Callaghan, 2018: 230). The making of *Be Tradition* is an example of how a filmmaker works inside the academy to produce a film as a form of interdisciplinary research while facing not only the challenges of collaboration but also the limitation posed by the aforementioned agendas. As in the case of my project, the goal of filmmaking research in academic contexts is usually to produce and disseminate new knowledge and advance our understanding of life, society and environment, and such research is an activity that begins prior to the film being made (Kerrigan and Callaghan, 2018: 240). This chapter will show how the initial conversations with Andreoli, the application for funding and the negotiations for the embedding of the science in pre-production affected the script development process and the final product.

Producing film projects while engaged as an academic creates an additional complex factor in specifying the filmmaker's identity as it brings a different approach to production and a different set of challenges to that of the industry (Webb, 2018: 176). The analysis in this chapter identifies some of the differences whilst highlighting the similarities between the collaborative script development process in an academic context and the one in the film industry. However, this exegesis focuses on the development of the screen idea during the production of *Be Tradition*, an integral aspect of the script development process that allows to observe both the individual contribution and the process within the group contexts (Macdonald, 2021). Each stage of the development of *Be Tradition*, and the collaboration in general, needs to be considered in the context of our academic collaboration and some aspects of this project might not apply to others. A previous version of this chapter was published in the *Handbook of Climate Change Communication* (Filho et al., 2018) and can be found through Springer Link online under the title "*Reconsidering Fictional Films for Communicating Climate Change Issues: An Analysis of the Filmmaking Strategies Behind Sustainable Energy Narratives*" (Cortese, 2018), pp 123-136. Compared to the published version, the chapter that I present here uses quotes from an interview (appendix B) that I conducted with Andreoli in March 2018 in order to reflect and record his personal opinion on the collaboration after the release of our short film.

The interdisciplinary collaboration in early-stage development

Dr Andreoli and I met at Bangor University on the 11th of February 2015 during the Energy Cohort LEAD Wales LG6 event, where we were introduced by the LEAD research officer Dr

Steffan Thomas. In that occasion, Andreoli and I sat down and discussed my reasons for undertaking a research, the aims of my study, and what I wished to achieve in terms of practice-led research, i.e. the study of the script development process through the production a fictional narrative about climate change in collaboration with a scientist. Dr Andreoli's study of sustainable energy and CO₂ represented the perfect opportunity for me to create a different kind of narrative, moving away from the apocalyptic and disaster film, that could still allow us to engage the audience with the problem. Despite being a pivotal subject for framing the discourse around climate change, sustainable energy is rarely represented in films and even less is CO₂, which, whenever featured in the media, is usually portrayed as the 'enemy'. This was then a chance to try to transform a negative element into a positive one, in order to represent its possible benefits, according to scientific research. Andreoli and I seemed to agree immediately on the creation of a narrative about 'mitigation' and 'solutions', aspects which are rarely touched on in cl-fi narratives but are still part of the genre (Irr, 2017).

Due to the distance between Bangor and Swansea and our work commitments, the development of this narrative began with Skype video calls, regular phone calls and emails exchange. During our initial meeting on campus, Andreoli informed me that there could be an opportunity to obtain some funds for the film through an application for funding that he was already working on. However, if we were to apply for these, we needed to pay attention to 'impact' and justify why we would opt for the making of a fictional film instead of other forms. As chemist for engineering material often in the process of applying for research funding, Andreoli explained that one of the key ingredients for UK Government sponsored research is 'impact', and this includes communicating to both an expert and a lay public.

There are many ways of impacting with the research, beyond the 'academic impact' and the actual research, and reaching out to people, interacting with politicians, the commercialisation of what you do, they are all pathways to impact. But we followed a different route to reach a wider audience – I really think what we did was unusual. I've never seen anything like what we did anywhere, at least in my specific area of research. (Andreoli, appendix B)

Since the beginning, Andreoli realised that if we wanted to stand out with this project we needed to go beyond the research undertaken in his laboratory and avoid a simple case of documenting ESRI's work on site. According to Maynard and Shackley (2018), there has been a growing trend towards incorporating short, educational films as part of research funding for projects that involve researchers and developers in CO₂ capture and storage in order to communicate the outcomes of their research. Thus, while filmmakers clearly benefit from

collaborating with scientists, these collaborations also provide the scientific community with an alternative way for disseminating their research and other activities related to the institutions they work for (Kirby, 2013: 19). Andreoli reported some previous experience in the organization of events to show his research findings and process in alternative ways:

In academia you eventually have to communicate your research to people and it is common to have outreach activities to do that. For example, during the Swansea Science Festival or the Oriel Science Festival we have a booth where we take the public to experience the idea of transforming carbon dioxide, going around tables and doing the chemistry and explaining it to them. [...] It's extremely important, you have to know what you are doing and do it well during that event. But it is very standard, and I hoped there was the chance to do something unique, exactly what we did with the film. But before I met you I didn't know what to do. I wanted to do something different to reach a wider public, but I didn't know how. (Andreoli, appendix B)

Scientists and scientific institutions frequently find that the popular medium of film is one of the most affective ways to control their image and to convince the public that a research field (or a scientific subject) needs more political, financial and scientific attention (Kirby, 2013: 169). Thus, Andreoli and I decided to concentrate on the production of a short fictional film that could be used as an 'ice-breaker' for Andreoli to engage his audience during conferences, where he would usually present technical information and numeral data. The audience that we kept in mind when making the film were investors, scientists and policy-maker - people who already have a knowledge of issues about low-carbon energy. However, this did not exclude the general audience, which remains very important for my study.

Research in cognitive psychology claim that messages coming from film narratives have the power to influence beliefs about social and environmental issues within social, governmental and scientific groups (Slater and Rouner, 2002). Whilst research into audience reception of cli-fi films tends not to distinguish the impact on different kind of audiences, a set of studies concludes that a production such as *The Day After Tomorrow* can affect the viewers' response to climate change (Leiserowitz, 2004; Lowe et al. 2006). Compared with expository communicative forms (e.g. documentaries, graphs and statistics), fictional narratives can captivate the audience and provide motivation to continue the story until a resolution is reached. Among their many benefits, films can be particularly functional if used to engage members of the audience who have little interest in learning new information (e.g. adolescents, sceptics) (Downs, 2014). From this perspective, the fictional film narrative would serve Andreoli and I to attract both an expert and a lay public.

In the months following our first meeting at Bangor University, Andreoli and I had several online meetings to define our rationale for choosing to produce a fictional narrative that could be used in our application for funding that is addressed to science research. Following my research to that point, I proposed that social cognitive theories such as the *Elaboration-likelihood Model* (Slater and Rouner, 2002), *Entertainment-Persuasion* (Moyer-Guse', 2008) would help support our claims about the potential for 'impact' of our future short film. This set of research asserts that through *enjoyment*, *transportation* and *identification*, fictional films can engage the audience by triggering emotions that can lead to action and behavioural change. Thus, while spectators are immersed in the fictional narrative, they are less motivated to counter-argue with what is presented to them, leaving a better chance to enhance persuasive effects. Moreover, when the experience of watching the film has been particularly enjoyable, the narrative can reinforce memory traces for a better recall and application of the message(s) overtime (Green et al., 2004; Downs, 2014).

With our rationale defined, Andreoli included the proposal for our project as part of a larger application for funding which he had started with the *UK Engineering and Physical Sciences Research Council* in order to sustain the costs of production of our film (Grant ref: EPSRC: EP/N009525/1. Polymer-promoted Cu-catalysed conversion of CO₂ to CH₄). In the application, Dr Andreoli clearly specified that it was his intention to produce a short film that would deal with 'climate change' and 'carbon dioxide', and named me as the leader for the making of this film, due to my expertise (Andreoli, appendix B). In a sense, the proposal represented our premise for the screenplay and the future film. According to Parker, the word premise incorporates both the notion of 'an idea' and 'a proposal', and in screenwriting this is usually "a short, one to three sentence statement, which captures the essential elements of the screenplay" (Parker, 1999: 41). The aim of our premise, as it is often the case in screenwriting, was to reassure the reader/funder that the idea has a screen potential and highlight the original element in the project. In the application our short premise expanded to a short treatment that, similarly to Thorne's and Obst's initial treatment, was mainly based on science and included very little information about the story. As the next session in this chapter will discuss, the premise for the film changed several times throughout our development process.

Another opportunity for funding came from a conference where Andreoli had a chance to talk to the head of the *Welsh National Research Network in Advanced Engineering and Materials* (NRN) at Swansea, who at that time was very much willing to find a way to invest money in a project "that wasn't available anywhere else" (Andreoli, appendix B). Andreoli presented the funder with the same premise we included in the application and wrote an email

where we specified what we needed for the production of the future film. Fearful of what kind of sum would be appropriate to ask to science research groups such EPSRC and NRN for a project involving filmmaking, we budgeted for a very small amount, an amount that later I would find not sufficient for sustaining the costs of our production. However, we were successful in receiving the amount we requested, and during summer 2015 we were awarded £600 from EPSRC and £1006 from NRN. According to Andreoli, receiving such an amount for a creative project from science research networks was still to be considered a big achievement, as he generally finds the science research council are reluctant to devote money to artistic projects, at least when it comes to engineering (Andreoli, appendix B).

Once the funds were secured at the end of the summer 2015, we started with a series of brainstorming sessions through Skype and phone calls in order to come up with more advanced ideas for the story. During these meetings, we spent a significant amount of time discussing the message(s) we wished to disseminate through the story and the reaction we wanted from the audience. In particular, my desire was to move away from the apocalyptic-disaster narrative that is usually used to frame climate change and Andreoli was set on wanting to send a positive message about his work in CCUS. Research in climate change communication suggests that audience's engagement with climate change narratives can be more successful if we were to include positive messages rather than adopting a strategy of fearmongering. "Although shocking, catastrophic, and large-scale representations of climate change may well act as an initial hook for people's attention and concern, they clearly do not motivate a sense of personal engagement with the issue and indeed may act to trigger barriers to engagement such as 'denial'" (O'Neill and Nicholson-Cole, 2009: 376). According to cognitive psychology theories, fear appeals focus the attention on the threat, which can make the viewer feel overwhelmed and helpless. Such emotions can then disengage the audience and leave it with less cognitive processing capacity to continue absorbing the story and making sense of the information (Downs, 2014).

On the basis of such discussions, Andreoli and I began an exchange of ideas for the development of the story and the script. This is the moment where the development of the screen idea, as defined by Macdonald (2004), began. Despite the big commitment on both sides, to communicate these ideas to each other was not an easy process. I would share most of my thoughts through phone/video calls and emails but Andreoli often struggled to envision how the story would play out by incorporating the scientific concepts related to his research. In our follow-up interview, Andreoli explained: "the way I saw myself in that process was trying to imagine what you were putting on the table in terms of how it would look and how it

would correspond to what the expectation of the funders was”. With several preoccupations and limitations in mind, Andreoli and I put forward different creative ideas that linked to the principles of his research and that could satisfy the funders at the same time. The next section summarises our negotiations for the writing of the science into fictional story.

Negotiating and writing the science in pre-production stages

As it happens in the development of any new screen idea, the final outcome depends, at least initially, “on (1) the exercise of, and complex interplay of, personal power; (2) the extent to which ideologies are shared and specific discourses employed; (3) the extent to which the screen idea fits the framework or template being used; and (4) the extent to which the novelty of the idea is seen to be appropriate to the brief” (Macdonald, 2021: 13). As writer and director of this film I needed to individuate, in collaboration with the scientist, a narrative that could meet both our research goals and that could somehow link to the fundamental elements of Andreoli’s study: carbon capture, utilisation and storage. Although the brief in our application for funding provided a general premise for the creation of a narrative that deals with carbon dioxide and climate change, my conversations with Andreoli in the brainstorming sessions concentrated on more specific elements of his work. In particular, I refer to the production of advanced material and its key role for the catalyst and the success of this new kind of sustainable energy. Carbon Capture, Utilisation, and Storage (CCUS) is a collective array of technologies to avoid or remediate carbon dioxide (CO₂) emissions. According to Andreoli’s research, CCUS is necessary to tackle the global warming effect of CO₂ since renewable energy alone can only decrease or stop current emissions but not remove what has already been emitted. Essential to carbon capture are materials able to selectively and efficiently absorb CO₂ from gaseous mixtures, such as emissions from fossil fuel power plants, cement and steel factories, or air. Mature technologies originally developed to sweeten natural gas use aqueous mixtures of chemicals able to capture CO₂, however these chemicals pose technical hurdles (e.g. corrosion of equipment), and the water used makes the process energetically inefficient. For this reason, scientists are working to develop solid state materials with better energy performance and ease of use. Dr Andreoli’s work focuses on making amine-rich solid sorbents able to capture CO₂ from various sources including air. CO₂ sorbets are used in equipment which design needs to be engineered to maximise capacity. Referring to the concept of ‘carbon capture’, Andreoli and I discussed the possibility of a story which showed a boy sneakily going around his grandfather’s house looking for and gathering objects/material to build up what the

end of the film would reveal to be a small and basic energy system to create light. The child's grandfather would help him symbolically to illustrate the passage between old and new generation [engineering process], a concept that is behind Dr Andreoli's research. This idea was excluded as in the end we felt that there was a risk of creating a film that will look like an energy company advert. Moreover, according to Andreoli, it would have been pretentious to show the successful result of the child's experiment when, in fact, his research and end goal were still a work in progress.

Another aspect of Andreoli's research is 'carbon utilisation', or better, what to do after CO₂ has been captured and separated. CO₂ can be converted to useful products, some examples are alcohols (methanol, ethanol) and fuels (methane, ethane) that can be used with renewable energy. According to Andreoli, technologies for this are already available but they are not efficient enough to be commercially competitive (e.g. the cost of the products made from CO₂ is higher than the current benchmark mainly from petrochemical industry). Engineering work is underway to reduce these costs, while at the same time new approaches are being developed. Dr Andreoli's interest is in using electrochemistry to convert CO₂, water, and electricity are into added-value products. Instrumental to this are new catalyst materials able to facilitate the conversion by controlling the process at atomic and molecular level. Following these aspects, our second idea was to show the importance of using specific material to succeed in a certain practice. For this reason, we considered filming a sequence of fishermen at the harbour threading ropes while using old techniques, and then move through time to show how fishing evolved but somehow still remained attached to old principles and materials. Despite considering the potential of this narrative, also in terms of cinematography for creating more artistic shots, we scratched it from the list as Andreoli highlighted that fishing is considered at times a damaging practice for the environment, a practice that has devastated the marine flora and fauna. It was important to avoid any negative association with anything that could suggest the destruction of the environment.

Another idea for our story was built around the concept of 'recycling'. Dr Andreoli's research is based on the principle of capturing and using/re-using carbon dioxide that is artificially resealed (man-made) on our planet. We thought about showing how society could start reusing a usually negatively-labelled element such as carbon dioxide and try to make use of it with renewable energy. I then proposed a sequence of scenes that would portray the recycling of different objects/materials in an engaging way, such as a woman using leftovers from the fridge to cook a new meal. However, this idea was also discarded as, according to Andreoli, there could have been issues with the idea of re-using an element and had it still

‘exist’ in the world after its use. Dr Andreoli believes in the use of CO₂ with renewable energy but is also committed in finding ways to not release it back in the atmosphere. Therefore, a narrative on recycling could be contradictory to the principles of his work. Nonetheless, we continued to reflect on the concept of ‘carbon storage’ since this would play a key role in climate change control.

While carbon utilisation aims to valorise CO₂ in new products, carbon storage consists in the underground disposal of CO₂. Disposal is necessary since it is not feasible to utilise all emitted CO₂, mainly because there is no market large enough to absorb all resulting products. Storage is an expensive endeavour requiring transport to appropriate sites and injection in deep geological formation - another option is mineral storage where CO₂ is converted to carbonate salts. The Energy Safety Research Institute of Swansea University is currently working at an alternative and innovative approach to permanently store CO₂ in shale rock, and Dr Andreoli is directly involved in this venture aiming to capture enough CO₂ to fully decarbonise industrial emissions in the UK. Clearly CCUS is a complex scientific and engineering challenge, and essential to its success is the effective communication with stakeholders and the public since a large and strong support is necessary in view of the life changes and costs to be sustained in its deployment.

One way or another, possibly due to the complexity of the subject, the various ideas that I had been putting forward between autumn 2015 and the beginning of 2016 did not seem to satisfy Andreoli’s views of what this short film should be. The conversations over those months were heavily concentrated on the science and technicality and not much space was left for any of the stories to evolve. However, we arrived at the conclusion that to concentrate on the concept of ‘material’ was not allowing us to communicate what we wanted. We continued to keep carbon dioxide in mind as the centre of our story, but it did not seem to find the right space to be emphasised adequately through the aforementioned story lines. Furthermore, Andreoli was extremely worried that if we used a metaphor rather than the specific science to communicate his research we would somehow ‘break the promise’, and the promise, that were include in the application for funding. To avoid the disappointment of the funders was of primary importance for Andreoli. In our interview, Andreoli explained his point of view in regard to this stage of the development:

I was not concerned about what people would think. But when you apply for funding you set a list of what you deliver. And then they come and ask you where are these things you promised? [...] I was willing to deliver what I told them it would have been.

When I wrote the application, it was to communicate the importance of CO₂ catalysis – the transformation of CO₂ in the making of fuel. [...] If you are a film director, before they give you millions, you have to convince the investors of what it is. If it is just an idea, I don't think they will invest millions in an idea. However, here we are talking about 'nothing' in terms of money [compared to a Hollywood film production]. (Andreoli, appendix B)

Whilst I tried to remain *flexible* during this early stage of the development, anxiety was growing in terms of creativity as I was struggling to obtain what could be defined as creative licence within this particular context. There was an evident tension at this stage in my project, not only between the narrative I was trying to develop and the science, but also between my needs as a filmmaker and those of my collaborator as a scientist (Kirby, 2003): our ontological and epistemological beliefs were becoming an obstacle in the process (Kerrigan, 2018). As argued by Macdonald (2021), the creation of media can be seen as a 'negotiated struggle', as a 'bargain games', with creativity constrained within the work group. However, I was determined to respect the premise of our project, as listed in the application for funding, and to help Andreoli shift the attention from the specific science to the broader message, which was still about the need for sustainable energy to tackle the effects of global warming. In order to overcome this stall in the creative process, Andreoli and I had other meetings where, rather than discussing other options for the story, we looked at the core messages of the project to find some common grounds that would allow us to continue the collaboration. In the follow-up interview, looking back at this stage of the development, Andreoli said:

On my side, I was receiving these ideas that you elaborated, and I was constantly wondering what the public would understand of the work I do through the narrative. In the end, I realised that I would not want to tell them what kind of material I use and how I use it in the laboratory. There is no point. It's the impact we can have from using it that is important to tell. (Andreoli, appendix B)

Despite being completely satisfied with the short film that we delivered in the end, I must admit that at that point Andreoli's uncertainties about our project made me feel less confident in the role(s) I was playing in this project. The time was passing, the funds received by the research councils had to be spent within a year, and as a screenwriter and filmmaker I was feeling impatient to start this production. However, in Spring 2016, after several conversations, Andreoli and I switched the attention from his detailed work on the development of advanced

material to the broader concept of *sustainability*; it is at this point that our screen idea evolved and brought us closer to the final narrative for *Be Tradition*.

In April 2016, during a journey to Rome, I overheard a bride talking to her mother about wedding traditions in Italy and the idea of passing the wedding dress to the next generation. Still reflecting on the principles of *utilisation*, *storage* and *sustainability*, the conversation between the two ladies made me consider the use of *tradition* as a metaphor for *sustainability*. I contacted Andreoli to brainstorm this idea and hear his opinion. During that meeting we both reminded ourselves of our initial interest in using images of nature in order to frame his work through the visual narrative. In that moment, possibly influenced by my return from Italy, I started to think about a metaphor that could link agriculture, practice of growing vegetables in your own garden, and food tradition with the idea of energy production becoming not only *sustainable* but also part of our *tradition*. All this in relation to the bigger picture: climate change and how to deal with it. Among the several metaphors and allegories that I proposed during this collaboration, *food tradition* was the one that captured the scientist's attention straightaway. Andreoli agreed that if you overlap the notion of *sustainability* with *tradition* these two appear to be significantly connected. *Tradition*, like *sustainability*, involves a long-term commitment or a long-term action that survives over time. Moreover, *tradition* and *sustainability* usually suggest cognitive frames related to positive scenarios, optimisms and familiarity. Andreoli and I were aware that in some instance *tradition* can also have connotations of 'old-fashioned' and 'backward thinking'; however, we strongly believed that in our case we were using this concept for a positive association with science research.

After a year of brainstorming sessions and the final establishment of a metaphor for our narrative, it was time to write the script. At the end of May 2016, I intentionally took some time away from the meetings with my collaborator to immerse myself in the creative screenwriting practice without ulterior negotiations of the science. Despite the highly useful suggestions provided by Andreoli throughout the early phase of the development, I needed to take some level of control in the writing process and move forward with the making of the film, which included the complicated and time-consuming task of arranging a cast and crew for the shooting. At that point, we could not risk losing more time as the research funds needed to be spent within a certain date and we had to show the funders that the production was actually going ahead. Furthermore, with a limited budget of £1606 it soon became evident that to hire a crew that included a professional cinematographer, a production designer or an editor, would be very difficult. After some calculations, it was also clear that I could not afford a crew for more than a couple of days for the shooting – a factor that in part determined the length of the

screenplay and the film. With the realisation that I would certainly need extra support for the production of this short came the decision, in agreement with Andreoli, to write a story about food tradition set in Italy. In my hometown, Terracina, I would be able to film this with the support of a few friends who work in the television industry, and some family members who were willing to help for free.

Thus, after several drafts, I developed a screenplay that tells the story/evolution of a child's fascination with cooking and growing into adulthood where he becomes a chef. In terms of story, this film is a "rites of passage" (Parker, 1999: 79) using "desire for validation" as the theme (Parker, 1999: 92). The story, divided in three acts, spans a period from the 1970s to present day and carries some of the features of the coming-of-age genre. Like *Interstellar*, *Be Tradition* uses a fictional and speculative scenario for the communication of science, focusing on the human aspect of the story, the passage of time, and the importance of family. While in *Interstellar* a young Murph is inspired by her father, who sacrifices everything to save the Earth, and becomes an astrophysicist herself, in *Be tradition* the child protagonist is inspired by his grandmother to learn cooking techniques and use homegrown products. Act 1 of the film presents a child learning how to make pizza next to his grandmother, using products from their garden and utensils and pots which were handed down from generation to generation. In Act 2 the boy is now in his twenties and has improved his skills, but he is still in need of the support and validation from his grandmother while using his own technique. In Act 3, the protagonist is now fifty-years old and he is professional chef who grows his own vegetables and keeps the cooking tradition from his grandmother alive. At the same time, the scene reveals how his cooking techniques have evolved and improved.

The cooking tools that are visible on the kitchen table (e.g. the terracotta and hard ceramic bowls) were included to suggest the importance of using materials which can survive through time. The food products from the vegetable garden also link to the idea of sustainability, and the concept of energy is transferred through the cooking itself. An interesting association is the use of the tomatoes to represent CO₂. From a closer analysis, this fruit (sometimes considered a vegetable) remind us of the typical depiction of carbon dioxide as bubbles/spherical shaped elements. For a more detailed read of these story elements, a copy of the shooting script can be found in the appendix F. The following table shows the connection I made/used between Dr Andreoli's research and the key elements of the film:

MAIN CONCEPT	METAPHOR
Sustainability	Tradition
Energy use	Cooking
Engineering techniques	Cooking techniques
Evolution and development	Child growing up + skills development
Carbon Dioxide molecules	Tomatoes from vegetable garden
Advanced material	Ceramic and terracotta pots

Table 1: Main Concepts and Metaphors

As established in the early brainstorming sessions, Andreoli and I wanted to refrain from using specific images of science for our film. However, with our current use of a metaphor, a stronger link had to be made between our visuals and Andreoli's research in order to fulfil the terms of the project. Moreover, without the employment of iconic images of climate change (e.g. flooded towns, melting glaciers, drought), the audience might have struggled to make the connection between this narrative and the environmental issue. As the viewer will be aware, *Be Tradition* does not use dialogue and this choice was based on two main reasons. Firstly, the short film was conceived by Andreoli and I as a piece of media that could be played by as an 'ice-breaker' at the beginning of Andreoli's presentations during conferences. Secondly, due to the lack of funding, it was not possible to develop a longer piece with professional actors that could undertake a voice performance as well. In the end, we decided to use additional text that we wrote and added in post-production. The full text and details about the editing will be provided in the next section.

One stage of the script development which would have helped in the negotiation of ideas is pre-visualisation. Pre-visualisation is a stage of pre-production where steps are taken to visualise the script in a safe and cost-effect manner, prior to the production stage itself. At the high end, this can involve computer generated animations to visualise a complex battle sequence in a war film, or at a basic level, can be a series of storyboards to elucidate the beats of the script as shots on screen. There are various definitions of storyboard, but they all have in common the principle of visualising the images before is filmed. For example, the storyboard can be the "rendering in pencil or pen onto a series of panels to approximate what the

composition, angle, and movement within the frame will be for each shot”, which will serve to guide the rest of the production (Marx, 2007: 25). On the other hand, the storyboard can be “a collection of numbered static visualized images that represent pivotal film frames” (Selby, 2013: 75), and it can be valuable to solve some of the visual problems prior to the shooting. Although a near essential process in big budget productions, it is in actual fact common across all scales of filmmaking, and, in recent years, the popularity of this stage has even been used as a means to experiment with ideas prior to the initial scriptwriting stage. For examples, prior to the writing of *Star Wars: The Force Awakens*, Lucasfilm hired a group of concept artists to experiment with the iconography associated with the franchise and this led to an array of ideas that found their way into the script and later the film (Industrial Light & Magic, 2020). Given that the goal of a pre-visualisation stage is to experiment with and better communicate the ideas of the page in a form befitting the screen specific nature of the medium or even prior to the screenwriting process at all, it stands to reason that such a process would have helped bridge the gap that existed between Andreoli and myself in the early planning stages. Nonetheless, as discussed in the next section, a form of pre-visualisation was used by me and the editor to convey ideas for the combination of images and texts to Andreoli in post-production.

Embedding the science in production and post production stages

Once established that the short would be set and filmed in Italy, I began the organisation of the cast and the crew. Due to budget restrictions, I ask my family to help during the shooting of the film and I was very fortunate to have a few members to volunteer as actors: my cousin, Gabriel Cortese, who played the child learning how to cook; my grandmother, Pina Zannella, as the grandmother teaching the child how to cook; another cousin, Daniele Pestillo, who played the teenager improving his cooking skills; and finally my father, Angelo Cortese, in the role of the adult chef. As a matter of fact, this story was inspired by my father’s personal life. Growing up with his mother and grandmother, who were both cooks in their own bed and breakfast, my father has always had a passion for cooking. As a teenager, he studied to become a chef in a technical college in Wales and moved to Italy to realise his dream. Thus, our story about food tradition is also a story about family tradition. Other relatives and friends also volunteered to help during the production and their names are reported in the end credits. Make-up, costume and production designed, were assigned to Miss Maria Giulia Di Girolamo, an architect who also had previous experience working on set for the Discovery Real Time channel in Italy. A big help and support were also given to me during the shooting the director

of photography, Mr Paolo Simi, an expert of television and fashion photography, who previously worked for the TV programmes such as Masterchef Italia. Another key figure in this production was the screenwriter and editor Dr John Finnegan, who edited the final piece. The compensation that these experts received for their work on *Be Tradition* was lower than the industry standard rate. They were aware of the small budget available to this academic project and agreed to a smaller compensation from the beginning. It was also their way of supporting Andreoli's cause and research.

Overall, this production was an invaluable experience for Andreoli and I to understand the real costs of such project. If we were to commission this production to a company to which we had no links, as initially requested by the Swansea University, it would have been impossible to achieve the same results with our budget of £1606. Despite the support of the institution, the university's regulations for spending the funds represented an obstacle for the production of our creative project. The requirement in this situation is that those employed for a project within the university must be registered as sole traders or be recognised as a company in order to be paid for their work. Therefore, to pay an expert who might not be yet registered but might be willing to work at lower pay rate is something we could not rely on. In science projects the experts may need to buy materials or technologies that can be supplied by a registered company; however, this is not always the case with the arts. Initially, I made the mistake of thinking that these regulations were imposed by the research council awarding the funds. During a conference at Falmouth University in early 2017, Phil Parker, screenwriting scholar and funder/director of BCre8ive, explained that these problems usually derive from the way the university departments handle these funds and their regulations and not from the awarding body per se. According to Parker, who in that occasion was leading a presentation on academic and non-academic funding available to creative projects in the UK, if the department is not set to understand the needs of the film production this can become a complicated matter for a collaborative project between filmmakers and scientists.

Whilst the limitations we were facing, the shooting began in July 2016 in Terracina, Italy, where I was joined by the production designer from Rome and the cinematographer from Milan. We shot with a Canon 5D Mark III reflex camera and used additional lighting besides the natural day light. Most of the shots are clean and static, or with minimal movement so as to replicate a photographic style inspired by Burtysky's documentary *Manufactured Landscape* (Baichwal, 2008) in order to allow the audience to stay concentrated on the specific image. The choice of a photographic style was also due to a technical requirement: the movement had to be minimal in order to accommodate the integration of motion graphics that would carry the

text about the science. Thus, I framed certain shots with text in mind so that they could be composited afterwards. Many shots were intended for symbolism, following the elements listed in *Table 1*. For example, I made close-ups of the actors working the dough to put the focus on the idea of ‘technique’, or on the terracotta bowls and the cooking ingredients to focus on ‘material’. When the little boy is picking the tomatoes, the focus is on the fruit to re-evoked the round shape that culturally redirects to how we imagine the CO₂ molecules, often represented in education as a round shaped form or a circle. The lighting also subtly shifts between each act, ranging from morning to evening to symbolise the rites of passage. The Italian countryside was chosen as the main arena because of its links to old Italian traditions, as well as the environment and sustainability.

During the editing stage, Andreoli and I developed the text that would be overlaid onto the images with motion graphics techniques. This text went through several drafts since Andreoli was trying to be as specific as possible with the embedded message that would communicate the principles of his work. On the other hand, I was worried about readability and was attempting to phrase the text in a way that would make it easier for the audience to digest such information. This required the creation of short sentences that would each carry a specific meaning in relation to the images they were overlaid on. For this step, I printed out still images of our first draft of the edited video and wrote one short sentence under each key frame. In a sense, this is very similar to the process adopted in storyboarding, but prior to the film being shot. This is an alternative and an unusual way of working at the editing stage, but necessary at that point of our production. This is also proof that the scriptwriting stage is flexible and fluid and needs to be adapted to the demands and challenges of the specific production.

While we were trying to be authentic in the creation of the message, the text also included some speculations to balance Andreoli’s research findings at that time and the future of sustainable energy. As in the case of *Interstellar*, speculations were needed in order to enhance the original message. As put by Thorne (2014), such speculations were acceptable as they still sprang from the science studied by Andreoli. The following is the transcript of the final text that we agreed on, which opens with a sentence that encapsulates the essence of our project and introduces more specific reference to CO₂ as sustainable energy:

- Opening quote: The true sign of intelligence is not knowledge, but imagination. -Albert Einstein.
- CO₂ is what we have left from using fossil fuels.

- Imagine converting CO₂ to fuel
- through new materials and techniques
- which will last over time
- techniques that we can pass to the next generation
- for a new energy tradition to come alive.
- But to arrive at this destination we need to go back
- and rethink our practice.
- Imagine finding a sustainable material
- that will convert CO₂ through green energy
- into a fuel that will stand the test of time
- to protect our environment,
- to respect our climate
- and preserve our planet.
- CO₂ can help us create a truly sustainable world
- to guarantee sustainable energy production
- anywhere at any time,
- a new way for energy to last.
- Closing sentence: Be sustainable. Be tradition.

The film ends with the slogan “Be sustainable, be tradition”, as well as the research council’s logos and credits (YouTube link: <https://www.youtube.com/watch?v=GgBRYfW3CTg>). *Be Tradition* is clearly a work of fiction, but the motion graphics that overlay the images are also a documentary technique; this arguably would make *Be Tradition* a docu-drama. For the motion graphics, the editor used a clear font that reads well in the different lighting conditions of the footage and that will also be legible if the video is watched in different resolution settings. Another reason for the use of the text as motion graphics was our plan to distribute the film on social media, where short videos are generally presented with text or subtitles. Through phone calls, Andreoli and I had initially discussed the idea of using a voice over narration, ‘voice-of-god’, instead of text. However, as we were also imaging this short playing on a loop at fairs or science exhibitions, I believed that the text would remain more impressed in the audience mind than with audio - if watched in a crowded context. Andreoli was

concerned that without a voice narrating what was happening, the audience would not be able to grasp the meaning of our story.

The only way for me to test the usefulness of the motion graphics, was to ask the editor to produce a sample that we could show Andreoli. With the text, the editor also created reflection shadows and characters intersecting with the text, making the text an integral part of the scene. This, combined with the angling of the text to line up with the framing of the shot, created a stronger relationship between image and the text. In a couple of scenes, the line surprisingly appears and disappears as affected by the movement of the actor in the shot. These motion graphics were edited through 'Adobe After Effects' and the whole film was edited with the software 'Adobe Premier Pro'. After seeing the result of the first edit, Andreoli was satisfied with the result and understood where my decision was coming from. My goal was to produce a piece of media that Andreoli could present and play in different contexts while guaranteeing the audience's reception and understanding of the message. On this last point, we were in mutual agreement and of course, if in need, we could always add a narrating voice later. In the end, Andreoli decided not to have one.

In post-production, we also edited the colour of the images to black and white for Act 1, a slightly desaturated effect for Act 2, and a vibrant colour palette for Act 3. From this perspective, colour was another feature that we used to convey the passage of time. As a production team, Andreoli, the editor and myself kept in mind the need to keep the running length of the film short, as it was destined to be presented at conferences, lectures, art exhibitions and through social media. Research and statistics on attention span show that today the average length that people watch a single video online is less than two minutes (The Video Effect, 2020), whereas attention span during lectures is an average of ten minutes (Bradbury, 2016). In the end our short was cut for 3.45 minutes, excluding credits - an average between the aforementioned attention time lengths. There was little room to edit any further without compromising the narrative and the text and we did not want it to create a rushed pace.

The footage of this short film was also edited to match the rhythmic pacing of the music, which was essential in establishing an appropriate mood and tone. We opted for jazz music, which we believed would help reinforce the 'positivity' that the film is trying to transmit to the public. Due to copyright, it was important to use music that wouldn't add to the budget, therefore we used a score that was already in the public domain. The three pieces that we chose, which are also used to remark the beginning and end of each act, are: 'Minor Swing', 'Brazil' and 'I'll See You in my Dreams' by Django Reinhardt (Liberchies 1910 - Samois sur Seine 1953). From an aesthetic perspective, the non-diegetic music was chosen to convey a particular

sense of time and space. My choice was to use guitar jazz (also known as jazz-gypsy music) to recall ‘the old times’ and for framing a quiet-summer-day in Italy. Jazz is also very often associated with ‘cooking’, which made it the perfect candidate for the film. A narrative of tradition in association with such music possibly contributed to romanticising this *past* and *generations* that we were depicting in the film. As a matter of fact, music like Minor Swing has been often used in dramas and romances, such as the film *Chocolat* (Lasse Hallström, 2000). However, the inspiration for the music and the tone came primarily from a collection of works from the directors Woody Allen and Alexander Payne, who also favour jazz music. Overall, the short conveys a nostalgic tone and eases the viewer into the experience using a positive theme that is supported by neutral and light-hearted visuals through very clean shots. Further inspirations for this film also came from cooking shows, which have grown in popularity in recent years and exploit a nostalgic desire for homemade and traditional cooking techniques and healthy food.

Reflecting on the development of the screen idea for *Be Tradition* in retrospect, it is clear that although one tries to operate in a specific framework, “the process of screen idea development is not mechanistic or pre-determined” (Macdonald, 2021: 12). Even though this ‘collaborative act of construction’ is based around a shared set of values (Macdonald, 2021: 13), to communicate the screen idea in an interdisciplinary context adds more challenges to the process. In the case of our project, to secure a budget and space to create pre-visualization images or story-boarding, since the beginning, might have been beneficial to facilitate the communication (or sharing) of these ideas within the group. For example, to hire an artist for the creation of a storyboard could help Andreoli picture the story before the writing of the screenplay, and perhaps strengthen the pitch of some of my early ideas to the scientist. Unfortunately, in our case, the limited budget would have not allowed such step in the pre-production stage. On this point, Andreoli said:

The only way to communicate in this way is to visualise. If I was going to go for money like this again, I would definitely put in money to visualise. It’s the only way to really see where you are going. Honestly, I never knew because I had never been through it [the process] before. (Andreoli, appendix B)

Thus, the negotiations that occurred between me and Andreoli during the development of the script highlighted a need for pre-visualisation images not only after the script is written, as it generally happens in a pre-shooting stage, but also during earlier stages where the screen idea for a specific project is formed.

Since the film release in April 2017, Andreoli has presented our short in the UK and the USA in several contexts in front of expert and non-expert audiences. According to him, the short was praised for its creativity and accuracy in relation to his work by some of the viewers. Moreover, Andreoli reported that the funders of the project, NRN and EPSRC, were very pleased with the project and its result. At the end of our interview, I asked Andreoli if there was anything that he would have done differently looking back. The scientist remarked that he would have liked more time to engage in the creative process, but possibly with the use of pre-visualisation images. However, from my point of view, Andreoli had enormously contributed to the creative process. “A common public perception of the scientific process is that it is devoid of creativity or that creativity hinders practice built around objectivity. Yet, studies of scientific activity show that it is an incredibly creative process” (Kirby, 2013: 223). The work of scientists like Andreoli and Thorne requires to make connections between disparate strands of knowledge and elements, which requires both creativity and imagination. As I suggested this to Andreoli, he stated:

Mine [the process of imagination] is in the habit of seeing the atoms moving. You need creativity and imagination, but it’s a different toolkit [for the making of a film]. Absolutely, you need imagination – because when you apply for ground-breaking projects, you need to visualise from a scientific point of view for things that don’t exist yet. But that’s different to *how you communicate* – it’s not visualising what you might think will happen in a container (Andreoli, appendix B).

In the end, one could argue that the filmmaker’s and the scientist’s skills complement each other in the story and script development process. “Speculation, synthesis, integration, and problem solving are all creative skills that filmmakers rely upon when they bring scientific experts into productions” (Kirby, 2013: 223). In turn, these characteristics allow the scientist to add plausibility to fictional stories and speculative scenarios that spring from science research – science that, as in the case of *Be Tradition* and *Interstellar*, led experts from different fields to start a collaboration that can potentially change people’s perception of the world.

Conclusion

The analysis of the development of the screen idea and the script for *Be tradition* allowed me to reflect on both the individual and collaborative contributions and challenges in the film production process. The generation of the screen idea for our short film began during my first meeting with Andreoli in 2015, when we discussed the possibility of collaborating on the

making of a short cli-fi that could deal with mitigations and solutions based on Andreoli's research in CCUS. As the first step into the development of the script we wrote a premise and a short synopsis that were tailored to pitch our idea for a film as part of an application for funding with science research councils. Through video calls and emails, Andreoli and I exchanged ideas that were mostly aimed at finding the right premise that could convince the science funding bodies to invest in an artistic project, something that, as Andreoli stated, is unusual in his field of research. Therefore, similarly to what happened with *Interstellar*, the development of the script for *Be Tradition* began with the writing of documents that were based on the science that would be included in the future screenplay. In other words, in this early stage the scientist and I were mainly focused on finding a suitable story to which we could embed Andreoli's science research. Thus, at this point, the science was dictating what the character's journey should be: a different process from the one of having an existing screenplay in an established film production where the scientist is brought in as a consultant to enhance the plausibility and authenticity of the story.

While producers and filmmakers would typically worry about the future performance of the film at the box office, for the academic production of *Be Tradition* Andreoli and I concentrated on the impact factor that characterises most research funding applications. Therefore, it can be claimed that the early-stage development of the screen idea for *Be Tradition* was affected not only by the specific science but also by the assessment of the future research impact and budget. The initial lack of a clear idea for the story, along with a fear of what would be appropriate and safe to ask in terms of funds to a science research council for the making of a fiction film, also led us to lower the costs of our production, which in turn affected the following development of the script. Nonetheless, once the funds were awarded to us through Swansea University, Andreoli and I organised a series of brainstorming sessions to proceed with the next step in the development of the screen idea.

During these sessions, encouraged by the scientist, we concentrated on the discussion of the kind of message that our future film could potentially communicate to the audience. The various discussions about the production of the message were supported by climate change communication theories and concepts from cognitive psychology that helped us pin down the kind of narrative we wanted to construct. Based on these conversations, the premise and synopsis of our short cli-fi changed several times in the pre-production stage. Despite a big commitment on both sides, communicating our ideas for the screen to each other was not an easy task. Andreoli often struggled to envision how the story that I was proposing would play out once the science, based on his research principles, was embedded. On the other hand, I was

struggling to prioritise the science over the creative process. After spending a year between the application for funding and brainstorming sessions about the science and the message for our cli-fi, we still could not agree on a synopsis that would allow me to initiate the writing of the screenplay.

Following the analysis presented in this chapter it can be observed that in the pre-production stage of *Be Tradition*, the role of the scientist and the collaborative process undertaken for the inclusion of the science in a fictional narrative represented an obstacle for the creative process. The scientist's work and opinion were essential to begin the development of the screen idea and the message for the film, but there is a point in the production where discourses on authenticity and scientific concepts need to leave space for creative development as well. Thus, my analysis of this process shows that the dichotomy between the scientist's and the filmmaker's ontological and epistemological beliefs can significantly slow down the script development process. This is not to say that the reason for the delays in commencing the writing of the screenplay for *Be Tradition* is to be solely attributed to mine and my collaborator's differences. Interdisciplinary collaborations are a true challenge and, in our case, the communication of the screen idea in the pre-production stage might have been facilitated by the production of other supporting documents such as story-boarding or pre-visualisation images, which unfortunately we could not afford at that point.

One of Andreoli's main concerns during the development of the script was that our future film and the embedded science should remain faithful to what we promised in the funding application. In other words, the scientist wanted to make sure that we presented the specific science that was part of his research in order to avoid problems with the funding bodies. The focus on the specific elements of Andreoli's work was not helping us to advance in the development of the script but the project changed when we shifted our attention to the wider message regarding his work and took into consideration the use of metaphors. Although this may seem the obvious and natural approach to the development of any story, to place the emphasis on scientific concepts and techniques first causes an inevitable delay with the kind of work and reflections that are expected from the creative process.

Thus, the making of *Be Tradition* shows that rhetorical tropes such as the metaphor can help the practitioner/communicator to frame discourses on climate change and embed more specific science into the fictional film narrative. In the end we elided the concept of sustainability, the goal and principle of Andreoli's research, with one of food tradition to suggest that these new energy technologies should last over time. However, the writing of the screenplay for this short cli-fi involved the writing of additional text in post-production to

create a specific link between the metaphor and the science behind it. The writing of this additional text, presented in the short though motion graphics, were an integral part of the script development process and an enhancement of the screen idea. The pre-visualization of the footage from the first edit of the film helped us to develop this new text in which Andreoli injected information about his work, the science, and most of all some speculations about the future benefits of his specific research on CO₂ as fuel for sustainable energy. Therefore, as in the case of *Interstellar*, the writing of speculations coming from existing science were needed for the creation of the fictional narrative.

While Andreoli concentrated on the embedding of the science, I focused on the readability of the text for the audience. Specifically looking at the writing process of this additional text, I adopted a story-boarding technique where I printed still images of the film and experimented with the writing of each sentence under each image. Thus, the specific science that led us to the writing of the screenplay was in turn re-adapted in post-production following the pre-visualisation footage. This proves that script development is a flexible process that transcends the specific production stages and is adapted to the demands of the specific film project. Editing choices in relation to colour and music, which were made to emphasise the passage of time for the character's journey and the tone of the story, in the case of *Be Tradition* could also be considered an extension of the development of the script.

Reflecting in retrospect about the development stages in the making of *Be Tradition*, I believe that, as in the case of Thorne in the production of *Interstellar*, Andreoli had implicitly established some guidelines for the inclusion of the science in the script from the very beginning. On the other hand, I possibly struggled to lay out some guidelines in relation to the creative process, which often seemed to be overtaken by the science, especially during the pre-production stage. Perhaps a clearer agreement, a sort of contract, between the scientist and the filmmaker at the beginning of the academic project may help keep the balance between the creative process and the work needed for the embedding of the science. Both the scientist's and the filmmaker's voices are essential in the scriptwriting process, but it is always important to keep in mind the nature of the research output that is being created: in this case, the fictional film that aims to not only inform but also entertain.

The next chapter analyses the script development process of the environmental thriller *The Dead Cry Out*, where I also embraced the role of the climate change communication consultant. The collaboration in this project will present different production dynamics where the development of the story is prioritised over the inclusion of the science due to the different agendas of my collaborators.

CHAPTER 5

Writing the Environmental Thriller: the interdisciplinary approach in the script development of *The Dead Cry Out*

Introduction

The work undertaken for the production of *Be Tradition* allowed me to investigate several aspects of the script development process and, perhaps above all, it shed a light on the challenges of communicating the screen idea when collaborating in an interdisciplinary context. In February 2015 Andreoli and I embarked on a project that would allow us to develop a short cli-fi film, but it was only in post-production that the connection between the protagonist's journey, Andreoli's research principles, and the climate change issue was fully rendered. Thus, by observing the production dynamics of *Be Tradition*, it can be argued that the development of a script is not confined to the pre-production stage. After mutually agreeing on a premise, I proceeded with the writing of the screenplay without Andreoli's input. Nonetheless, Andreoli's involvement in the writing of the additional motion-graphic text arguably made the scientist an active player in the development of the overall script for this production. However, despite the invaluable knowledge gained from making *Be Tradition*, the creative and technical limitations posed by this specific project provided little opportunity for me to experiment with the writing/incorporation of the impacts of climate change in a fictional scenario. In order to investigate the different ways in which such elements can be embedded in a script, in 2017 I directed my practice-led research towards the writing of a new feature-length screenplay, the environmental thriller *The Dead Cry Out* (2019).

The Dead Cry Out is the story of a student, Amanda Devlin, who visits a remote Irish island in search of her estranged brother-in-law, only to discover that the God-fearing community may be behind his disappearance in order to protect a dark secret about their home. *The Dead Cry Out* was produced as a podcast series in 2019 by *The Script Department Ltd* and the script reading was performed by the actor Allen Leech (*Downton Abbey*, *Bohemian Rhapsody*, *The Imitation Game*). In 2021, the series was also featured on *BBC Sounds*. The reader can access the podcast through the following link: <https://www.thescriptdepartment.net/thedeadcryout>. This chapter provides an analysis of the writing of the screenplay for *The Dead Cry Out* prior to its release as a podcast since these

further stages of production and distribution were not part of the research undertaken for this thesis. The exegesis in this chapter will specifically refer to Draft 4 of the screenplay, which can be found in appendix E. The screenplay for *The Dead Cry Out* is the output of my collaboration with the screenwriter Dr John Finnegan, Senior Lecturer at Falmouth University, and the filmmaker Oisín Mac Coille, film and television director in the Irish industry. As in the previous chapters, my analysis will be supported by quotes from interviews with my collaborators about their experience in this project. These interviews were conducted at the end of the research process in February 2019 and can be found in appendices C and D.

For this project, I positioned myself not only as a co-writer but also as the climate-change-communication expert who would advise on the creative realisation of the endangered community and the looming environmental disaster on the fictional island, with an eye towards creating an authentic representation of the environmental problems and the risks. The script development process of *The Dead Cry Out* was primarily experimental although, as the chapter will discuss, it followed most of the conventions of the film industry – in this case implemented by the role of Finnegan and Mac Coille in the production. The first section of this chapter shows the generation of the screen idea for *The Dead Cry Out* and how climate change and the science struggled to find their place in the initial structure and treatment of the story. While Thorne’s and Andreoli’s interest was to promote scientific research through a fictional film, this time my collaborators had a different agenda, one that belongs to the entertainment industry.

Although committed to constructing a narrative that deals with climate change, in this project Finnegan was concentrating on “telling a good story” first and foremost, whereas Mac Coille’s focus was on how we could attract production companies to this project. As co-writer, Finnegan was less interested in the logistics of filmmaking, so Mac Coille was the voice that pushed for a story that could be filmed within a certain budget, in order to increase the chances of finding a producer that would help us to secure funds for the future film. On the other hand, as narrated through the three sections of this chapter, placed in the middle of this collaborative process, I was concerned with identifying ways for writing climate change and its impact on a fictional community through the visual language of the screenplay. In the end, this chapter shows that in the collaborative development of a cli-fi negotiations for creativity and authenticity are necessary and inevitable for the inclusion of the science and these have a significant impact on the screenwriting process.

Embedding the environmental disaster in early-stage script development

In July 2017 Finnegan approached me to discuss an idea for a film that he had had for a few years about a couple who goes to the West of Ireland to track down their ancestors. On this island, there is a Banshee character terrorising the location and it will turn out that the town and the surrounding environment are the real antagonistic element. Knowing that I was planning to write a second project for my research, Finnegan asked me if I would have liked to collaborate in the development of his screen idea, specifically helping with the creation of the world. Finnegan and I met at Bangor University in 2014 while he was too working on his research, which focused on how new technologies and market demands have an effect on the screenwriting process (Finnegan, 2018). Between 2015 and 2016, Finnegan occasionally brought me in as a consultant while he was developing the screenplay for *At the Crossing* (2019), a narrative about the struggles of a family living in small rural community ravaged by radioactive fallout. The story was originally set in Ukraine with specific reference to the Chernobyl disaster (1986) but, as Finnegan experimented in adapting the screenplay to the demands of the industry, ultimately all the specific references to the Chernobyl disaster disappeared from the script. In his PhD thesis Finnegan discusses that the elimination of the descriptions of Chernobyl as the specific setting of his story would provide more opportunities to produce the film in other locations (Finnegan, 2018). In other words, these changes would leave more space to re-adapt the story depending on the producers' demands. In the end, *At the Crossing* became an allegory for the what is happening in different communities around the world rather than being a depiction of people's lives during the aftermath of that specific catastrophe. The need for the filmmaker/screenwriter to shift from specific depictions/information to a more general representations for the script is a step that my research also identified in the case study of *Interstellar* and the production of *Be Tradition*.

Although inspired by similar observations coming from our research, Finnegan and I were at two different stages in our careers when we began to collaborate on what became *The Dead Cry Out*. Finnegan had completed his doctoral thesis and was now looking to write a feature-length film following his research interest in identification studies, placing emphasis on the development of strong female characters. In my case, I was still half way into my research and wished to write a narrative that depicted the unfolding of an environmental disaster related to climate change and its effects on the different members of the community. Moreover, I wanted to narrate the attempts of the citizens to overcome such environmental issue while dealing with a corrupted 'ruling class'. Finnegan's reciprocal interest in telling

stories about struggling communities is ultimately what united us towards the common goal: to write a story where we could show the reactions of the citizens in front of an apparently natural disaster.

During our initial brainstorming sessions between July and August 2017, I suggested that the protagonist should be an American PhD student researching history in Ireland and their journey should be impacted by an environmental problem related to climate change. This was my preliminary idea to justify the protagonist's expertise in searching for the ancestors and to emphasise the role of the environment as the antagonist. Finnegan agreed with the idea and proposed that it should be a single female protagonist, rather than a couple, and should be looking for an artefact, rather than the ancestors. After exchanging ideas back and forth for a month or so, Finnegan wrote a two-page outline where he incorporated my suggestions. The outline is a shorter version of a treatment and these terms are often used interchangeably in the industry (Batty and Waldeback, 2019: 6). The outline usually focuses on story structure, the central protagonist(s) and antagonist(s), their motivations and the core active questions that lead the plot (Parker, 1999: 43). Finnegan began the development of the outline by using a '19 points' story map, a method for structuring stories that he privileges in his own teaching at Falmouth University. This specific map allows to establish a three-act structure, including world and tone, climaxes and turning points, but it also clearly shows *first* and *second* stories and their resolutions. Following this map, Finnegan 'bullet pointed' the story and then sent it to me so that I could expand on each of these points.

However, our initial outline was just a simple beginning, middle and end. At this stage, there was never any of the complex ideas or themes that we were exploring in the story – neither Irish history nor environmental aspects. Nonetheless, I was concerned about finding a way to fit the environmental issue in the synopsis and I was struggling to make *structure* my priority over the *theme*. On the contrary, from Finnegan's perspective, "we could not work on the environmental message, without having a story to work it into first" (Finnegan, appendix C). We had to work on having a solid structure, "otherwise, it'll be a poorly paced and structured story" (Finnegan, appendix C). This was definitely a different approach to script development compared to the process that Andreoli and I undertook at the beginning of our collaboration. The script development of *Be Tradition* began with the writing of a premise and synopsis that were mainly based on the science that would be incorporated in the future screenplay and film. However, with Finnegan we reached a compromise and focused on plot first. As it often happens in screenwriting collaborations, we are forced to "think deeply about the nature of working with others, and how to fulfil such practices in creative and productive

ways that serve the project in question, not the egos of those involved” (Batty and Waldeback, 2019: 136). Thus, for the benefit of the story and the future screenplay, I took a step back from the climate change subject and prepared my notes for the next phase of the development where I would find more space to include my ideas about the specific disaster affecting the fictional island.

Thus, at the end of summer 2017 we had an idea for an adventure film, a protagonist, an antagonist and a location where this could play out. We had a general idea for the character arc, and the structure was starting to reveal the protagonist’s *physical* and the *emotional* journey (Batty, 2010): overall, this was a solid base to start expanding the story and the script. Both our early version of the outline, which we have since presented as a synopsis, never mention the phrases *climate change* or *natural catastrophe*. Below, I report the latest version of the synopsis - very similar to the outline but mainly written for selling the story to the industry (Batty and Waldeback, 2019: 7) - as featured in our pitch bible (appendix G). This synopsis provides a summary of the plot for the reader and highlights the point that most closely relates to environmental disaster: the mysterious deaths of livestock on the remote island of Blackcross.

Synopsis

Amanda, an American historian living in Ireland, is tasked with travelling to an isolated and reclusive island, Blackcross, to find her missing brother-in-law, Nick, who disappeared while searching for a 500-year-old burial site.

On the bleak island, Amanda meets outsider Danny, who is investigating the mysterious deaths of livestock. They set out to find Nick, only to meet the anger of the islanders who resent their presence. Meanwhile, Amanda realises she is being followed by a teenage girl, Branna, who seems to be leaving clues for her. Livestock and islanders continue to disappear, and the islanders blame Branna, whom they believe to be embodying a centuries-old Banshee threat which haunts the island.

Amanda is haunted by dreams of her sister who recently drowned. As more people on the island disappear, the leader of the community, Gerard O’ Keefe, rallies the island against Branna. Amanda follows Branna’s clues and realises she is not dangerous, and Amanda protects her from the towns people. Amanda learns that Branna is a misunderstood outcast and that Gerard is using her to perpetuate old ideologies to keep the island in check.

The Islanders descend on Branna's father's farm and burn it in retaliation while Amanda realises that Danny is actually one of the islanders. He explains that he used the identity of a missing investigator to get close to Amanda and find the site. He attacks Amanda, but she escapes. In an exhausted state, she makes peace with her deceased sister.

Later, Amanda tracks Danny to the burial site which Nick was search for. Injured, he is left to the incoming tide and Amanda flees in search of Branna. Amanda then confronts Gerard O' Keefe, saves Branna and escapes the island. In Dublin, Branna settles into her new life with Amanda, and Amanda conceals the location of the burial site from her peers.

Coincidentally, a month after the beginning of our brainstorming sessions, the director Oisín Mac Coille, with whom Finnegan had previously worked in Ireland, emailed to ask if Finnegan had any horror or thriller projects that he was working on. We sent the outline to Mac Coille, not necessarily expecting him to like this particular project, but he immediately saw the opportunity to inject his knowledge about Ireland, its history, and some of its mythology into the story. Excited about this project, Mac Coille started to pitch new ideas for the characters' arcs, theme and tone. In that moment, the collaboration between the three of us begun. With the structure in place, we had room to expand the story into a treatment. The transition from the initial outline to the treatment is also the moment when we stopped working on this screen idea as an adventure 'B movie' and decided this was going to be an independent environmental thriller, and a film with a social message. According to Finnegan, "that would never have come about if we hadn't started out with the two-page synopsis [outline] and built up to the 15-page treatment. That treatment was a really detailed document – it was very clear what characters were doing and why. The story had found its place then" (Finnegan, appendix C).

As I discussed in case study of *Interstellar*, the treatment is a pivotal step in the screenwriting process, and for the *The Dead Cry Out* it also the stage where the environmental disaster started to be embedded in the narrative before we could develop it further in the script. The treatment represents a more detailed plan for the screenplay, compared to what is achieved with the outline, though not all practitioners use or write these documents for the same purpose. However, as in the case of Kip Thorne and Jonathan Nolan for *Interstellar*, the treatment was an important *site* for beginning the negotiation of the science for the future script of *The Dead Cry Out*. Another advantage of using the treatment, as it happened in our development process, is that it allows the writer to produce several drafts of the story and can help identify structural issues before committing to the script. For example, in our interview, Finnegan reminisced

that, “even though we had a very well written treatment” this document made us realised that we did not have enough scenes to make the target page count of 90-100 pages, the equivalent of 90-100 minutes on screen (Finnegan, appendix C).

During the writing of the treatment, I made one significant change for the story. Considering our initial *inciting incident*, I suggested to have our protagonist, Amanda, come to the island in search of her brother-in-law rather than just look for an artefact. I believed that it would have been easier for the audience to identify with a character who is investigating the disappearance of a family member rather than an artefact. Moreover, as Finnegan had established that Amanda’s sister died by suicide, I thought that searching for the brother-in-law would be another way to metaphorically look for her sister and try to save her this time. In the interview, Finnegan recalled that before I proposed this idea, “we didn’t have a [a strong enough] reason for her to go from location to location. Without that change, there was no reason for the audience to see the island as it is. We knew the places she needed to be and when, but we didn’t have a legitimate reason for her to go to these places” (Finnegan, appendix C). To have the protagonist follow her brother-in-law’s footsteps also enabled us to give more time to the climate change aspect when it came to write the screenplay, as the environment acquired a predominant role in the scenes dedicated to the investigation. We worked on the treatment between the end of August until October 2017, though we revisited this several times up to 2019. The final version of the treatment, as presented in the pitch bible (appendix G), is a 5-page condensed version of our initial treatment, which evolved into a *step outline*. The step-outline is a working document for the writer, never used to sell a story, that shows a detailed breakdown of each scene presented by a scene heading (Batty and Waldeback, 2019: 7).

While writing the treatment Finnegan and I often consulted with Mac Coille, who helped us identify some of the key events affecting the island, which came to be known as Blackcross, a darker spin on the abundance of Roman-Catholic inspired names in the region. The treatment included in the pitch bible presents such central events: the death of livestock, the activity of an old mining company, and the final devastating fire that destroys the island and forces its habitants to abandon it. The death of the livestock carried not just a symbolic function (they are, in a literal sense, the sacrificial lambs), but also a practical one for the plot: the loss gives the residents an indisputable reason for abandoning their homes later in the story. On the other hand, the inclusion of a mining company from the previous century was chosen to reinforce the prejudices of the islanders towards outsiders, particularly people like Amanda and her brother-in-law who have come looking to take from the island and bring change.

Though the three of us were happy with the establishment of these plot elements, in this early phase of the creation process I was again concerned about the fact that these events were neither explained nor had a particular reason to be happening. Moreover, at this stage, Mac Coille and Finnegan were concentrating in including some of the history of Ireland in the story, and the rural environment of the island was still only functioning as a background. As it happens in every collaboration, the writing of a script is a process that involves multiple voices, working for multiple agendas (Batty and Waldeback, 2019), but as this collaborative group expanded from two to three member, I was struggling to find my voice and fulfil my work as a writer and consultant for a cli-fi film. The challenge was set for me and my collaborators to find the balance between our needs as writers and filmmakers and my interest in developing a screenplay that can be a lesson on the impacts of climate change on our communities. However, the process shifted at the screenwriting stage. After 6 months of work, Finnegan and I, always considering Mac Coille's advice along the way, completed a first draft of *The Dead Cry Out*, an investigative thriller that depicts the horrors of environmental catastrophes and historical oppression of women.

Following our initial treatment, which was further developed as a step outline, Finnegan assigned a number of pages for the two of us to write. The step outline is used by screenwriters to provide a detailed indication of the major scenes for each act and combine them into functional sequences (Parker, 1999: 47). At the end of each writing section, we would share our pages and exchange feedback. Sometimes, we also sat together and worked simultaneously on specific scenes by using the screenwriting software FinalDraft. Most of my designated pages were the ones depicting the characters dealing with the environmental problems on the island plus the scenes that helped establishing the *world* and *themes*. We started writing the script in October 2017 with an eye towards having a draft to show to Mac Coille in late November, but all in it was about three months before we gave a first rough draft to the director. In the script development process Mac Coille played the role of the antagonist in several instances, similar to what we would expect from a producer. When asked to explain what his role was in this collaboration he stated:

I'd find holes in the story and I was no longer on yours and John's side. I was coming to it from a director's point of view and sometimes I probably wore the wrong hat – coming to it as a producer and thinking 'how would we do this'. 'Could we simplify this to make it cheaper?'. What I should have done, I think, was to say: 'let's get the story as tight as we can no matter what the budget and when we get the right producer, they can worry about that'. But my role in this collaboration is that of director. So, I'm always thinking visually and about costs (Mac Coille, appendix D).

During the development process of every film production screenwriters find themselves facing changes and adjustments to the script in order to satisfy the demands of the director and the producer(s). Whilst our can be considered an ‘experimental’ screenwriting project, due to the freedom we had compared to the limitations that one would face if attached to a production company, with *The Dead Cry Out* Finnegan and I welcomed the director’s notes as these could be useful not only for the development of the present draft but also for the future film.

In January 2017, despite having written a functional draft that outlined the scenes in the film, I still had several doubts in regard to how the environmental issue was making its way into the script. The death of the livestock had become officially part of the plot, but we did not establish what specifically caused it and did not explain how this was affecting the community of Blackcross. Finnegan and Mac Coille, who were both interested in the writing of the history of the island as a way to refer to the broader history of Ireland, strongly wanted to include an old mining company from the 1800s in order to emphasise that ‘bad things’ have happened on this island for centuries. The now-abandoned mining company, seen primarily as an antagonistic element, would also serve for the protagonist to find old documents and maps that lead her to some key locations on the island; it was a way to give her, as well as the reader/viewer, information. Nonetheless, we had no reference to what linked the idea of the dead livestock, the mining company and climate change altogether. After giving Mac Coille some time to read the draft and provide his feedback, in Spring 2018 I requested a meeting among the three of us to discuss my concerns. We left our brainstorming session agreeing on the need to find some connections between the aforementioned elements of the story and we could see that there were still several plot points that needed further development, either through the characters’ physical and emotional journey or through aspects of the world.

Based on those notes, I decided to contact an expert in natural disasters, Dr Lynda Yorke, Senior Lecturer in Physical Geography at Bangor University, in order to begin research on what could connect those elements. I met Yorke in 2014 when I joined the *Network for the Study of Media and Persuasive Communication* at Bangor University, which includes experts in environmental science and risk communication. At the beginning of my studies, I also attended some of her classes about environmental hazards and climate change, where Yorke would encourage her students not only to study the science but also to reflect on the portrayal of environmental disasters through the media. Due to her expertise in geology and her approach to teaching, in May 2018 I asked Yorke if she would be available for a brainstorming session to help me identify what could be the cause for what we envisaged happening in our story.

Despite the fictional nature of our film, I was still determined to write authentic and plausible events that could affect real communities. At that point in the script development, I wanted to explain and justify the death of the animals in connection to the nineteenth-century mining activity on the island. Therefore, my two main questions to Yorke were: “can mining activities in the 1800s still have an impact on the environment to the point of killing livestock in the 21st century?” and “could climate change play a role in this?”.

Yorke started by discussing that mining activities from the 1800s are unlikely going to have an impact on the environment today, but that there are situations for which historic mining sites can still be a source of contamination to terrestrial and water environments. For example, old mines can be a source of water pollution today in situations where pollutants such as zinc, iron, cadmium, lead and copper have been deposited in river catchments through the years. According to Yorke, there are several locations in England and Wales where closed and abandoned mines are the cause of water pollution and numerous assessments from science and governmental bodies can be found on this problem. These reports discuss that heavy metals contamination of water caused by historic mines has had a big impact on soil and water quality, and on the health of plants, animals and humans. The increasing flooding events due to climate change have significantly contributed to bring back these toxic elements and contaminate the water surface. Yorke explanation of this problem led me to do further research into the matter.

According to UK Environment Agency’s science report by Hudson-Edwards et al. (November 2008), although metal discharges were greater during the peak period of active mining between the nineteenth and twentieth centuries, inputs of dissolved and particulate metals still occur today and are likely to be causing ecological damage. The Environmental Agency’s introduction to the 2008 science report states that “the re-suspension of highly contaminated sediments in lowland rivers during floods has the potential to cause additional harm to aquatic life, and to contaminate floodplain soils used for agriculture”. In this particular report, metal concentrations in floodplain soils affected by mining activities were measured against the government guidelines for grazing livestock on former metal mines. To summarise, this analysis showed that the amount of metal concentration in several river catchments significantly exceeded those guidelines. The same report concludes that “climate change is expected to increase the frequency and magnitude of floods, leading to increased re-suspension of sediments containing high metal concentrations, and therefore encouraging the transfer of contaminated sediments from river channels to floodplain soils that are used for agriculture” (Hudson-Edwards et al., 2008).

At the end of this short scientific research, I was finally able to provide a brief explanation of the environmental disaster that is affecting the characters and killing their livestock: a case of water pollution due to old mining activities and flooding that has been intensified by extreme weather events linked to climate change. However, I still had to find the best way to write this technical information in the script in a creative way. To be effective, science in movies should be fully integrated instead of being obvious (Kirby, 2013), but the path to achieving this is always turbulent in a writing collaboration where the parties involved need to become one voice for the script. Finnegan and I had several discussions on how we could use scientific terminology in the script for authenticity without compromising the fictional essence of our narrative. In particular, Finnegan was against the use of a scientific/technical vocabulary for the dialogue because he wanted the characters to be speaking in ways that were more natural for the tone and style of the story (Finnegan, appendix C). The purpose of dialogue is to establish the characters and their relationships in the fictional world, “where it is not just the words that carry meaning, but also who speaks them, when, to whom and how” (Batty and Waldeback, 2019: 80). In the case of our characters in this cli-fi, I believed that dialogue was also instrumental for them to exchange information about the disaster in order to help the audience follow the unfolding of the events. Therefore, I suggested that the protagonists should speak plainly about the issues affecting Blackcross by using a technical vocabulary when/if necessary and appropriate. The other reason for this suggestion was that, like in many scripts that deal with branches of science, dialogue can be useful to enhance the authenticity of the narrative (Moulton, 2019). In our interview, Finnegan remarked that he “didn’t want to sacrifice the integrity of the characters and the scenes only to get specific phrases across”, but that he could see my point of view when it came to certain scenes where Amanda was introduced to the problem on the island (Finnegan, appendix C). In the interview, I asked Mac Coille about his views on my desire to push for the inclusion of scientific facts and terminology in the script. He responded by emphasising the impact this could have on the audience with the future film:

It’s a discussion I’ve had with someone at work recently. If we get too bogged down in a factual viewpoint, we lose drama and entertainment elements. When people are going to see *The Dead Cry Out* in the cinema, they want to be entertained. The project in question was so heavily researched but it wasn’t drama or an entertainment piece. If we are getting too exact on elements in the story, we may lose some of our audience. Some, I’m sure, probably don’t believe climate change even exists. If we start adding too much information regarding these subjects, they may see it as a subliminal message to coax them into thinking this way. It’s not that your concerns aren’t valid, it’s about trying to

create a 90-minute entertainment piece and the audience needs to be able to draw conclusions themselves and go with it. It sounds like a cop out, but if they start questioning the story – ‘oh this happened then this wouldn’t happen’ – they start to lose the hyperreality side of the film (Mac Coille, appendix D).

Finnegan and Mac Coille’s attitudes to the writing seemed to mirror Christopher Nolan’s reflection on the making of *Interstellar*, when he stated that him and Jonathan always try not to be too “didactic” with the writing and avoid sending any particular message through the story in order to facilitate audience’s engagement (Sinha-Roy, 2014). Despite agreeing with Finnegan and Mac Coille to a significant extent, the short science research that I carried out with Yorke’s helped had certainly given us some new input and ideas to build some of the scenes and improve the authenticity of the environmental disaster in our story. The use of consultants and the research of non-fictional material to further boost the authenticity is a common practice in screenwriting, and screenwriting manuals sometime include section where they advise on how to proceed for contacting experts in a given field (Moulton, 2019). Thanks to the research, we were now able to explain what kind of environmental problem was affecting the island and that helped us shape some of the action, dialogue and world descriptions. In the interview, I also asked Finnegan how the development of the script changed, from his point of view, when he started to write with environmental problem in mind. Finnegan stated that, from his experience “to establish what the environmental issue on the island really was, and making it central to the story, helped fix many of the plot points” (Finnegan, appendix C). I argue that it is at this stage of the development, after writing the *first* rough draft, that the environmental-disaster aspect of the story became more central and the treasure-hunting element took a step back. The next section analyses stages of the re-writes of the first version of the script with references to most recent draft (appendix E).

Developing the environmental disaster and the characters of the fictional island

As we managed to rationalise the environmental problem affecting the island, and concurred that it wasn’t sufficiently explained, in the second draft Finnegan and I opted for an explicit conversation about the environmental problem between Amanda and her antagonist, Danny, who she initially believes to be an engineering geologist. In Act 1, when Amanda is exploring the island for the first (script: 19-20; scene: 22), Danny provides an explanation of the phenomenon and the “changing weather patterns” following Amanda’s questions (figure 1,2).

Amanda and Danny walk.

AMANDA

So how long have you been working here?

DANNY

Long enough. At first you couldn't keep people away. Everybody wanted to help solve the case and figure out what was killing the livestock. Then they realised it was coming from the old mines.

AMANDA

They poisoned the whole island?

DANNY

Not the mines, the floods are the problem.

(pointing)

See that stream --

Amanda eyes a stream of water flowing through the fields.

DANNY

That wasn't there yesterday. The changing weather patterns are bringing in more storms and all that water is going into the soil and bringing up zinc and cadmium and everything else that's down in those tunnels.

(CONTINUED)

Figure 1

Amanda follows the stream as it leads to a field populated by sheep.

DANNY

You get the picture?

AMANDA

Hence the bottles.

DANNY

This place is one storm away from becoming evacuated.

Figure 2

Thus, towards the end of Act 1 the extent of the environmental problem is clearly revealed to the audience as, after describing it in a technical way, Danny concludes that “the place is one storm away to be evacuated”. Despite these few specific lines of dialogue, where we intentionally avoided to use the phrase *climate change* to avoid a cliché, Finnegan and I had to compromise on the use of specific vocabulary by finding other ways to convey the *threat* on the island through action and world descriptions. We tried to inject elements that would suggest

an environmental hazard and the relation between weather events and water/pollution since the early scenes. For example, we described that as Amanda arrives on the island by boat, the priest, who was piloting the boat in extreme weather conditions, delivers crates of bottled water for the islanders (script: 10; scene: 9).

According to Finnegan, the bottled water would help us depict the idea of a poor community where a priest is tasked with bringing water supplies – a scenario that resonance NGO images that connect the problem of climate change to global poverty and social injustice (Manzo, 2010). From my perspective, including the bottled water was also necessary to convey how dangerous it would be to drink the fresh water on the island. To make this more explicit, I also added that when Amanda's settles in her room at the tavern, a placard on the bedside locker reads 'don't drink the tap water' (script: 15; scene: 14). Moreover, when Amanda is returning to the village after visiting the school, she sees a distressed woman coming from a barn. As Amanda approaches, the woman utters "uisce", the word for water in the Irish language, and her husband is visibly grieving. The scene follows with describing pools of water in the barn, inspired by the phenomenon of *flooding from groundwater*, very rarely depicted in films - perhaps because less visually dramatic than flooding from surface water - but a common problem in both urban and rural areas. *Groundwater flooding* occurs when the level of water within rock or soil that makes up the land surface rises. When the water table rises in urban areas reaching the ground level, the water can start climbing up through the floors rather than coming in through doors. However, this phenomenon can happen in different environmental conditions, including river valleys, and it usually occurs days or even weeks after heavy or prolonged rainfall (Environmental Agency, 2011). For this particular scene, I opted for the slower-paced type of flooding rather than a most common surface water flooding, typical of the 'floods/sea-level rise' category of cli-fi films (Svoboda, 2016), since I wanted to give the protagonist (and the audience) an opportunity to reflect on this *clue*, a piece of the puzzle, before we see the escalation of events following in Act 2. As the scene plays out, we reveal that the couple's horse, lying near the pools of water, is in fact dead (script: 26; scene: 37-38).

Another iconic scene that we wrote in order to connect water pollution to the weather events, is when Amanda tries to help some of the islanders rescue their animals in a heavily flooded field (script: 33-34; scene: 56). Somewhere on the island, a bank has burst, and the owners of this farm is about to lose everything. As Amanda looks around, she can see the surviving livestock being shot one by one by other islanders. It is an horrific massacre, but it said to be necessary to avoid keeping the animals suffering as they have drunk the water. Overwhelmed by what is happening around her, Amanda slips and falls underwater. Karen, the

only teacher on the island, runs towards Amanda and forces her to throw up the water she has accidentally ingested (script: 34; scene: 56). Extreme weather events connected to climate change also served in our story as obstacles in Amanda's investigation of the disappearance of her brother-in-law, Nick. Once arrived at the tavern where she is seeking shelter while on the island, the owner, Gerrard O'Keefe, tells Amanda that they are going to close up soon as the storm is threatening the power and it won't be possible to go out (script: 15; scene: 13). The day after, Amanda is discouraged from starting her investigation by Deirdre, Gerrard's wife, who informs her that the storm has caused a lot of damage across the island, supported by Danny who claims that the roads are flooded and will not be opened any time soon (script: 17; scene: 17). Moreover, the first time that Amanda decides to leave the island, there is no possibility to sail to the mainland due to the extreme weather condition; Amanda cannot escape (script: 32; scene: 51).

Overall, we used weather events and the flooding as antagonistic elements on Amanda's path, but the terror surrounding the island is also conveyed by scenes of the culling and the dead livestock. Finnegan established the horror from the beginning by having Amanda spot the first fire on the island from a distance while still on the boat (figure 3 - script: 9; scene: 7).

7	<p style="text-align: center;">CONTINUED:</p> <p style="text-align: center;">AMANDA</p> <p style="padding-left: 40px;">You don't look too confident yourself.</p> <p style="text-align: center;">PRIEST</p> <p style="padding-left: 40px;">It doesn't matter how long you've been on the water, you can never be sure you'll come home alive. The sea always wins.</p> <p style="padding-left: 40px;">THE ISLAND OF BLACKCROSS is revealed in the distance. THE ISLAND IS ILLUMINATED BY ORANGE MIST - FIRES.</p> <p style="text-align: center;">AMANDA</p> <p style="padding-left: 40px;">What is that?</p> <p style="text-align: center;">PRIEST</p> <p style="padding-left: 40px;">It's started again. The culling.</p> <p style="padding-left: 40px;">She takes out her SMARTPHONE and starts photographing the awesome sight.</p> <p style="padding-left: 40px;">The Priest pulls the zip of his coat all the way to conceal his collar.</p> <p style="padding-left: 40px;">Amanda is puzzled --</p>	9. 7
---	---	---------

Figure 3

The scenes dedicated to the burning of the animals at night, where the islanders wear scarfs to protect themselves from the fumes, are another important statement of the extent of the environmental disaster affecting Blackcross (script: 39; scene: 64). A few times in script, we

also highlighted that Amanda can hear excruciating sound of the livestock being killed. These specific scenes were conceived and developed by Finnegan, along with other important *chapters* of the story. The first scene of the script written by Finnegan embodies another important concept in relation to climate change. Amanda, the protagonist, arrives on the island on a boat from the mainland in a rough sea and the television news mention a refugee crisis, inspired by the idea of climate refugees (figure 4 - script: 1; scene: 1).

1	<p>INT. THE NICOLISA - NIGHT</p> <p>An old passenger ferry that has seen better days. The lights flicker as the cabin rocks from side to side on the Irish sea. Rain and waves pound the glass on the other side.</p> <p>A television mounted in the corner shows an Irish news broadcast - flickering images of A REFUGEE CRISIS elsewhere in the world. The signal fades and the image is lost.</p> <p>A young woman, AMANDA DEVLIN (30s), stares at her reflection in the window as it vanishes and reappears in the flickering moonlight. Like TWINS passing in dead space.</p> <p>Amanda notices a passenger, who we will come to know as DANNY (mid-late 30s), asleep and with EARPHONES in his ears.</p>	1
---	---	---

Figure 4

Finnegan and I agreed that having the news play in the background would be a subtle way to introduce not only the crisis but also the ending of the film: the islanders forced to leave their homes by boat. I first proposed the idea of portraying a picture of the climate refugee crisis for the resolution of the story in Act 3, but as we progressed with the writing Finnegan decided that this could become a pivotal aspect of our story and wanted to suggest the issue from the beginning. As it happened in the development of the other stories presented in this research, it is when we get closer to the human aspect of the environmental problem that the screenwriters can find a common interest for telling that story. Thus, in the script Finnegan added that, as Amanda approaches the island for the first time, she sees some distressed people standing in the rain with their possessions on their backs, hoping for a passage to the mainland (figure 5 – script: 10; scene: 9).

The wind on the island is vicious and dangerous. The storm is raging. Danny disappears into the darkness. Amanda waits in the rain.

She sees the Priest unpack the supplies for one of the men at the harbour. CRATES OF BOTTLED WATER.

At the shore, Amanda is taken aback by the sight of distressed islanders, including women and children, standing in the rain with their possessions on their backs, hoping for passage to the mainland.

Figure 5

As we developed Act 3, we decided that this sequence of images/descriptions that helped portray the beginning of Amanda's journey on Blackcross (i.e. the arrival on the boat, people looking to be rescued, the fire, and the bottle water), should also re-appear at the end of the screenplay for the resolution of the story in ac 3 (figure 3,4 - script: 98-99; scene: 165-167).

Islanders board the boat, their lives on their backs. Men, women and children.

Branna is spread out on the deck as Amanda gives CPR.

Karen watches with her son.

The boy with the shaved head watches, as do the other victims of the island. Victims just like Branna. They watch helplessly.

The Priest is speaking urgently on the radio.

Amanda loses hope. She leans back, unable to help any more. Crying.

She looks at the island as it grows more distant. Glowing red in-between the clouds.

On the shore of the cove, THE THREE MYSTERIOUS WOMEN, illuminated by lanterns and wailing for Branna.

And then suddenly Branna coughs.

Amanda helps the child to catch her breath again...

And then the relative safety of the Atlantic as it puts distance between them and the island.

Figure 6

166 EXT. CONNEMARA COAST - LATER 166
 Buses waiting. Police and Ambulances.
Flashing emergency lights.
 The priest is helping to dispense bottled water to the
 escapees.
 Amanda follows Branna as she is escorted onto the
 ambulance in a trolley.
 Amanda catches Karen and her son as they board a bus with
 the other DISPLACED REFUGEES. The teacher nods
 approvingly to Amanda.

167 INT. ISLAND - NIGHT 167
 The fields are lit up in flames, fuelled by the poison in
 the ground.

(CONTINUED)

Figure 7

167 CONTINUED: 99. 167
 The livestock are trapped and burn alive, despite the
 remaining islanders' attempt to put out the fires.
 Hell reclaims the island.

Figure 8

Overall, my construction of these aspects of the story have been inspired by a central debate that often accompanies discourses about environmental hazards: the natural catastrophe versus the man-made disaster. As in cases like hurricane Katrina destroying New Orleans in 2015, it is particularly the poorer inhabitants of badly planned areas who are “vulnerable to environmental hazards that can turn into disasters” and “disasters are especially prevalent in cities where emergency and response mechanisms are often too little and too late” (Benton-Short and Short, 2008, pp. 123, 124). This is the same for the disaster affecting the fictional rural community of Blackcross.

Disaster, in this definition, is the fatal combination of environmental forces on the one hand, and civic inadequacies and social inequalities on the other. The fact that poorer citizens are more likely to be victims of disaster than more affluent ones is what makes the effects of disaster a case of environmental injustice (Weik von Mossner, 2011: 153).

The story of the inhabitants of Blackcross could be considered a narrative of “environmentalism for the poor”, as defined by Weik von Mossner (2011) in a paper about the representation of

Katrina in Spike Lee's documentary *When the Levees Broke*. In contrast with a film such as *The Day After Tomorrow*, where the story is set in a wealthy New York, *The Dead Cry Out* uses a neorealist approach by having the story set in a poor community on a remote island. However, the kind of water pollution affecting Blackcross is something that both rural and urban communities experience in real life scenarios, and we do not need to look too far to spot areas that are severely affected by climate-related flooding. In contrast to films like *Interstellar*, for the *The Dead Cry Out* the story is set in the present and Finnegan and I decided to depict the effects of environmental disasters that are happening right now in the world. Today entire communities are displaced from their islands due to sea level rising, such as the case of the evacuation of the Carteret Islands in Papua New Guinea (Connell, 2016), and mining company have indeed affected the quality of the water in several parts of England and Wales (Hudson-Edwards et al., 2008). Nonetheless, as writers of fiction, we still worked on a speculative scenario and, as Yorke explained during our brainstorming session, it is unlikely that mining activities from the 1800s can impact the environment to that extent today.

In our interview, Finnegan claimed that with *The Dead Cry Out* he was trying to write “something that’s escapist but that slowly looks like something you know”. According to my co-writer, “we created a small localised problem that has happened before but at the same time it’s hyper real, so you are prepared to buy into it and let your guard down and go into this other world like someone is trying to preach at you” (Finnegan, appendix C). As argued in cognitive psychology research, the viewer is less likely to counter-argue the information and messages provided by a fictional narrative (Green & Brock, 2000; Slater & Rouner, 2002; Moyer-Guse, 2008), which makes the cli-fi a useful tool for the communication of climate change risks. Contrary to *Be tradition*, which was based on the idea that “fear won’t do it” (O’Neill and Nicholson-Cole, 2009), for the writing of the *The Dead Cry Out* I was inspired by Weik von Mossner’s (2012) discourse on *ecological cosmopolitanism*. The concept of *ecological cosmopolitanism* is based on Ulrich Beck’s theories of the *world risk society*, where ‘shared risks’ are able to connect humans across national boundaries. From this perspective, the fear of being affected by an environmental catastrophe is what will “lead people to understand that they must *either collaborate or perish*” (Weik von Mossner, 2012: 147). According to Beck (2009), it will not be our compassion or ethical concern that will encourage us to act, but rather the frightening knowledge of the future repercussions of environmental disasters on our society. In other words, as discussed by Weik von Mossner, the fear of climate refugees could be what pushes communities to prevent and solve these problems, before this wave of immigration can affect us.

Based on these theories and in line with the thriller genre, *fear of death* and *fear of the unknown* are the two main themes that Finnegan and I employed for the construction of our protagonist's journey. *Fear of death* as a theme in screenwriting theory relates to "the desire to see how people cope with the threat of death" (Parker, 1999: 92), a theme that characterises most horror stories. On the other hand, *fear of the unknown* relates to "the desire to see how the unknown can be confronted and dealt with" (Parker, 1999: 92), as typically happens with the thriller genre. As these themes are both important drivers of Amanda's journey, *The Dead Cry Out* resulted into a hybrid between the horror and the thriller. The point of going to see or read an environmental horror/thriller such as *The Dead Cry Out* is not about finding out whether the protagonists will survive or not - we know they probably will: it is about *how* they are going to. This is also the big question surrounding climate change: how is society going to solve this problem and save humanity from the 'apocalypse'? In our interview, Finnegan discussed that having a story about climate change told in the form of a thriller seemed a natural fit for him:

We are telling a story about ghosts on an island, but climate change is the real ghost that is haunting them [the characters]. But if we just had a ghost story on its own, it would not be a thriller. We emphasise the thriller element of the story by having actual people pursuing the protagonist, the fear of death is evident in every corner (Finnegan, appendix C).

During the writing of the second rough draft, I decided to call for another brainstorming session with Finnegan to discuss the functioning of Blackcross as a microcosm and allegory of other societies in the world. We had established what the environmental disaster was, but I also wanted to find a justification for how all this could possibly be happening in Western countries in the 21st century – in this case Ireland. The necessity to find "rational explanations for fantastic situations" is a common component in the filmmaking approach (Kirby, 2013: 145), but it could also represent an obstacle for the development of the story and the script. During the brainstorming session, I addressed three main questions: how is it possible that citizens on this island are deprived of help from the mainland? How is it possible that they are simply accepting that the environment and the livestock are dying in front of their eyes? Is it believable that in the 21st century there is no advanced technology used on the island (e.g. no internet, no computers or mobile phones)? – Could we somehow try to explain these dynamics? In the interview, I asked Finnegan about his recollection of that session and what were his thoughts about my approach to rationalise those aspects. Finnegan said:

I understood where you were coming from with those points. I also felt that if went too deep into trying to understand every facet of how [the world] came to be, [...] we would rob the imaginative possibilities of ‘how things happened’ [and of] the ‘happy accidents’ that can come from not having all the answers. You can ruin the mystique of it. Another reason was that if you try to explain it too much, you give the audience too much fuel to debunk the idea. The example I use is *Inception*. If Nolan explained the logistics of how things work in this world where people can steal each other’s dreams, if you really unpack it, it doesn’t make sense and it unravels. But the reason it works is because Nolan considers these aspects to be unimportant. We were certainly thinking on the right level and it had its benefits, but this was a concern that I had. I didn’t want to deprive ourselves of other things happening because we had pre-agreed that the characters were living by a specific set of rules. It wasn’t a case of being right or wrong, it was just a personal hesitation to go too deep into it (Finnegan, appendix C).

In the end, as for the previous steps in the script development process, it was a case of balancing and compromising as we build the elements and scenes that would explain the islanders’ beliefs, behaviour and responses to conflict and struggles. Represented in the screenplay through different characters, the dynamics in the community of Blackcross are an allegory of the different politics adopted in today’s societies when dealing with environmental issues. Some of the characters seem to struggle with the idea of *science and progress*, possibly refusing the truth, while others want to rebel against the *oppression of the ruling oligarchy*. In this case, the ruling oligarchy is represented by the O’Keefe family and their followers. On the other hand, Karen, the teacher, seem to be the voice of reason in a community that is significantly devoted to their religion and old-fashioned ways. For example, in one scene, we describe Amanda near the fort as she hears yelling from afar and sees a local man scolding a kid for dying his hair and approaches to help him (script: 23; scene: 31). The man is very violent towards the kid, who is subsequently forbidden from engaging in any conversation with Amanda ‘the outsider’, or he will be punished for it. In relation to the use of *technology*, Finnegan and I decided that it would be better not to have Amanda have access to any functioning device beside her phone, in order to portray an image of her trapped on the island, a prison where she does not have the tools to escape.

In addition to the lack of *technology*, the community of Blackcross does not seem to invest in *education*. There is only a tiny educational complex on the island, with few rooms altogether for the students of primary and secondary school. The library at the same place is unimpressive, and the viewer can tell that it is a place where reading is not held to a high standard (script: 24; scene: 33-34). In one occasion, while at the school, Amanda holds her phone to take some pictures of the place and the documents. In that moment, Karen grabs the

phone from her hand and looks to the window in apprehension telling Amanda that this kind of technology can get her in trouble around there (script: 26; scene: 36). Amanda's *anxiety* grows as she realises how dangerous the situation is for her and for some of the islanders in general. To further emphasise the protagonist's anxiety, I drew Amanda as a person suffering from *trypophobia* (script: 21; scene: 25), a fear of patterns and holes that holds her hostage in moments when she has to react in front of the danger. This fear makes it difficult for the people suffering from it to look at many patterns that are spontaneously produced by nature.

Finnegan and I decided that the meeting place to debate the politics on the island should be the church, since *religion* plays an important role in this story. The decision behind implementing a strong religious culture on the island was borne from both Finnegan's and my own upbringing in strong catholic countries where devotion to long-held principles often prevents progressive discourse and policymaking. It was felt that an underpinning mechanism was needed on the island that would prevent the characters from making, what audiences might consider, the logical choice of abandoning their home for a more prosperous life elsewhere. The existing associations between conservatism and climate-denial, particularly in pockets of The United States and Europe, presented us with a ready-made culture that the islanders could be situated in, one that the obstacles of Amanda's journey can stand on. While the views of the islanders are extreme in comparison to the Catholic influence in Ireland today, the notion of such a controlling religious community is not far-fetched. Our inspiration for the use of religion also came from the Netflix documentary *One of Us* (2017), which follows several former Hassidic Jews in New York as they try to break away from their particularly controlling community.

Half way through Act 2, the citizens gather at the church to discuss that there are only around twenty livestock remaining on Blackcross. One islander who is preaching to the people states that "it is time to call the mainland for help". Deirdre O'Keefe disagrees and tells everyone that they will be paying for this mistake. This is intended as a 'divine' punishment. In the meantime, livestock owners are committing suicide as they lose everything but the O'Keefes remain firm on the idea that no more outsiders should come to the island. (script: 35-36; scene: 57-58). After the meeting at the church, Karen reveals to Amanda that the O'Keefes have been going around telling everyone that this girl, Branna, is to be blamed for the death of the animals and most of the islanders decided to side with them. Branna, a teenage girl, is apparently responsible for killing some of the livestock. "They'd rather blame this girl than seek the truth", explains Karen. As a matter of fact, Branna is a troubled girl with severe disabilities due to the water poisoning and a difficult past.

Due to her ‘unusual’ and ‘unnatural’ behaviour towards the animals on the island, Branna has been used as the scapegoat by the O’Keefes to convince the islander that the issue on the island is due an evil force. At the church gathering, Karen tells Amanda that she tried to gather petitions to help pay for a scientist to come and evaluate the situation on the island but the islanders “wouldn’t hear of it” (script: 37; scene: 58). Through various scenes, I tried to portray the island as a society that is too scared of the consequences of changing the status quo – in this case, scared of risks of bringing outsiders on their territory. Giddens and Beck’s sociological theories on *risk* and the evolution of the *risk society*, were of guidance while developing the conflict in the aforementioned scenes. While in modern society, due to technological developments, we came to blame ourselves for issues such as man-made climate change, in pre-industrial societies extreme weather events and natural catastrophes were seen as an ‘act of god’ or as something to be blamed on supernatural forces (Giddens, 1990; Beck, 1992) - such as the ‘evil’ Branna. Giddens and Beck’s concepts of *manufactured risks* and *manufactured uncertainties* were naturally embedded into the story as Finnegan and I portrayed the protagonists’ journeys, their inner fears, the cultural aspects of the islands, the outside agents, and the community’s journey to self-destruction.

Besides developing plot points that show how the characters in the community experience the fear of death and fear of the unknown collectively, Finnegan and I developed a few scenes that are iconic of the pain that the backward thinking and dangerous behaviour of the community is inflicting on the individual character. For example, in Act 2 a woman from the farm finds Claire, Gerrard O’Keefe’s daughter, writhing in a pig pen. She has a tusked gossip’s bridle (first found by Amanda in the fort – script: 21; scene: 27) clamped to her face and her tongue is trapped in the device: it is her punishment for helping Amanda with her investigation around the island (script: 52; scene: 82). The Gossip’s bridle is an ancient artefact originated in the 1500s; there were different versions of this item throughout history, but they were essentially used on women. It was a punishment, a form of torture of public humiliation, for preventing people from speaking. In our story, at present, it is the symbol of a bigot society that has struggles to evolve. Even though one may not recognise this to be part of today’s Ireland, there are places in the world that still perform corporal punishment on people and it still seems to be accepted by such communities. The speculative scenarios, scientific and non, that Finnegan and I created for *The Dead Cry Out* demonstrate how the writing of fiction provides an opportunity to remind the audience of the dangers that we can face if action isn’t taken.

In *The Dead Cry Out*, the religious elements and the brutal behaviour adopted by some of the islanders are strictly related to long-held traditions in the community. While in *Be Tradition* I depicted the handing down of traditional cooking techniques in order to send a positive message and create a metaphor for renewable energy, in *The Dead Cry Out* the islanders' traditions are used to represent the negative and catastrophic impact that certain practices have had on the members of the community for centuries. Through Amanda's journey, Finnegan and I, with Mac Coille's help, also tried to narrate the history of women's oppression on the island of Backcross, which we also considered as a metaphor of the exploitation of the environment. At the beginning of the script, a flashback shows Amanda, a PhD student working as an associate lecturer, using old illustrations that depicts women drowning at the hand of Francis Drake during a lecture (script: 2; scene: 2). Amanda is an American studying abroad and when professor McCabe mentions the research on "the campaign of misinformation to unify the country against a common enemy" Amada calls it, in other words, "fake news" (script: 6; scene: 5). In addition to specific reference to women's oppression and old myths of a hidden treasure on Blackcross, the O'Keefes often remind Amanda how the people of this island were constantly exploited through history by 'outsiders', including the Sedona mining company (script: 27; scene: 39). To have the islanders provide historical facts and anecdotes to Amanda in our screenplay served to show that previous abuse and invasions of the island is what may have contributed to the community's disbeliefs towards getting any help from the mainland. As the readers/viewers might side with those islanders like Karen who are in favour of progress, they can also understand their resistance and reservations based on what history has taught them.

As demonstrated in this exegesis, the development of the cultural and environmental aspects/problems of a fictional world in a collaborative screenwriting process can pose several challenges that must be faced through an attentive selection and understanding of the topics that the group wishes to depict. Despite the differing views in the development of the screenplay for *The Dead Cry Out*, Finnegan, Mac Coille and I were very satisfied with what we achieved at the end of this script development process that, in our case, did not lead to the production of a film but rather the making of a podcast series where no significant changes were made to the script. We completed Draft 4 in July 2018, although in time we went back to revisit the script, particularly for the production of *The Dead Cry Out* as a podcast series. Compared to the more common cli-fi disaster movies, with *The Dead Cry Out*, as a writer and communicator, I tried to explore underlying fears and social behaviours that can be associated with climate change in the real world indirectly. Disaster films such as *The Day After*

Tomorrow (2004) and *Geostorm* (2017) tend to blatantly show us the disaster as it unfolds with the goal of entertaining the audience through a highly fictionalised narrative and expensive CGI. Contrary to these screen works, for *The Dead Cry Out* my collaborators and I concentrated on depicting the islanders' reactions and behaviours in response to an environmental catastrophe rather than showing it through elaborated images.

Similarly to films such as *Take Shelter* (2011), the natural disaster in *The Dead Cry Out* is slow-paced and remains in the background, as we use metaphors and alternative subjects to provide an innovative approach to the depiction of climate change in cinema and the imaginative challenges it poses (Woolley, 2014). We can find example of this kind of approach outside the cli-fi genre as well. For instance, an investigative thriller such as *Wind River* (2017) is not only about finding clues to discover who murdered a young woman in the tundra; it is about the injustice against the families of a large number of native American women who went missing and did not receive any help from the U.S. authorities to find them (dead or alive). But this is never revealed until the end. Productions like *Wind River* very subtly try to slip a social message into the narrative, stimulating the audience's interest to find out more about the problem after watching the film. This example is very close to what we have tried to achieve with *The Dead Cry Out*. In the end, if we consider the premise for *The Dead Cry Out*, as presented in the pitch bible and the podcast website, this is a story about a woman trying to find her brother-in law (appendix G):

Doctoral student, Amanda Devlin, visits a remote Irish island in search of her estranged brother-in-law, only to discover that the God-fearing community may be behind his disappearance in order to protect a dark secret about their home. The Islanders turn against Amanda, who must solve the mystery and escape the island.

Thus, the premise does not mention climate change nor an environmental catastrophe. Nonetheless, our hope is that by incorporating climate change into the broader context of the plot, rather than making it the focus of the story (Svoboda, 2016), our future film can deliver a more consistent message on climate change and the risks for small communities around the world.

Conclusion

In line with the other cases presented in this research, the analysis of the writing of *The Dead Cry Out* has shown that the embedding of scientific concepts in a cli-fi film narrative has a

significant impact on the script development process. In the early stages of the development, inspired by similar observations coming from our respective research, Finnegan and I began the collaboration with the idea of developing a narrative about an endangered community where the environment functioned as the antagonist. More specifically, our idea was to show the reactions of the citizens to a natural disaster related to climate change. In the first month of our collaboration we met regularly to discuss ideas about the creation of our female protagonist, her journey and story arc. The result of our initial brainstorming sessions was a two-page synopsis that focused on story structure and did not include any specific reference neither to climate change nor the kind of disaster affecting our protagonist's world. This was significantly different from the way I began the development with Andreoli as in that instance the content of our premise and synopsis was mostly the science that would be embedded in the future fictional film.

With the collaboration of the director Mac Coille, we expanded the synopsis to a detailed fifteen-page treatment where new ideas for the characters' arcs and themes were added. The treatment was a pivotal step in the development for the embedding of the environmental disaster in the story and, like in the case of *Interstellar*, it allowed us to commence the negotiations between scientific concepts and creative elements in the story and the script. At this stage, considering theories in audience identification, I made a significant change to the protagonist's goals: rather than going to the island to look for an artefact, she would now be looking for her brother-in-law. In this way, the audience could better identify with the protagonist's quest that will lead her to explore the environment differently. In the end, the treatment presented the central events that relate to the environmental disaster and affects the characters' journeys: the death of the livestock, the activities of an old mining company and the final devastating fire that forces the islanders to abandon their homes. Thus, the elements related to the environmental disaster were slowly integrated into the story before the writing of the screenplay.

As the co-writer, I was satisfied that these elements were making their way into the story, but I was concerned about the fact that this set of elements and events related to the natural catastrophe were neither explained nor had a specific reason to be happening in the narrative that we had developed at that point. I believed we needed a plausible explanation that could justify these events. On the other hand, my collaborators sustained that if we overly explained the events we may lose some of the audience's attention and give them more space to counter-argue our story and debunk the idea behind the environmental disaster. Nonetheless, during the meeting we agreed that I should do some more research about the possible

environmental disaster affecting the island and decided to contact the geologist Yorke. During a brainstorming session, the geologist helped me to identify what could be the environmental disaster in connection to the existing elements of the story and plot points. Thus, in this instance, the plot guided the selection of the scientific concepts that could fit in the story. At the same time, these scientific concepts also inspired some of the dialogue in the story and helped us fix some key plot points. Finnegan and I had several discussions on the use of a technical/scientific vocabulary in the dialogue since he preferred that the characters spoke in a way that was natural to them. On the other hand, I believed that the use of specific information in the dialogue would help the audience make sense of the environmental issue affecting Blackcross and the behaviour of the islanders. Our different approach to the writing required compromises on both sides for the realisation of these specific lines of dialogue.

Whilst the need of writing authentic and plausible scenarios that justify the extreme weather events and the natural disaster looming on the island, the scenarios proposed by the geologist in support of my story became mostly speculations. Although the activity of mining companies from the 1800s could still have an effect on the environment today, it is unlikely that these activities would lead to such catastrophe – or to a situation where the islanders should abandon their homes. The fire, on the other hand, helped us create this end for our characters. This aspect of the process demonstrates what was already evident in the case of *Interstellar* and *Be Tradition*: in the interdisciplinary-collaborative development of a script, the creation of speculative scenarios for the incorporation of scientific concepts is necessary and inevitable. Nonetheless, the authenticity of the screenplay and film remains if we consider the integrity of the process through which these scenarios were created.

The threat of the environmental disaster, which was fully developed in the draft of the screenplay, was not only conveyed by the dialogue but also through action and world descriptions. In the screenplay we described images that evoke the same visuals used by the media for the communication of the impacts of climate change. We also describe scenarios that may remind the audience of images from NGO campaigns in connection to climate change, global poverty and social and environmental injustice. Other scenes were inspired by climate science, such as the phenomenon of the storm and the flooding that devastate the island. In the scenes that show the culling, we portray people wearing scarfs and masks to protect themselves from the fumes – an important statement of the extent of the disaster but also an image that might evoke visuals of the fires due to rising temperature around the world. The writing/construction of the different behaviours among members of the community of Blackcross was also inspired by a debate that often accompanies discourse on climate change:

the natural catastrophe versus the man-made disaster. While certain subjects and themes were the reasons for a dispute between me and my collaborators, one element we agreed on was the representation of the climate refugee crisis (showed through the TV news images on the boat and by the islanders' actions), proving that when we get closer to the human aspect of the environmental catastrophe the screenwriter and the consultant find a common ground in the development of the story.

In contrast with a cli-fi like *Interstellar*, our story is set in present-day to suggest that these environmental disasters and crises are happening right now in the world. We used a neorealist approach setting the story in a poor rural community on a remote island. Though this can be similar to the idea of the rural community in *Interstellar*, *The Dead Cry Out* does not present the story through technology or technological advancement. However, the hyperreality of the events on the island and the fictional nature can help the audience let their guard down as they absorb the plot provided by the fictional narrative while still absorbing the information about the disaster through transportation and identification. The development of the screenwriting themes 'fear of death' and 'fear of the unknown' were also inspired and informed by sociological theories on risk, such as the concept of risk society, ecological cosmopolitanism, and manufactured risks and uncertainties, as conceived by Beck and Giddens. Thus, it can be argued that in the writing of the cli-fi, the screenwriter and the science expert not only consider notions of climate science, but they can also draw ideas from social theories and research that goes beyond the specific science. Subsequently, these new ideas coming from the research will be integrated into the characters' action, the dialogue, and the world descriptions.

Overall, the development of a screenplay such as *The Dead Cry Out* reveals the will of the writers to resort to speculations that can help create an allegory for what is happening right now around the world in relation to the climate crisis. In my case, since I was functioning as a climate change communication consultant as well as the writer, the challenge was to refrain from the need to rationalise and justify the various events on the island. However, like the work undertaken by the Nolan brothers, as well Finnegan and Mac Coille, my job was to act for the benefit of the development of our script and ultimately help my collaborators to find the balance of the aims of our project: the creation of a fictional story that can entertain and inform the future audience.

CHAPTER 6

Conclusions

Critical reflections on the findings from the analytical chapters

With the support of existing literature in screenwriting research, screen production, science communication and climate change communication, the analyses presented in this thesis allowed me to investigate the practice of collaborative script development for the production of cli-fi films in three interdisciplinary contexts. While in this first conclusion section I provide a summary of reflections from the analytical chapters, the following sections will focus on answering the specific research questions that led this research.

First, the case study of the script development and production of *Interstellar*, presented in Chapter 3, highlights how the collaboration between the science expert, the screenwriter and the filmmaker, with the application of Hollywood production techniques and scientific guidelines, led to *Interstellar* receiving the reputation of one of the most important cli-fi films of our times. The knowledge that arises from this case study describes a process of scriptwriting and embedding of the scientific concepts that began long before the involvement of the film director. As discussed in the chapter, such processes continued into the post-production phase, where typically the script is discarded in favour of the filmed material. This process of script development and the techniques employed in Thorne's collaboration with Jonathan Nolan, and later Christopher Nolan, in many ways mirror conventional writing practices. In the earliest stages, Thorne's role could be likened to a producer and Jonathan's role being that of a freelance writer helping to translate the producer's vision onto the page. This is how most Hollywood productions begin and Thorne was credited as a producer in the final film. This producer/writer style relationship is also evidenced by Thorne's desire to bring other scientists into the idea-generation stage, similar to a writers' room of sorts where ideas are pitched to help 'break' the story.

Where this working relationship departs from the typical working practices of the industry, is in the way that Thorne brought Jonathan Nolan under his wing to educate him on the science, providing detailed reading lists and research sources and advising on how to embed these in the script. In a typical production, a producer would rarely be so prescriptive and would expect the writer to undertake their own research. The unconventional approach to the development of this idea is akin to that of the independent sector of the industry where there's

more freedom to experiment with script development practices. This is further reinforced by the fact that in the early-stage development Thorne first wrote a forty-page treatment to pitch the story and the science of *Interstellar*, something that would rarely be accepted by mainstream industry professionals.

The analysis into the various storytelling techniques employed by Jonathan and Christopher Nolan for the embedding of the scientific concepts and the environmental catastrophe affecting Cooper's world also speak to the contributions of the screenwriter in a typical Hollywood production but, in this case, one that is characterised by a unique interdisciplinary collaboration. Jonathan Nolan incorporated various components into the script that allowed the characters and their stories to become more identifiable to a mainstream audience while following Thorne's guidelines, and Christopher Nolan even negotiated with Thorne later to find what he deemed to be the "worthwhile concepts" to focus on for the benefit of the audience. These insights into the production of *Interstellar* are evidence of the challenges that all filmmakers face when collaborating on the development of a screenplay, but with the addition of further negotiations related to a specific topic to be embedded in the story.

As a matter of fact, it is through the analysis of these challenges that the most valuable lessons about script development in interdisciplinary collaborations can be found. The collaboration between Thorne and the Nolan brothers demonstrates that the embedding of scientific concepts into a screenwork is not a fixed and defined process, and compromises are needed in order to make the collaboration work. This was evidenced through the analysis of the different brainstorming sessions from the early stages of the development between Jonathan Nolan and Thorne when they had to discuss and establish the scientific concepts that would be incorporated in the story in a way that worked for the character's journey as well. As the goal of such collaborations is the production of a science-fiction film that is aimed for entertainment, Thorne's theories and calculations had to be adapted in order to find the appropriate place in the script. On the other hand, this case study shows that research and acclimatisation to the subject specifics are also needed by the screenwriter/filmmaker in order to bridge the knowledge gap inherent at the beginning of the venture, a challenge that was most welcomed by both Christopher and Jonathan Nolan. However, in moments of struggle in the creative process, the editorial choices for the story and the script did not only rely on Thorne's studies and knowledge: several other scientists were brought in by the professor, Lynda Obst and Jonathan Nolan to enrich the story while maintaining authenticity. This arguably makes *Interstellar* a pivotal study for practitioners/researchers who aim to learn about best practice and how to approach certain obstacles in interdisciplinary collaborations.

The testimony of Christopher Nolan also highlights an extensive work of synthesis of certain concepts, which is inevitable when dealing with complex science that is to be presented through fiction. In other words, the incorporation of science is not a process that can be precisely planned at the beginning of the script development journey; this process must be nurtured through and adapted to each stage of the production. Following my research, this statement is also the result of the study of the post-production stages of *Interstellar*, where Thorne and Nolan further developed the story and collaborated on a series of scientific experiments with the VFX team to better understand Thorne's science and how to depict this through visuals. Thorne's access and influence at this stage of the production are unprecedented, as is the nature of their work, which further reinforces the idea that, at least in terms of the underpinning values that drove its production, *Interstellar*, at times, resembled the type of film one might expect from the Independent sector. All of this is to say that while the final film might feel like a conventional space-exploration epic, the script development process and all the other individual components which led to it are, by any industry standard, unconventional yet iconic for a study of interdisciplinary collaboration in the production of cli-fi films.

The analysis of the making of *Be Tradition*, presented in Chapter 4, also revealed a process of script development which was challenged by the collaboration with non-filmmakers, in this case an engineer, strict funding guidelines put forth by academic funding bodies, and an attempt to communicate complex scientific ideas to the lay public. In many respects, it mirrored the stages of development that Kip Thorne had outlined in our interview, but unlike the case study of *Interstellar*, which was predominantly analysed from the scientist's perspective, the case of *Be Tradition* offers an investigation of my experience as a screenwriter/filmmaker while working in the realm of the science related to renewable and sustainable energy. The results of this analysis demonstrated a new set of challenges for the script development process where restrictions from funding bodies and a general lack of creative license led to a stalling of the project as the scientist and the screenwriter tried to agree on how best to communicate the complex ideas from the funding application brief. This resulted in the screenwriter-filmmaker being the primary contributor of ideas as the scientist, because of their lack of experience in the storytelling fields, struggled to adapt to screen storytelling.

The process of idea generation for *Be Tradition* was based on the use of metaphors to communicate complex science. However, in the middle of the screenwriting stage, it became clear that on-screen text would be needed to make an explicit connection to the important research in CCUS undertaken by Andreoli. When it was time to script these lines of narration

in the post-production stage, we embarked on another round of screenwriting and idea generation where Andreoli and I went back and forth on the specifics of the narration. In the case of this short cli-fi the visuals served as the surface text of the film, whereas the overlaid text, presented as motion graphics, was a form of subtext for the audience to consider after the piece ended. Given the importance of this on-screen text, pre-visualisation techniques were adopted to help Andreoli and our production team finalise the scripting of the narration.

The application of motion graphics and animated text as a form of communicating the screen idea is one that, I argue, further demonstrates the ongoing nature of script development – not just a stage confined to pre-production, but one that sits at the heart of all stages of filmmaking. The specific scientific concepts to be included in the narrative were selected at the early stages of pre-production, but the script/text was developed in post-production after the realisation that further information was needed to make the underlying message of the film clearer for the audience. Some parallels can be found between my own practice at this late stage with that of more conventional productions that undertake last-minute re-shoots and script-rewrites. This stage of last-minute rewriting is commonplace within the industry, where filmmakers do ‘pick-ups’ or, in the case of more mainstream films, reshoot entire sections of the film that simply don’t work as well as the producers would like. This is where the ongoing scripting process is most evident and, though *Be Tradition* is far removed from such Hollywood examples, the underpinning rationale to undertake such practices, as well as the methods employed are essentially the same.

In many ways, this late process proved to be one of the most valuable experiences in the whole production because it demonstrated the importance and value of pre-visualisation practices in the earlier stages of the production as well. Had we known how these practices would have helped bridge the knowledge gaps between Andreoli and me, we would have incorporated them into the very beginning of the project. Pre-visualisation is not normally considered a part of traditional screenwriting practice, in part because of the fact that the first draft of a screenplay is typically written outside of a production environment. However, the analysis in this chapter argues that an embracing of such practices by the screenwriter at that early stage can benefit the collaboration between writer and scientist and prevent the stalling of development or even collapse of the collaboration entirely.

Unfortunately, due to a lack of sufficient funds from the outset, even if we desired it, it might not have been possible to pay an artist to help us with the creation of pre-visualization images or a storyboard. Due to the inability to hire professional actors with our limited funds we were forced to use local volunteers, which discouraged us from writing dialogue in the

script. The regulations from Swansea University also originally required us to commission a production company to which we had no links. This was not possible due to the low budget we were working with. Such an amount would never have been accepted by an established production company. It was yet another example of the challenges faced by interdisciplinary-academic collaborations between media and science departments for the development of fictional films whose mission is to communicate scientific ideas on screen.

My practice-led research was completed through my experience of writing the environmental thriller *The Dead Cry Out* in collaboration with other writers and filmmakers, as presented in Chapter 5. In this context, the challenge was enhanced by the fact that I was not only trying to communicate the screen idea by embracing the role of the screenwriter, but I was also taking on the role of the climate change communication consultant. Several conclusions and lessons came from this experience, as discussed in the following paragraphs, but perhaps the most important of all is the recognition that, as screenwriters in an interdisciplinary collaboration, to focus on the communication and embedding of the climate science for the future script is not enough. The practitioner-research in this scenario first needs to work on the communication of the screen idea to their collaborators before proceeding with the inclusion of the scientific concept or, in our case, a specific environmental problem. The writing of a screenplay is a fluid and flexible process (Batty and Waldeback, 2019) and so is the concept of scientific authenticity (Kirby, 2014), but without all the parties agreeing on the same screen idea while laying the foundation for the story it is hard to proceed with the embedding of the subject studied. From this perspective, climate science can be the inspiration for the project, but specific work on the story through development documents such as premises, treatments and synopses, needs to come first.

Furthermore, the personal agendas and the ontological and epistemological beliefs of the people involved in the script development process will make a significant difference in the dynamics of the collaboration and on the final product – in this case, the script. As explained in the exegesis, the embedding and communication of climate science in *The Dead Cry Out* was not a priority for the other members of the team as it was for me, and the aims of my study as a practitioner-research were not the same career goals of my collaborators at that time. This was natural and understandable, and while there was an openness to accepting my agenda for the writing of this script, its execution was in the hands of the other team members as well as my own. In a pivotal moment when we struggled to agree and set on the specific environmental catastrophe affecting the characters in our fictional story, similarly to Thorne and Jonathan Nolan, I organised a brainstorming session with the geologist Yorke to provide a compelling

enough case for my collaborators – with the support of Yoke’s expertise in the subject the science soon found its place in the story. The important lesson here is that, sometimes, it is necessary to involve other experts and consultants outside the core members of the writing team in order to agree and establish the story elements that should be included.

Finally, the exegesis of the writing of *The Dead Cry Out* shows that implementing the science in a way that is palatable for the audience involves more than just imaginative idea generation or the support of scientific advisors. It also requires the screenwriter’s strong knowledge of story structure, theme and genre, character development, and an understanding of identification theories. If the function of deep structural theories around screenwriting is for the benefit of the audience’s identification with the character’s ‘wants’ and ‘needs’ (Cattrysse, 2010; Finnegan, 2016) then it stands to reason that these same concepts would play an important role as development tools for the inclusion of the scientific concepts in the script. Incorporating reflective moments or a dramatic pause in the story now and again, similar to the so-called ‘campfire scene’ in a western or any other adventure film, proved essential in ensuring that the reader/audience would understand and accept the climate warning embedded into the story. This was a place where I found common ground with my collaborators, given their own knowledge of storytelling techniques as screenwriters and filmmakers.

Besides resorting to the use of specific dialogue for the communication of the environmental issue on the fictional island of the story, my collaborators and I found other ways to embed the impacts of climate change. Finnegan, already inspired by some of my research and the idea of climate change risk messages as a dramatic device, helped me to include climate imagery throughout the story as world descriptions. One of the many examples I outlined in the exegesis was the use of images of climate refugees on the news, or desperate islanders looking to escape by boat, as a means of instantaneously conjuring images of climate-related documentaries and news reports in the mind of the reader or spectator. In the same way, spectators and critics projected a climate-related message onto *Interstellar*, so too, we argued, would audiences draw the same conclusions with *The Dead Cry Out*.

Finally, from this collaboration, I learned that there was a responsibility on my part to guide the team with these driving ideas of climate change communication in mind and, like any manager, a strong collaborative ethos was needed. This involved organising regular meetings and brainstorming sessions, without which we would not have yielded such strong methods of achieving the goal of writing a climate-science investigative thriller. Ultimately, the experience that I have described in this last section mirrors that of Kip Thorne in his collaboration with the Nolan brothers and the wealth of other members from the *Interstellar*

production team, as well as those challenges faced by me and Andreoli in the communication of his research concepts and principles in the development of the screen idea for *Be Tradition*. The next sections will further discuss the results and findings of my research by considering the specific research questions that led this study.

How do screenwriters/filmmakers and scientists approach the writing of scientific concepts during the collaborative script development of cli-fi films?

The three research contexts presented in this thesis confirm that the collaboration between screenwriter and director is naturally filled with an unspoken tension where conflicting objectives and visions for the project force the creatives to make compromises. Overall, my study concludes that the desire and ability to compromise and negotiate, which are needed to overcome those tensions, are positive attributes for the researcher-practitioners to possess. Hodge's research into pedagogical approaches to positive collaborative practices argues that such skills "can open as many career doors as talent and technical skill". Dooley and Sexton-Finck (2017) also argue the need for greater teamwork and collaborative qualities "to orient students towards increased self-knowledge and improve their chances of success in whatever careers they chose". While each of these researchers discusses the challenges of collaboration from a students' perspective, their desire for greater education on the subject is indicative of the inherent challenges that industry practitioners face in a collaborative production environment and the need to circumvent these obstacles at an early stage. Returning to the research contexts of this thesis, the issue of scientific authenticity as a creative objective is one emblematic example of those aforementioned tensions.

This research finds that in order to achieve such objective science experts and consultants involved in the script development also tend to seek further advice and approval from other scientists or wider scientific communities. This can happen prior to the writing of the screenplay, as seen with Thorne in the case of *Interstellar*, or during the development of some specific scenes, as I observed through my practice with the writing of *The Dead Cry Out*. In the case of *Be Tradition*, neither Andreoli nor I explicitly look for support and advice from other members of the scientific community, but Andreoli's process was still driven by the research and application for funding that was based on his work in collaboration with other engineers in his laboratory at Swansea University. At the same time, my analyses remark the will of the screenwriter/filmmaker to educate themselves on the specific scientific concepts that are expected to be embedded in the script as the scientist presents these to them.

While this is certainly a healthy approach to the writing and embedding of scientific concepts in a fictional narrative, my study also argues that the dichotomies between the scientist's and the screenwriter/filmmaker's approaches to the creative process can significantly slow down the development of the script. Both parties need to go through a series of brainstorming and feedback sessions in order to negotiate and agree on what are the right scientific concepts to include in the story and the script, which inevitably lead to delays in the process. As observed in the three research contexts, these particular brainstorming sessions are a useful site for the parties to discuss the different concerns one might have during the development, so that to reach an understanding and a balance between the different approaches to the writing and embedding of the science.

From the science consultant's perspective, it is always important that the film remains faithful to the science that has been negotiated at the beginning of the script development process. While Thorne tried to keep the scientific essence of his narrative as he navigated the production of *Interstellar* under different directors, in the case of *Be Tradition* Andreoli's concern was that our final screenwork should present exactly what was promised in the application for funding with the science research councils. In the context of writing *The Dead Cry Out*, as I embraced the role of the climate change communication expert, I was constantly focused on finding plausible explanations that could justify the natural events and the environmental catastrophe unfolding on the fictional island. This revealed a strong need on my part to maintain a high level of authenticity and accuracy, similarly to Thorne and Andreoli.

On the other hand, the three research contexts reveal that in the collaborative script development of the cli-fi the screenwriter/filmmaker main objective is to create believable and identifiable characters and present their journey in a well-structured plot, both for the benefit of the script and the future film. As narratives can transcend cultures and time (Parker, 1999), the screenwriter/filmmaker naturally looks at the universality of the story, whereas the scientists tend to focus on the specific details of the science (Kirby, 2003; 2013). In other words, while the screenwriter/filmmaker focuses on the more technical aspects of script development, the scientist is concerned with the truthfulness and authenticity of the film. For example, during the writing of *The Dead Cry Out*, Finnegan and Mac Coille agreed that if were too exact and specific with the elements of the story (in this case the science) we may lose the attention of the audience and give them more space to counter-argue our story and debunk the idea behind the environmental disaster. This is very similar to the Nolan brothers' approach to the script development and the embedding of the science in *Interstellar*. While Jonathan Nolan claimed of trying to embed the natural catastrophe without overly referencing the science

behind it, or the idea of the man-made disaster in particular, Christopher Nolan explained that he and his brother always tried not to be too didactic with their writing. This is a similar approach to the writing that I adopted during the development of *Be Tradition*, when I proposed that we stepped away from Andreoli's specific work in CCUS and opted for a metaphor. Nonetheless, all this research contexts show that both the screenwriter/filmmaker and the scientist always share the common goal of creating a story that can reach a wide audience, a goal that eventually transcends all their differences in relations to beliefs, approaches to writing, and personal agendas.

Thus, it is clear that at some point in the collaborative script development process of the cli-fi there is a common tendency to shift the attention from the specific scientific concepts to the creation of speculative scenarios and metaphors that can help with the embedding of concepts while facilitating the audience's engagement with the story. Despite the speculative nature of these scenarios, the involvement of the science expert since the early stages of the script development, plus the kind of collaborative work required for the embedding of the science, warrant that these scenarios/representations are still grounded in science and maintain a high level of authenticity. The three contexts under investigation also showed significant efforts from all the parties in balancing the science, the fiction and the speculations presented in the script of their respective films, and a common ground was always found when both the screenwriter/filmmaker and the science expert got closer to the human aspect of the science, or more specifically, to the human aspect of the environmental problem embedded in the story.

The scientist and the screenwriter/filmmaker share a mutual interest in finding a way to relate complex scientific concepts on a human scale. This is a goal that is common to both the scientist, who needs to communicate their findings, and the screenwriter/filmmaker, who is naturally inclined to articulate concepts and stories in a way that can be understood and appreciated universally. However, the embedding of the science during the script development process requires a significant amount of flexibility and openness to knowledge from both sides. As this research opened with the review of screenwriting theory that describe script development process as a fluid and flexible process, I conclude that so is the process of embedding the scientific concept into the script. Furthermore, whilst all the parties involved in the script development ultimately aim for the creation of authentic and scientifically plausible scenarios, the screenwriter/filmmaker also turn to their life experiences to build scenarios and story elements, as we naturally tend to 'write what we know'. For example, in *Interstellar*, Jonathan Nolan uses his experience as a father to create the relationship between Murph and Cooper; in *Be Tradition*, I resort to my father's story of becoming a chef, and in *The Dead Cry*

Out we took into consideration our respective cultures, research knowledge and religious beliefs. Thus, the screenwriter/filmmaker, in collaboration with the scientist, tends to embed scientific concepts in the script through a blend of subjective experience and speculations stemming from science.

Another important aspect to highlight in regard to differing approaches to the writing of the cli-fi is the personal agenda that belongs to the screenwriter/filmmaker and the science experts in this collaboration. The three cases under investigation showed that the screenwriter/filmmaker usually decides to engage in a collaboration for the development of a cli-fi in order to create a screenwork that can entertain the public, whereas the scientist uses the screenwork to attract the audience and get them excited about the specific films. In the end, in such collaborations, both the screenwriter/filmmaker and the scientist believe in the use of fictional films to facilitate the communication of complex scientific ideas to a non-specialist audience. But despite the significant commitment from both the screenwriter/filmmaker's and the scientist's side, there are always challenges and struggles in the communication of the screen ideas as one works in a team. This was particularly evident through my experience in the production of *Be Tradition*. While Andreoli often struggled to envision how the story that I was proposing would play out once his research was embedded, I, on the other hand, was struggling to prioritise discussions about the science over the creative process. Interdisciplinary collaborations are a true challenge, and in the case of *Be Tradition*, I propose that the communication of the screen idea in the pre-production stage might have been facilitated by the production of other supporting documents such as story-boarding or pre-visualisation images.

In regard to the navigation of the different challenges posed by the collaboration, I also suggest that perhaps a clearer agreement, a sort of contract, between the scientist and the filmmaker at the beginning of every project, as observed in *Interstellar*, may help keep the balance between the creative process and the work needed for the embedding of the science. Both the scientist's and the filmmaker's voices are essential in the script writing process, but it is always important to keep in mind the nature of the output that is being created, in this case the fictional film that aims to not only inform but also entertain. To conclude these reflections on the different approaches to the writing and embedding of science that is linked to climate change, it is important to note that, in none of the productions the creators decided to explicitly mention the phrase 'climate-change'. This is because there is a tendency to avoid making specific references and comments on climate change as, while part of the audience may be

immediately transported by the subject due to a specific interest, another part might be sceptical and the explicit reference to the topic may distance them from the narrative and its message.

How does the embedding of scientific concepts in the story affect the script development process?

The case study and the practice-led investigation undertaken as part of this research demonstrate that for an analysis of the collaborative script development process for a cli-fi film it is necessary to look beyond the pages of the screenplay and the traditional scriptwriting stage. First, looking at early pre-production stages, my analyses showed that the development process can be affected by the scientist's establishment of guidelines for the embedding of the scientific concepts in the script. In the case of *Interstellar*, these guidelines were explicitly stated but similar 'restrictions' can be seen in the development of *Be Tradition*, which was bound to follow the premises and promises of the research outcome as outlined in the application for funding. Nonetheless, the establishment of guidelines can also occur from the screenwriter's perspective as it happened at the beginning of the development of *The Dead Cry Out*, when Finnegan negotiated that we should concentrate on the plot first and leave the inclusion of the environmental catastrophe and the science to a later stage.

This also highlights that the collaborative script development process can begin with either the writing of pitch and development documents (e.g. premises, synopses and treatments) that emphasise the inclusion of the scientific concepts first, as it occurred for *Interstellar* and *Be Tradition*, or it can commence with a focus on plot, as it happened with *The Dead Cry Out*. This will depend on the dynamics of the collaboration, the establishment of those guidelines and the way these are accepted among the team members. In the case where the development begins with the writing of documents that mainly outline the science that will be included in the future screenplay, the screenwriter/filmmaker and the scientist tend to focus on finding a suitable story to which the scientific concepts could be embedded. Thus, in this case, the science seems to dictate what the character's journey should be: a different process from the one of having a screenplay in an established film production where the scientist is brought in as a consultant to enhance the plausibility and authenticity of the existing story. For the latter, the result of the initial brainstorming sessions is a development document that will likely focus on story structure and without including any specific reference to climate change nor the kind of disaster affecting our protagonist's world.

However, in both cases, the writing of those early-stage development documents is an opportunity to start integrating information about the climate science, or any other

representation of climate change impacts, prior to the writing of the screenplay. Thus, the writing of premises, synopses and treatments, which is essential in most script development processes, becomes an equally important stage for the embedding of scientific concepts as the one of scriptwriting. Beside the different approaches for the inclusion of scientific concepts in the script, the initial development of a screen idea can be affected by: 1) preliminary assessments of the future research impact of the film, as seen with *Be Tradition*; 2) discussions about the possible messages that the narrative will disseminate, as observed in all three contexts; 3) issues in relation to budget. The latter was an issue clearly stated in the exegesis of *Be Tradition*, but a similar dynamic could also be observed during the collaboration with Mac Coille for *The Dead Cry Out*, where the director encouraged us to think about budget whenever we developed scenes depicting the unfolding of the environmental catastrophe.

As the three research contexts demonstrated, brainstorming and feedback sessions with the science experts inside and outside the production team, also have a significant impact on the development of the script. These sessions can provide both the scientists and the screenwriter/filmmaker with new ideas for the script and help the writing team overcome existing issues with character development, dialogue and plot, as well as help the writers improve the plausibility and authenticity of the scenes. These brainstorming and feedback sessions can also have an impact on the length of the project. Whilst for some productions this might not be an issue (e.g. experimental projects such as *The Dead Cry Out*), this is an important factor to take into consideration for all those productions that work on a strict schedule. As the scientist and the screenwriter/filmmaker discusses and negotiates the scientific concepts to be embedded in the story, this can add several months, or even years, to the script development process. This, of course, is a point to be considered next to the many other unexpected accidents that can typically slow down the film production. Part of the job of the screenwriter/filmmaker in these collaborations consists of going back to the script several times to make sure that each scientific concept is linked to the protagonist's journey and has a dramatic function. This editing process is also flanked by the scientist's feedback, which in some cases might cause further delays in the development. Whilst in the case of *Interstellar*, which took nearly ten years to make, this did not seem to be a specific problem for the production, in the case of *Be Tradition* we were under pressure to finalise the script and proceed with the filming since the funds must be spent within two years from the day they were awarded.

Whilst the use of speculative scenarios has been widely recognised and discussed in academic literature as a key factor in the communication of science and climate change through

fiction (Kirby, 2013; Irr, 2017; Oziewicz, 2017), the three cli-fi productions under investigation in this research provided an opportunity to observe the development of such scenarios/speculations and their function in the collaborative script development process. The analysis of the challenges in these three interdisciplinary-collaborative contexts revealed that the development of the script could only advance when the creators (both scientists and filmmakers/screenwriters) shifted the attention from the specific science to the broader message that the narrative should disseminate, resorting to the use of metaphors, allegories and the writing of such speculative scenarios. Although this may seem the obvious and natural approach when writing a story for the screen, the focus on scientific concepts in the early-stage of such interdisciplinary collaborations causes delays with the kind of work and reflections that are expected from the creative process. My study shows that in these collaborations, the creative process, from pre to post-production, is characterised by a constant flow of negotiations and compromises between the scientist and the screenwriter/filmmaker on the kind of speculative science that should be used/depicted in each scene. This process allows the writers to address sophisticated scientific concepts by simplifying them with the help and the approval of the science expert, as specifically pointed out by Nolan and Nolan (2014). In the case of *Interstellar*, the Nolan brothers and Thorne opted for the embedding of scientific concepts and rules that could be ‘summarised’ or that felt ‘more instinctual’ for a lay public, proving that these collaborations between scientists and screenwriters/filmmakers involve more than a simple transfer of information (Kirby, 2013). As demonstrated in this research, behind such productions there is an extensive work for the selection of the kind of science that is the most appropriate to embed into the fictional story and script in order to retain the audience’s attention and improve their identification with the characters.

The three research contexts also showed that at different stages of the development some aspects of the embedded science can end up being cut from the story and the script, or is eventually dissolved into a metaphor, as the hand of the screenwriter/filmmaker naturally prioritises the development of the characters’ journeys and the plot. As discussed in the analytical chapters, the effects of the embedding of scientific concepts in the script can be observed from different points: from the writing of the dialogue, action and world description to the generation of additional text and images in post-production. For example, the analyses of brainstorming sessions between the science consultant and the screenwriter/filmmaker showed that further discussions about the specific science can help the screenwriter/filmmaker fix existing plot issues and underpin some of the dialogue for the film. In the case of *Interstellar* and *The Dead Cry Out* the incorporation of scientific concepts is explicitly identifiable from

the dialogue, especially when the characters explain the issues affecting their environments. In *Be Tradition*, instead, this can be seen in the text that was developed in post-production and included as motion graphics.

However, the analyses of the script development of these cli-fi films, also show that the topic of climate change, and the different scientific concepts that are related to it, can be conveyed and embedded in the screenplay through other elements besides specific lines of dialogues. For instance, the writer can concentrate on the creation/description of the community's reaction to the impact of climate change, how the community deals with it, or showing the opposing views on the problem. The inspiration for these scenes can come from different sources. For examples, the construction of these elements can be inspired by the climate change visuals that we are used to seeing through the media, by climate change communication theories and other academic research. Thus, it can be concluded that in the writing of the cli-fi, the screenwriter and the science expert not only consider notions of climate science, but they can also draw ideas from social theories and research that goes beyond the specific science. Subsequently, these new ideas coming from the research will be integrated into the characters' action, the dialogue, and the world descriptions.

As previously discussed, the writing of the screenplay for a cli-fi film can also involve the writing of additional text in post-production to create a specific link between the metaphor and the science behind it. The writing of additional text and images, as demonstrated with the creation of the motion graphics for *Be Tradition* or with the development of new scene by Thorne and Nolan in post-production, are an integral part of the collaborative script development process and an enhancement of the initial screen idea. Considering such steps in the production, it is possible to affirm that both the *script writing process* and the *embedding of the science in the script* can continue to the editing stage, showing that in the collaborative development of a cli-fi these parallel, fluid and flexible processes are not confined to a pre-production stage. The complexity of the collaborative script development process for cli-fi narratives, as analysed in this thesis, also has an impact on the ways the film is read and its categorisation as a specific genre. For example, while the focus on the construction of the protagonist's journey for *Interstellar* may lead to a consideration of the film as a drama or a thriller, looking at the environmental disaster and the science embedded in the film we are led to label it as a cli-fi. These productions may also be defined as speculative fiction, and this research has shown that discussions of 'speculations' and the creation of speculative scenarios for the incorporation of scientific concepts are necessary and inevitable steps.

As discussed by Kirby (2003), depictions of science in cinema are “naturalised” through the lens of the camera and the filmmaker’s creative license, a process that has traditionally led scientists to fear that fiction can have a negative effect on the public understanding of science since these representations may be inaccurate. Like Kirby, Manzo (2017) argues that this is a natural aspect of these productions and therefore it would be wrong to only assess the usefulness of cli-fi films on the basis of their degree of accuracy. Instead, we should refer to criteria such as *teachability* and *integrity*, which were well reflected in all three contexts of my investigation. Following these theories, and specifically in reference to the script development of cli-fi films, my practice-led research concludes that speculative scenarios and speculations of science in fictional films, as sometimes criticised by the scientific community (Kirby, 2003), should not be seen as a limitation or a damage to the authenticity of the depiction of science. The translation of scientific concepts into speculative scenarios for the script are not a failure in the process but a natural development of the initial concept into information and images that are friendlier for the audience. In the end, speculative scenarios, metaphors and allegories represent the evolution and advancement of the collaborative process between the scientist and screenwriter/filmmaker and as such, these are integral part of the story and script development process. Thus, the authenticity of the film can be found through an investigation of this collaborative practice and not only through a textual analysis of the final script (or the final film).

Overall, the case study and the practice-led research presented in this thesis are a demonstration that the development of speculative scenarios and the embedding of scientific concepts in the script for a cli-fi film are more than a simple case of putting together isolated events/elements in a few scenes. The writing and making of these scenarios for the screen is a complex and extensive process that involves the understanding of the scientific concepts, the synthesis of these concepts, and the creation of scenes that allow for the embedding of these elements through dialogue, action and world descriptions. Thus, the screenwriter/filmmaker and the scientist not only need to develop ‘possibilities’ for each concept to be included, they also need to work out how all these scenarios and elements will fit together. What makes these collaborative script development processes unique is indeed the strong commitment shown by the different parties to guarantee the balance of all these elements throughout the narrative while remaining faithful and authentic to the science.

Reflections on the methodology and final remarks

The knowledge generated by the analyses presented in this thesis is the result of research into the film industry practices and critical reflections on my experience as a writer, filmmaker, and producer of climate fiction narratives for the screen. To use a practice-led methodology within the screen-production-research framework was necessary for analysing aspects of the collaborative script development process that may be overlooked if the researcher only considers the screenplay in isolation. The screenplay is the end result of the collaboration and, if viewed in relation to its film counterpart, it is never a completed piece of work (Macdonald, 2004). A practice-led methodology encourages the researcher to begin with an analysis of the development of the screen idea, as theorised by Macdonald (2004), and other specific aspects such as the work involved in the reading (and re-reading) of notes, discussion and redrafting, and the creation (and re-creation) of something that represents a common understanding. In other words, the practice-led research approach provided me with an opportunity to reflect on the decision-making process that influences the development of a script, and the final film, in an interdisciplinary collaboration.

Through the applications of screenwriting concepts such as the one of the ‘shared’ screen idea (Macdonald, 2004) I was then able to focus on both my practice and the role of my collaborators, in this case screenwriters/filmmakers and scientists, in the development of the story and the script while outlining the reflections and negotiations that were needed in the creative process. As my research approach was one of ‘learning-by-doing’, it was imperative that I put myself in the shoes of the people that I was describing, so that my observations and writings about the experience of collaboration was coming from a place of truth and authenticity. For this reason, besides writing and producing *Be Tradition*, for *The Dead Cry Out* I also took the role of the climate-change-communication consultant while writing the script. This was my way to avoid making assumptions only based on other practitioners’ experience, including the one of the science experts who try to embed their research into a fictional story and its script following their own agenda.

However, practice-led research is not without its challenges as it inevitably becomes a personal experience that might not reflect that of others in the industry and the academy. Moreover, as claimed at the beginning of this research, academic case studies on the production of science fiction films are limited and specific studies on the script development process of cli-fi films could not be found within existing academic literature. Thus, to overcome issues in relation to subjectivity that characterises screen-production-research and practice-led

methodology in particular (Kerrigan, 2018), I resorted to a case study of an already completed production such as *Interstellar* that could inform my research and practice by 1) providing lessons from the film industry, 2) revealing aspects of the script development process within a collaborative-interdisciplinary context, and 3) adding new knowledge to the literature on script development and the production of sci-fi and cli-fi films.

Besides keeping a record of the various reflections on my practice, in terms of data gathering, the most valuable method in this screen production research was the use of interviews. However, the process of interviewing came with its own challenges. The interview with professor Thorne was conducted almost four years after the release of *Interstellar* in cinemas, whereas the interviews with my collaborators were conducted a few months after the completion of our projects. Therefore, these interviews required a reconstruction of the development process based on memory retrieval. In order to reinforce the reliability of the various testimonies, I opted for the use of supporting material. For the interview with Thorne, I took data from his book about the science behind *Interstellar*, and another interview that the Nolan brothers conducted with *Faber and Faber*, both published in 2014. For the analyses of *Be Tradition* and *The Dead Cry Out*, beside the interviews with Andreoli, Finnegan and Mac Coille, I relied on data coming from emails and notes from the brainstorming sessions, as well as an extensive record of the script drafts, to provide a more accurate picture of pivotal moments in the development of the script. Whilst interviews that are conducted during the process may prove equally valuable in the investigation, some time away from the project is needed to allow the practitioner-research and the collaborators to reflect and elaborate moments of the development process in order to gain deeper insights about their approach and experiences that may not be possible to address during the practice.

Linked to the reflections that derived from the application of a practice-led methodology with the use of methods such as screenwriting and filmmaking, the results of the case study allowed me to triangulate my findings to offer more robust conclusions, as discussed in the previous sections of this chapter, on the subjects of collaborative script development and the embedding of scientific concepts in the production of cli-fi films. Triangulation refers to the application of multiple methods of data collection about the same phenomenon, in my case the collaborative script development process of cli-fi films, that mostly includes interviews, reflections/observations and filed notes (Carter et al., 2014). The combination of these multiple methods for the analysis of the same process is used to add trustworthiness, credibility, rigour and richness to the enquiry and, as for my study, each method yields a “different picture” and a “different slice” of the same reality (Denzin, 2015: 1-3). Thus, the triangulation of the

findings coming from similar collaborative script development processes in my three research contexts allowed me to draw conclusions that mirror both my personal experience and the one of other academics and practitioners providing a more comprehensive view on this practice.

Academic literature in the fields of script development, the production of sci-fi films, audience reception studies, speculative fiction, and climate change communication also provided me with a foundation to begin challenging my assumptions as a practitioner-researcher about the production of climate-fiction films and the process of collaboration with scientists in filmmaking. Without this, the practice and the analysis of the practice would have had less direction and focus. Therefore, the case study of *Interstellar* and other relevant literature served as a compass to help guide my work. At the beginning of a screenwriting venture, there is an expectation that the multiple existing guidelines about the collaborative writing of the screenplay will provide quick and effective directions for a smooth development of the script, as detailed in screenwriting manuals (Moulton, 2019; Batty 2014). However, as discussed in the previous section, the script is flexible and fluid and changes according to the multiple voices involved the production (Batty and Waldeback, 2019). If we consider the interdisciplinary nature of the contexts under investigation, the multiple voices involved in the script development process appear both as a support and an obstacle to this process, causing delays with the kind of reflections and work that are required by the creative process.

Nonetheless, both scientists and screenwriters/filmmakers can rely on development documents (e.g. treatments, synopses, step outlines) and screenwriting theories (e.g. character, structure, identification) to find common grounds and begin the inclusion of the scientific concepts through the different layers of the story and the script. Like the fluid nature of the script, the notions of scientific authenticity and accuracy are also flexible (Kirby, 2003; 2014), depending on the participants of the project, and though the achievement of the creation of an authentic story is also a common goal, the use of speculations and speculative scenarios are inevitable and practitioners-researchers and scientists should welcome and embrace this aspect of the craft as an opportunity rather than a risk to provide and inaccurate depiction of the science. When it comes to climate change, it is common to judge the film based on its accuracy (Manzo, 2017), but an analysis of the script development process confirms that rather than considering the specific visual representation of climate change, we should consider the teachability and integrity that characterised the specific creative process. The scientist's need to disseminate educational messages (e.g. sustainability, respect for nature, the risks of climate change) and the screenwriter/filmmaker's call to the production of engaging and entertaining

stories encourage these experts to come together as a team as they work towards reaching the audience on a human level while subtly imparting information about specific science.

As a practitioner-researcher, reflexivity was crucial in every step of the research process in order to arrive at such conclusions - even when existing theory might have already provided a partial answer to the research questions. As this thesis shows, my study applied numerous moments of critical reflection, where I analysed the choices made by myself and the team and reflected on what those decisions meant for our work and how these affected the script development process. After reporting the specific findings of this practice-led research in the various sections of this concluding chapter, I close this thesis by providing some advice for those practitioners-researchers who wish to embark on a similar journey into script development and filmmaking in an interdisciplinary-academic context:

1) be open-minded and understand where your colleague is coming from and try to compromise with and respect each other's expertise and knowledge;

2) keep consistent communication with the participants of the project and avoid extended periods of silence (for creative purposes);

3) when budgeting for a creative project, especially films, make sure an appropriate amount of the funds is dedicated to the creation of pre-visualisation images (the importance of pre-visualisation work is a very obvious point for those working in the film industry but may be less evident for science experts and academics in general);

4) besides using the awarded funds, try to secure extra money from other sources as well; it will allow a more versatile use of the money in case of emergency (e.g. by using a Kickstarter campaign or crowdfunding in general);

5) define the role of each participant very carefully from the beginning in order to avoid future issues with the creative development of the work. Moreover, lastly, make sure you and your group of collaborators increase the conversation and spend a good amount of time exploring what other experts and artists have already achieved in similar areas of study.

As it has been clear for the reader, a portion of the knowledge generated through this practice-led research comes from personal experience and might not be applicable to other projects in different research contexts. Nonetheless, as this thesis demonstrated, practice-led research remains a valuable and effective methodology for any researcher who aims to make a contribution to knowledge in the fields of communication, media studies and screen production by applying an interdisciplinary approach to the research.

Bibliography

- Bailey, T. (2019). Intellectual spaces in screenwriting studies: The practitioner- academic and fidelity discourse, *Journal of Screenwriting*, 10:1, pp. 29–39, doi: 10.1386/jocs.10.1.29_1
- Bandura, A. (2012). *Social cognitive theory*. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (p. 349–373). Sage Publications Ltd. <https://doi.org/10.4135/9781446249215.n18>
- Ballantyne, A.G. (2016). Climate change communication: what can we learn from communication theory?. *WIREs Clim Change*, 7: 329–344. <https://doi.org/10.1002/wcc.392>
- Batty, C. (2010). The physical and emotional threads of the archetypal hero's journey: proposing common terminology and re-examining the narrative model. *Journal of Screenwriting* 1: 2, pp. 291–308, doi: 10.1386/ josc.1.2.291/1
- Batty, C. (2014). *Screenwriters and Screenwriting: Putting Practice into Context*. Palgrave Macmillan.
- Batty, C. (2016). Screenwriting studies, screenwriting practice and the screenwriting manual, *New Writing*, 13:1, 59–70, DOI: [10.1080/14790726.2015.1134579](https://doi.org/10.1080/14790726.2015.1134579)
- Batty, C., Taylor, S., Sawtell, L. and Conor, B. (2017). Script development: Defining the field, *Journal of Screenwriting*, 8:3, pp. 225–47, doi: 10.1386/ jocs.8.3.225_1
- Batty, C., O'Meara, R., Taylor, S., Joyce, H., Burne, P., Maloney, N., Poole, M., and Tofler, M., (2018). Script development as a “wicked problem”, *Journal of Screenwriting*, 9:2, pp. 153–74, doi: 10.1386/jocs.9.2.153_1
- Batty, C. and Kerrigan, S. (2018). *Screen Production Research: Creative Practice as a Mode of Enquiry*. Palgrave Macmillan.
- Batty, C. and Z. Waldeback (2019). *Writing for the Screen: Creative and Critical Approaches*. Second Edition. Macmillan International: Higher Education. Red Globe Press.
- Beck, U. (1992). *Risk Society: Towards a New Modernity*. Sage Publications.
- Beck, U. (1998). Politics of Risk Society. In ‘The Politics of Risk Society’, by Franklin J. IPPR and Polity Press.
- Beck, U. (2009). *World at Risk*. Cambridge: Polity. Print.
- Beck, U. (2011). Cosmopolitanism as Imagined Communities of Global Risk. *American Behavioral Scientist*. 2011; 55(10):1346–1361. doi:[10.1177/0002764211409739](https://doi.org/10.1177/0002764211409739)
- Benton-Short, L., & Short, J.R. (2008). *Cities and nature*. London, England and New York: Routledge.
- Berg, B.L. (2007). *Qualitative Research Methods for the Social Sciences* (6th Edition). Boston, MA: Pearson.

- Berger, R. (2015). Now I see it, now I don't: researcher's position and reflexivity in qualitative research, *Qualitative Research*, 15(2), pp. 219–234.
doi: [10.1177/1468794112468475](https://doi.org/10.1177/1468794112468475).
- Blaikie, N. (2000). *Approaches to Social Enquiry: Advancing Knowledge*. Cambridge: Polity Press.
- Bloore, P. (2013). *The Screenplay Business: Managing Creativity and Script Development in the Film Business*. New York: Routledge.
- Boykoff, M.T. and J.M. Boykoff (2007). Climate change and journalistic norms: a case-study of US mass-media coverage. *Geoforum* 2007, 38:1190 – 1204.
- Bott, E. (2010). Favourites and others: reflexivity and the shaping of subjectivities and data in qualitative research, *Qualitative Research*, 10(2), pp. 159–173.
doi: [10.1177/1468794109356736](https://doi.org/10.1177/1468794109356736).
- Branston, G. A. (2007). The Planet at the End of the World: 'Event' cinema and the representability of climate change. *New Review of Film and Television Studies* 5 (2), pp. 211-229. [10.1080/17400300701432936](https://doi.org/10.1080/17400300701432936)
- Bradbury, N. A. (2016). Attention span during lectures: 8 seconds, 10 minutes, or more? *Advances in Physiology Education* 2016 40:4, 509-513
<https://doi.org/10.1152/advan.00109.2016>
- Brereton, P. (2015). Cinema, ecology and environment, *Handbook of Environment and Communication*, edited by Hansen, A. and Cox R., pp. 258 – 269. Routledge
- Burns TW, O'Connor DJ, Stocklmayer SM (2003). Science Communication: A Contemporary Definition, *Public Understanding of Science*. 2003;12(2):183-202.
doi:[10.1177/09636625030122004](https://doi.org/10.1177/09636625030122004)
- Campbell, V. (2014). Framing Environmental Risks and Natural Disasters in Factual Entertainment Television. In *Environmental Communication*, 8:1, 58-74.
DOI: [10.1080/17524032.2013.848222](https://doi.org/10.1080/17524032.2013.848222)
- Carter N, Bryant-Lukosius D, DiCenso A, Blythe J, Neville AJ (2014). The use of triangulation in qualitative research. *Oncology Nursing Forum*. Sep 2014; 41(5): 545-7. doi: [10.1188/14.ONF.545-547](https://doi.org/10.1188/14.ONF.545-547). PMID: 25158659.
- Cattrysse, P. (2010). The protagonist's dramatic goals, wants and needs. *Journal of Screenwriting*, 1: 1, pp. 83–97, doi: [10.1386/josc.1.1.83/1](https://doi.org/10.1386/josc.1.1.83/1)
- Climate Reality Project (June 01, 2018). 6 Must-See Movies about Climate Change. Available at: <https://www.climateRealityProject.org/blog/6-must-see-movies-about-climate-change> (Accessed: 6 July 2019).
- Cohen, J. (2001). Defining Identification: a theoretical look at the identification audiences with media characters. In *Mass Communication & Society*, 4, 245-264.

Connell, J. (2016). Last days in the Carteret Islands? Climate change, livelihoods and migration on coral atolls. *Asia Pacific Viewpoint* /Volume 57, Issue 1. Wiley online library.

Cortese, M. (2018). Reconsidering Fictional Films for Communicating Climate Change Issues: An Analysis of the Filmmaking Strategies Behind Sustainable Energy Narratives. In: Leal Filho W., Manolas E., Azul A., Azeiteiro U., McGhie H. (eds) *Handbook of Climate Change Communication: Vol. 1. Climate Change Management*. Springer, Cham. https://doi.org/10.1007/978-3-319-69838-0_8

Cox, R. (2013). *Environmental Communication and the Public Sphere*. 3rd Edition.

Crotty, M. (1998). *The Foundations of Social Research*. Sydney: Allen and Unwin.

Dezin, N. K. (2015). Triangulation. *The Blackwell Encyclopedia of Sociology*. Wiley Online Library. 26 October 2015. <https://doi.org/10.1002/9781405165518.wbeost050.pub2>

DiCaprio, L. (2016). Academy Awards Acceptance Speech. Available at: <https://www.youtube.com/watch?v=xpyrefzvTpI>

Dooley, K., & Sexton-Finck, L. (2017). A focus on collaboration: Fostering Australian screen production students' teamwork skills. *Journal of Teaching and Learning for Graduate Employability*, 8 (1), 74–105, 83.

Downs, J. S. (2014). Prescriptive scientific narratives for communicating usable science. *PNAS*, September 16, 2014, vol. 111 (4): 13627-13633.

Doyle, J. (2007). Picturing the Clima(c)tic: Greenpeace and the Representational Politics of Climate Change Communication, *Science as Culture*, 16:2, 129-150, DOI: [10.1080/09505430701368938](https://doi.org/10.1080/09505430701368938)

Environmental Agency UK (September 2011). Flooding from groundwater: Practical advice to help you reduce the impact of flooding from groundwater. Local Government Association. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/297421/flho0911bugi-e-e.pdf

Finlay, L. (2002). Negotiating the swamp: the opportunity and challenge of reflexivity in research practice, *Qualitative Research*, 2(2), pp. 209–230. doi: [10.1177/146879410200200205](https://doi.org/10.1177/146879410200200205).

Finnegan, J. (2016). The screenplay and the spectator: Exploring audience identification in narrative structure, *Journal of Screenwriting*, 7: 3, pp. 319–330, doi: [10.1386/jocs.7.3.319_1](https://doi.org/10.1386/jocs.7.3.319_1)

Finnegan, J. (2018). At the Crossing: Changing Perceptions, Technologies and Screenplay Functions in Contemporary Cinema. *Bangor University Theses*. Pure. [https://research.bangor.ac.uk/portal/en/theses/at-the-crossing\(a2e09d31-175a-4e45-93c7-25846e3accc6\).html](https://research.bangor.ac.uk/portal/en/theses/at-the-crossing(a2e09d31-175a-4e45-93c7-25846e3accc6).html)

Giddens, A. (1990). *The Consequences of Modernity*. Polity Press.

Green M.C. and T.C. Brock (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*, 79, 701-721.

Green M.C., Brock T.C., Kaufman G.F. (2004). Understanding Media Enjoyment: The Role of Transportation Into Narrative Worlds. In *Communication Theory* 14(4): 311-327.

Gomm, R., Hammersley, M., & Foster, P. (Eds.) (2009). *Case Study Method*. SAGE Publications Ltd <https://www.doi.org/10.4135/9780857024367>

Gomm, R., Hammersley, M. and Foster, P. (2009). Case Study and Generalization. In Gomm, R., Hammersley, M., & Foster, P. (Eds.) (2009). *Case Study Method*. SAGE Publications Ltd <https://www.doi.org/10.4135/9780857024367>

Hammond, P. and Breton, H. O. (2014). Bridging the Political Deficit: Loss, Morality, and Agency in Films Addressing Climate Change, *Communication, Culture and Critique*, 7(3), pp. 303–319. doi: [10.1111/cccr.12052](https://doi.org/10.1111/cccr.12052).

Hansen, A. and Machin D. (2008). Visually branding the environment: climate change as a marketing opportunity, *Discourse Studies*. 2008; 10(6):777-794.
doi:[10.1177/1461445608098200](https://doi.org/10.1177/1461445608098200)

Hansen A. and D. Machin (2013) Researching Visual Environmental Communication, *Environmental Communication*, 7:2, 151-168, DOI: [10.1080/17524032.2013.785441](https://doi.org/10.1080/17524032.2013.785441)

Herz, R. (1997). Introduction: Reflexivity and Voice. In R. Hertz (ed.) *Reflexivity and Voice*. Thousand Oaks, CA: Sage.

Hinyard LJ, Kreuter MW (2007). Using Narrative Communication as a Tool for Health Behavior Change: A Conceptual, Theoretical, and Empirical Overview. In *Health Education and Behaviour*, Vol. XX (X): 1-16.

Hodge, C. (2009). Film Collaboration and Creative Conflict. *Journal of Film and Video*, SPRING 2009, Vol. 61, No. 1, pp. 18- 30

Hudson-Edwards K.A., M.G. Macklin, P.A. Brewer and I.A. Dennis (November 2008). Assessment of Metal Mining- Contaminated River Sediments in England and Wales. UK Environment Agency Science Report SC030136/SR4. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291646/scho1108bozd-e-e.pdf

Hulme, M. (2009). Why We Disagree about Climate Change: Understanding Controversy, Inaction and Opportunity. Cambridge University Press.

IMDb (2019). Best Cli-fi or Climate Change Movie Climax.
<https://www.imdb.com/list/ls066770594/>

Industrial Light & Magic (2020). Star Wars: The Force Awakens. Projects. Available at: <https://www.ilm.com/vfx/star-wars-episode-vii-the-force-awakens/>

IPCC (2019). Special report: Global Warming of 1.5°C. Available at:
<https://www.ipcc.ch/sr15/>

Irr, C. (2017). Climate Fiction in English - Subject: North American Literatures, British and Irish Literatures, Oceanic Literatures, Fiction, 20th and 21st Century (1900-present) Online Publication Date: Feb 2017 - DOI: 10.1093/acrefore/9780190201098.013.4

Jackson, M. (2015). Glaciers and climate change: narratives of ruined futures: Glaciers and climate change, *Wiley Interdisciplinary Reviews: Climate Change*, 6(5), pp. 479–492. doi:[10.1002/wcc.351](https://doi.org/10.1002/wcc.351).

James, O., von Tunzelmann, E., Franklin, P., Thorne, K.S. (2015). Gravitational lensing by spinning black holes in astrophysics and in the movie *Interstellar*. *Classical and Quantum Gravity*, 32: 065001. doi:[10.1088/0264-9381/32/6/065001](https://doi.org/10.1088/0264-9381/32/6/065001)

Johnson, B. (November 12, 2014). No, *Interstellar* doesn't mention climate change but it could still do the problem a lot of good. Greenpeace USA (2014). Available at: <https://www.greenpeace.org/usa/interstellar-doesnt-mention-climate-change-still-problem-lot-good/> (Accessed: 6 July 2019).

Kaplan, E. A. (2015). Climate Trauma: Foreseeing the Future in Dystopian Film and Fiction. Rutgers University Press.

Keifer-Boyd, K. and D. L. Smith-Shank (2006). Speculative Fiction's Contribution to Contemporary Understanding: The Handmaid Art Tale. *Studies in Art Education*, Vol. 47, No. 2 (Winter, 2006), pp. 139-154. Published by: National Art Education Association

Kerrigan, S., Berkeley, L., Maher, S., Sergi, M., & Wotherspoon, A. (2015). Screen Production Enquiry: A Study of Five Australian Doctorates. *Studies in Australian Cinema*, 9(2), 93-109.

Kerrigan, S. and C. Batty (2016) Re-conceptualising screenwriting for the academy: the social, cultural and creative practice of developing a screenplay, *New Writing*, 13:1, 130-144, DOI: [10.1080/14790726.2015.1134580](https://doi.org/10.1080/14790726.2015.1134580)

Kerrigan, S. (2018). A 'Logical' Explanation of Screen Production as Method-led research. In Batty, C. and S. Kerrigan 'Screen Production Research: Creative Practice as a Mode of Enquiry'. Palgrave Macmillan.

Kerrigan, S. and J. Callaghan (2018). The impact of filmmaking research, *Media Practice and Education*, 19:3, 229-242, DOI: [10.1080/25741136.2018.1472466](https://doi.org/10.1080/25741136.2018.1472466)

Kirby, D. A. (2003). Scientists on the set: science consultants and the communication of science in visual fiction, *Public Understanding of Science*, 12(2003): 261-273. Sage Publications.

Kirby, D. A. (2008) *Cinematic Science*. In Bucchi, M. and Trench, B. (2008) *Handbook of Public Communication of Science and Technology*. Routledge.

Kirby, D. A. (2013). *Lab Coats in Hollywood: Science, Scientists, and Cinema*. MIT Press.

- Kirby, D. A. (2014). Science and Technology in Film: Themes and Representations. In M. Bucchi & B. Trench (eds.), *Handbook of Public Communication of Science and Technology*, 2nd edition, 2014 (New York: Routledge), pages 97- 112. (Retrieved from Research Gate)
- Kollmorgen, S. (April 22, 2015). Why Are Climate Change Docs So Boring? Because It Works. The New Republic. Available at: <https://newrepublic.com/article/121597/narrative-climate-change-films>
- Leiserowitz, A. (2004). Day After Tomorrow: Study of Climate Change Risk Perception, *Environment: Science and Policy for Sustainable Development*, 46:9, 22-39, DOI: 10.1080/00139150409603663
- Lester, L. & S. Cottle. (2009). Visualising Climate Change: Television News and Ecological Citizenship, *International Journal of Communication*, 3, 920–936.
- Lowe T., Brown K., Dessai S., De Franca Doria M, Haynes K. and Vincent K. (2006). Does Tomorrow Even Come? Disaster Narrative and Public Perception of Climate Change. In *Public Understanding of Science*, 2006: 435-457. Sage Publications.
- Macdonald, I. W. (2004). Disentangling the screen idea, *Journal of Media Practice*, 5:2, 89-99, DOI: [10.1386/jmpr.5.2.89/0](https://doi.org/10.1386/jmpr.5.2.89/0)
- Macdonald, I. W. (2013). Screenwriting Poetics and the Screen Idea. Basingstoke: Palgrave Macmillan.
- Macdonald, I. W. (2021). Originality and Authorship in the Development of the Screen Idea. In Batty, C and Taylor, S. (Eds.) (2021). Script Development: Critical Approaches, creative practice, international perspectives. Palgrave Macmillan. doi.org/10.1007/978-3-030-48713-3
- Manzo, K. (2010). Beyond polar bears? Re-envisioning climate change, *Meteorological Applications*, 17(2), pp. 196–208. doi: 10.1002/met.193.
- Manzo, K. (2017). The usefulness of climate change films, *Geoforum*; 84, pp. 88–94. doi: 10.1016/j.geoforum.2017.06.006
- Maras, S. (2009). Screenwriting: History, Theory and Practice. Wallflower press: London and New York.
- Marsh, D. and Furlong, P. (2002). A Skin, Not a Sweater: Ontology and Epistemology in Political Science. In D. Marsh and G. Stoker (Eds.), *Theory and Methods in Political Science* (pp. 17-41). Basingstoke and New York: Palgrave Macmillan.
- Marx, C. (2007). Writing for Animation, Comics & Games. Amsterdam and Boston: Focal Press.
- Maynard, C. M. and Shackley S. (2018). Framing and bias in CO2 capture and storage communication films: Reflections from a CO2 capture and storage research group. *Public Understanding of Science*. 2018;27(5):550-561. doi:[10.1177/0963662517695009](https://doi.org/10.1177/0963662517695009)

- McGreavy, B. and Lindenfeld, L. (2014). 'Entertaining our way to engagement? Climate change films and sustainable development values', *International Journal of Sustainable Development*, 17(2), pp. 123–136. doi: 10.1504/IJSD.2014.061766.
- Mcsweeney, T. (2013). "Each Night Is Darker-Beyond Darkness": The Environmental and Spiritual Apocalypse of *The Road* (2009), *Journal of Film and Video*, 65(4), pp. 42–58. doi: 10.5406/jfilmvideo.65.4.0042.
- Meisner, M. (2015). Environmental Communication: What it is and Why it matters. One-Planet Talking Point. International Environmental Communication Association (IECA), Online.
- Mellor, F. (2009). The Politics of Accuracy in Judging Global Warming Films, *Environmental Communication*, 3:2, 134-150, DOI: [10.1080/17524030902916574](https://doi.org/10.1080/17524030902916574)
- Minster, M. (2010). The Rhetoric of Ascent in *An Inconvenient Truth* and *Everything's Cool*. In Willoquet-Maricondi, P., 'Framing the World: Explorations in Ecocriticism and Film', pp 25-42. University of Virginia Press.
- Moulton, E. (2019). Crafting an "authentic" monster: Dialogue, genre and ethical questions in *Mindhunter* (2017). *Journal of Screenwriting*, 10:2, pp. 195–212, doi: 10.1386/jocs.10.2.195_1
- Moyer-Guse, E. (2008). Toward a Theory of Entertainment Persuasion: Explaining the Persuasive Effects of Entertainment-Education Messages. In *Communication Theory* 18(3):407-425.
- Murphy, P. (2014). Directing the weather, producing the climate. In Alex R, Deborah S, Sachindev PS, eds. *Culture and Media: Ecocritical Explorations*. Newcastle upon Tyne: Cambridge Scholars Publishing.
- Nerlich, B. and R. Jaspal (2014). Images of Extreme Weather: Symbolising Human Responses to Climate Change, *Science as Culture*, 23:2, 253-276, DOI: [10.1080/09505431.2013.846311](https://doi.org/10.1080/09505431.2013.846311)
- Nolan, C. and J. Nolan (2014). *Interstellar: The Complete Screenplay*. Faber and Faber.
- O'Neill, S. and S. Nicholson-Cole (2009). "Fear Won't Do It": Promoting Positive Engagement With Climate Change Through Visual and Iconic Representations. *Science Communication*. 2009; 30(3): 355-379. doi:[10.1177/1075547008329201](https://doi.org/10.1177/1075547008329201)
- O'Neill, S. (2013). Image matters: climate change imagery in US, UK and Australian newspapers. *Geoforum* 2013, 49:10–19. <https://doi.org/10.1016/j.geoforum.2013.04.030>
- O'Neill, S.J. and Smith, N. (2014). Climate change and visual imagery. *WIREs Clim Change*, 5: 73-87. <https://doi.org/10.1002/wcc.249>
- Oziewicz, M. (2017). Speculative Fiction. In *Oxford Research Encyclopedia, Literature*. Oxford University Press, US.
- Parker, P. (1999). *The Art and Science of Screenwriting*. Second Edition. Exeter: Intellect Books.

Parker, P. (2000). Reconstructing Narrative, *Journal of Media Practice*, 1:2, 66-74, DOI: 10.1080/14682753.2000.10807075. Published online: 11 Mar 2014.

Perkowitz, S. (2007). *Hollywood Science: Movies, Science, and the End of the World*. Columbia University Press.

Price, S. (2017). Script development and academic research, *Journal of Screenwriting*, 8:3, pp. 319–33, doi: 10.1386/jocs.8.3.319_1

Ramirez-Galindo, G. (2016). Could Films Help to Save the World from Climate Change? In Almlund et al., 'Rethinking Climate Change Research: Clean Technology, Culture and Communication', pp 244 - 261. Routledge. (first publish in 2012 by Ashgate)

Remillard C. (2011). Picturing environmental risk: The Canadian oil sands and the National Geographic. *International Communication Gazette*. 2011; 73(1-2): 127-143. doi:[10.1177/1748048510386745](https://doi.org/10.1177/1748048510386745)

Reusswig F., Schwarzkopf J. And P. Pohlenz (2004). Double impact: The climate blockbuster 'The day after tomorrow' and its impact on the German cinema public. Retrieved through ResearchGate.

Russell, G. M., & Kelly, N. H. (2002, September). Research as interacting dialogic processes: Implications for reflexivity. *Forum: Qualitative Social Research*, 3(3). <http://www.qualitative-research.net/fqs-texte/3-02/3-02russellkelly-e.htm>

Rust, S. (2013). *Hollywood and climate change*. In Rust S., Monani S., and Cubitt S. (Eds.), *Ecocinema theory and practice*. New York: Routledge; 2013, 191 – 211.

Rust, S. and Monani, S. (2013). Introduction: Cuts to dissolves – defining and situating ecocinema studies. In Rust S., Monani S., and Cubitt S. (Eds.), *Ecocinema theory and practice*. New York: Routledge; 2013, 1 – 13.

Sakellari, M. (2015). Cinematic climate change, a promising perspective on climate change communication, *Public Understanding of Science*, 24(7), pp. 827–841. doi:[10.1177/0963662514537028](https://doi.org/10.1177/0963662514537028).

Salvador, M. and T. Norton (2011). The Flood Myth in the Age of Global Climate Change, *Environmental Communication*, 5:1, 45-61, DOI: [10.1080/17524032.2010.544749](https://doi.org/10.1080/17524032.2010.544749)

Selby, A. (2013). *Animation*. London: Laurence King Publishing.

Shoard, C. (October 29, 2014). How *Interstellar* made Michael Caine think again about climate change | Film | The Guardian. Available at: <https://www.theguardian.com/film/2014/oct/29/interstellar-michael-caine-christopher-nolan-climate-change> (Accessed: 6 July 2019).

Sinha-Roy, P. (November 7, 2014). A Minute With: Christopher Nolan on his “*Interstellar*” challenge. Reuters (2014). Available at: <https://www.reuters.com/article/us-film-christophernolan-idUSKBN0IR18320141107> (Accessed: 6 July 2019).

Slater M. D., Rouner D. (2002). Entertainment-Education and Elaboration Likelihood: Understanding the Processing of Narrative Persuasion. In *Communication Theory* 12(2): 173-191.

Svoboda, M. (November 11, 2014). Interstellar: looking for the future in all the wrong spaces. Yale Climate Connections. Available at: <https://www.yaleclimateconnections.org/2014/11/interstellar-looking-for-the-future-in-all-the-wrong-spaces/> (Accessed: 6 July 2019).

Svoboda, M. (2016). Cli-fi on the screen(s): patterns in the representations of climate change in fictional films, *Wiley Interdisciplinary Reviews: Climate Change*, 7(1), pp. 43–64. doi: [10.1002/wcc.381](https://doi.org/10.1002/wcc.381).

Svoboda, M. (2019). Superheroes and aliens: Climate change in the movies in 2018 - with a preview of 2019. Yale Climate Connections (online). <https://www.yaleclimateconnections.org/2019/03/climate-change-in-the-movies-in-2018/>

Trexler, A. (2015). *Anthropocene Fictions: The Novel in a Time of Climate Change*. University of Virginia Press.

Taylor, S. and C. Batty (2016). Script development and the hidden practices of screenwriting: perspectives from industry professionals, *New Writing*, 13:2, 204-217, DOI: [10.1080/14790726.2015.1120314](https://doi.org/10.1080/14790726.2015.1120314)

Thorne, K. (2014). *The Science of Interstellar*. New York: W. W. Norton & Company.

The Video Effect. (2020). Understanding online video attention span. <http://thevideoeffect.tv/2020/06/online-video-attention-span-how-long-should-a-video-production-be/>

Watt, D. (2007). On Becoming a Qualitative Researcher: The Value of Reflexivity. *The Qualitative Report*, Volume 12 (1), March 2007 82-101. <http://www.nova.edu/ssss/QR/QR12-1/watt.pdf>

Webb, D. (2018). Screen industry collaboration: The Knock – producing fiction with Creative England/BFI, *Media Practice and Education*, 19:2, 173-187, DOI: [10.1080/25741136.2018.1469355](https://doi.org/10.1080/25741136.2018.1469355)

Weik von Mossner, A. (2011). Reframing Katrina: The Color of Disaster in Spike Lee's *When the Levees Broke*, *Journal of Environmental Communication*, vol 5, no 2, June 2011.

Weik von Mossner, A. (2012). The human face of global warming: Varieties of eco-cosmopolitanism in climate change documentaries', *Revista Canaria de Estudios Ingleses*, (64), pp. 145–160. Available at: <https://dialnet.unirioja.es/servlet/articulo?codigo=3881499> (Accessed: 2 August 2018)

Weik von Mossner, A. (2013). Troubling spaces: Ecological risk, narrative framing, and emotional engagement in 'The Age of Stupid', *Emotion, Space and Society*. (Emotion and Ecology), 6, pp. 108–116. doi: [10.1016/j.emospa.2012.02.003](https://doi.org/10.1016/j.emospa.2012.02.003)

Wilson, Kris M. (2000). Communicating Climate Change through the Media: Predictions, Politics and Perceptions of Risk. In 'Environmental Risk and the Media' by Allan, S., Adam B. & Carter, C. (2000). London: Routledge.

Woolley, A. (2014) "'There's a Storm Coming!': Reading the Threat of Climate Change in Jeff Nichols's *Take Shelter*", ISLE: Interdisciplinary Studies in Literature and Environment, 21(1), pp. 174–191. doi: [10.1093/isle/isu036](https://doi.org/10.1093/isle/isu036).

Filmography

An Inconvenient Truth. Scr Al Gore. Dir Davis Guggenheim. Participant Media Productions, USA. 2006.

Chasing Ice. Scr Mark Monroe. Dir Jeff Orlowski. Submarine Delux, USA. 2012.

Contact. Scr James V. Hart. Dir Robert Zemeckis. South Side Amusement Company, USA. 1997.

Erin Brockovich. Scr Susannah Grant. Dir Steven Soderbergh. Jersey Films, USA. 2000.

Flashdance. Scr Tom Hedley and Joe Eszterhas. Dir Adrian Lyne. PolyGram Filmed Entertainment.

Geostorm. Scr Dean Devlin and Paul Guyot. Dir Dean Devlin. Warner Bros. Pictures, USA. 2017.

Interstellar. Scr Jonathan Nolan, Christopher Nolan. Dir Christopher Nolan. Syncopy, UK and Warner Bros. Pictures, International. 2014.

Kingsman: The Secret Service. Scr Jane Goldman and Matthew Vaughn. Dir Matthew Vaughn. Twentieth Century Fox, USA. 2014.

Mad Max: Fury Road. Scr George Miller, Brendan McCarthy, Nico Lathouris. Dir George Miller. Warner Bros. Pictures, USA. 2015.

Manufactured Landscapes. Dir Jennifer Baichwal. Zeitgeist Films, Canada. 2006.

One of Us. Dir Ewing and Grady. Documentary. Loki Films. 2017.

Take Shelter. Scr Jeff Nichols. Dir Jeff Nichols. 2011.

The Age of Stupid. Scr Franny Armstrong. Dir Fanny Armstrong. Spanner Films, UK. 2009.

The Dark Knight. Scr Jonathan and Christopher Nolan. Dir Christopher Nolan. Warner Bros. Pictures. 2008.

The Dark Knight Rises. Scr Jonathan and Christopher Nolan. Dir Christopher Nolan. Warner Bros. Pictures. 2012.

The Day After Tomorrow. Scr Roland Emmerich and Jeffrey Nachmanoff. Dir Roland Emmerich. Lions Gate Films, USA. 2004.

The Dust Bowl. Dir Ken Burns. PBS, USA. 1990

The Fisher King. Scr Richard LaGravenese. Dir Terry Gilliam. Hill/Obst Productions, USA. 1991.

The Great Global Warming Swindle. Dir Martin Durkin. Channel 4, UK. 2007.

The Making of Interstellar. Special Features. In *Interstellar*, Blue Ray, Syncopy, UK and Warner Bros. Pictures, International. 2014.

The Prestige. Scr Jonathan and Christopher Nolan. Dir Christopher Nolan. Touchstone Pictures, Warner Bros. Pictures, Syncopy. 2006.

The Revenant. Scr Mark L. Smith and Alejandro G. Inarritu. Dir Alejandro G. Inarritu. Regency Enterprises, USA. 2015.

The Road. Scr Joe Penhall. Dir John Hillcoat. 2929 Productions, USA. 2009.

When the Levees Broke: A Requiem in Four Acts. Dir Spike Lee. 40 Acres and a Mule Filmworks, USA. 2006.

Wind River. Scr Taylor Sheridan. Dir Taylor Sheridan. Thunder Road Pictures, USA. 2017.

APPENDICES

Appendix A

Interview with Prof. Kip Thorne (08/02/2018)

By Michela Cortese

MC: I'm going to start with a very general question. If you can walk me through the film from your perspective. How did the idea come up?

KT: The environmental aspect of this film was not Christopher Nolan, it was Johnathon Nolan's. John is Christopher Nolan's brother and he wrote the first three drafts of the film.

Briefly, the story of this film began in 1979 when Carl Sagan introduced me to Linda Obst, who is a movie producer, who was just beginning her career in Hollywood. He set us up on a blind date and we became good friends. Then in 2004, she proposed that we brainstorm a movie, we gave it the name *Interstellar*, we wrote a treatment for the film. In our case a treatment is a little different from a typical treatment in that a significant amount of the treatment is the science. In our treatment, it came to be about 40 pages and about 25 percent of it is the science, so a lot of the science was integrated into it. She brought Steven Spielberg on as the director during the creative phase and two of them brought Johnathon Nolan on-board to write the screenplay. He was about 31 at the time, had written the screenplay or co-authored the screenplays for his brother's film and I think they had been nominated for an academy award for the story in one of his brother's movies. But he had very little experience but since then he's become a major figure in Hollywood.

And so, he took our treatment and in close consultation with me, he developed the first three drafts of the screenplay and he changed the first half of the movie greatly, he introduced in the first act of the movie, which is the period - well as you know, in screenplays you don't spell out where an act ends but the screenwriter and the people developing the picture have a clear picture – where's the first act, where's the second act, where's the third act – the first act is the segment on earth before they go into space and he developed the story for the first act which was enormously changed from what Linda Obst and I had but the science was the same.

And he introduced the climate issues. The climate issues were never an issue of climate change, although they might be interpreted as that. His idea from the outset was a blight that was what biologists called a lethal generalised blight that was destroying systematically all the crops that we depend on for food. And so, so that's where that comes from. There was a brainstorming session with a handful of biologists who understand these biological issues that

I described in my book which much influenced what we had with regard to the blight and the climate issues.

Spielberg carries a lot more movies in the creative phase than he can possibly make and he had a choice basically between making *Interstellar* and making *Lincoln* and he chose *Lincoln*. He dropped *Interstellar*. Before he dropped it, Christopher Nolan told us he was interested in taking over if Steven dropped out. But Chris refused to negotiate any details about taking it over until he finished *The Dark Knight Rises*. So after that was finished, he negotiated and took over and he himself wrote the last three drafts of the screenplay - he did not change the first act, which of course is the portion that interests you, very much but he did change the second half of the movie greatly so it became largely his movie. But throughout the entire process I worked hand in hand with both Nolan brothers on the screenplay in making sure the science we began with was still in the film and integrating new science into the screenplay and I worked very closely with the computer graphics team at Double Negative in London on the graphics. I consulted with the four lead actors on the science on their parts in the film and so forth.

MC: Thank you, that's very interesting. I'd like to go back a little bit. Could you tell me a bit more about the development of the treatment from your perspective?

KT: Let me say that my partner on this was Linda Obst. Linda has produced *Flashdance*. It was her first film, *Flashdance* was her idea. She was the original creative producer on *Flashdance*. She was the producer of Carl Sagan's *Contact* and worked very closely with him on *Contact*. She did *Fisher King*, *Sleepless in Seattle*, *How to Lose a Guy in Ten Days*, *The Art of Lying*. She's one of the major producers in Hollywood at least one of the major female producers in Hollywood. Doing this film was originally her idea but obviously the science came from me so we wrote the film together.

So initially we started to brainstorm. We didn't have anything in terms of a treatment except some email exchanges between us at the beginning. Then she spoke with Steven Spielberg's agent. His agent wanted to know what movie she was thinking of making. She described this movie and some other ideas. His agent said Steven will be interested in *Interstellar* and so the agent went and talked to Steven. Steven telephoned her and asked her if she could have a treatment on his desk by the end of the day today. She said no, but I'll get you one by tomorrow. So, she threw something together based on our email exchanges and our conversations which was eight pages long and she sent it to him. He responded and said I think

I would like to make this movie. And so “can you give me a more detailed treatment?” and that’s when we wrote the more detailed treatment.

MC: Did you find it an easy collaboration?

KT: There was never any struggle. You have to understand that Linda and I had dated for about 2 or 3 years. I married someone else, but we remained very close friends. She’s a close social friend of me and my wife, so these were close friends deciding to do something together. She was a science editor for the New York Times magazine before she came to Hollywood and so she understands a lot of science and she has interacted with scientists. She was a foreign language producer for Carl Sagan’s *Cosmos* television series so much of her social and intellectual life has been in contact with scientists. So, from that point of view the foundation was there for it to be an easy and enjoyable collaboration.

MC: After the treatment, what was your involvement?

KT: So, I have to say, we went through a number of drafts before it went to a screenwriter. Linda and Steven Spielberg, they interviewed potential screenwriters for close to a year before they chose a screenwriter. During this period, we were still perfecting the treatment. When the two of them chose Johnathon Nolan as the screenwriter, then we turned over a 40-page treatment to Jonah (Johnathon Nolan). And then he, as a first step, before he started work on the treatment, we met and had long discussions and we agreed that I would feed him things to read that were relevant. And so, for several months, something like three months, he spent a large portion of his time reading science books, semi-popular science books about the relevant science that was relevant for the movie. And only after that did he start work on the screenplay.

MC: Were you involved in the screenplay, giving advice?

KT: Jonah and I met roughly every other week for several years, at least during the periods that he was actively working on the screenplay. While he was working on it we would meet at the faculty club at Caltech and we would discuss science issues in the screenplay, brainstorm together and throw ideas back and forth. This often led me to write documents that I would send to him about the science issues that we had been discussing. I would go off to do calculations and write documents, perhaps a three-page document about pieces of science for the movie. So it was a collaboration in that sense.

Similarly, when Christopher came back on board and started working on the screenplay, similarly, we had these discussions every two weeks. Each draft of the screenplay they would give to me to go over it and give notes and feedback on it so every draft of the screenplay I gave notes that could be many many pages long.

MC: So, big involvement. Was there any point where you felt some parts weren't included in the overall script? Coming from science?

KT: Typically, what we were doing is we were looking for science ideas and how they would go into the film. And I didn't have views as to how they were incorporated into the story but it was a brainstorming in search of science ideas.

The only thing of the sort that you are describing is that we began, I don't know if it was my idea or Jonah's, was a prologue for the film that involved the discovery of the wormhole. The prologue, the wormhole is discovered because LIGO, do you know about LIGO?

MC: No.

KT: LIGO is a project to search for gravitational waves coming from the distant universe. It ultimately succeeded a few years after the movie came out. I won a Nobel prize for that work. So, this was before the success and Jonah and I had a prologue in which LIGO discovered gravitational waves but they came through the wormhole and by triangulating with the gravitational wave detector on the location of the source on the sky, the LIGO scientists discovered that the waves were coming from the vicinity of Saturn and deduced that they were coming from a wormhole.

When Christopher came on-board he decided very quickly that he was going to remove that prologue because we weren't using gravitational waves anywhere else in the film and he didn't want to confuse the readers by having too much science as he wanted to introduce some additional science. So, I didn't argue with him. It was reasonable because gravitational waves weren't being used and so I just let it go.

Three days after we announced the discovery of gravitational waves, he telephoned me and asked me to come over to Warner Brother's Studios where he was in pre-production on *Dunkirk*. He spent an hour and a half talking about how he regretted having removed LIGO and gravitational waves from the film and how he could have incorporated them into the movie. Then he said, "there's no looking back and we have to go forward."

MC: The environment was introduced by Nolan. You had meetings with biologists?

KT: To get the best science we had several workshops, this is something that Linda Obst has generally done with her science related movies. So, we set up one day workshops early when we were working with Spielberg. He came over to Caltech near my office and we brought in 20 scientists from around the world who were experts on the relevant science in the movie. We spent a day brainstorming with them. That was earlier.

On the issue of the climate issues, the environment issues, the blight, which was Jonah's idea, we set up an evening workshop where I work and we brought in the best experts related to biology that could have catastrophic effects on the earth. So, we had something like five biologists, all from Southern California. We spent about 4 hours drinking wine, eating and talking and recorded the conversations. In my book, *The Science of Interstellar*, there's a chapter, segments from the transcript from those conversations where the biologists were brainstorming about things that could go wrong that could cause great problems for humans and make the Earth not liveable for humans anymore. Climate change was not among them because we were focusing on something that could happen rapidly on a timescale of a hundred years. So, you'll find in my book the most interesting details of that conversation and then if you look in my book you will find endnotes associated with that conversation that described the technical details for people who know a little bit of science, quantitative details of how these things could arise. So anyway, that was used to form a scientific foundation for the environmental issues in the film and to underpin the idea for blight. The idea of the blight was Jonah's but understanding whether such blights could occur, what their relationship is to the best scientific understanding of blights and what other things could be going wrong in the environment to underpin some of the dialogue in the film, that is all treated in that chapter.

MC: You mentioned there was a misinterpretation?

KT: The word 'climate change' is not used in the film. It has been interpreted by viewers and reviewers that it is climate change, but we never intended for it to be. There is a big difference between climate change and something that could happen in a hundred years. We were focused on things that could really go wrong very rapidly. So that was the big difference.

MC: That was really helpful for me.

KT: I don't think we have any objection to people interpreting the film that way, after all it is a movie intended to entertain and inspire and my goal in this movie as a scientist was not so much to educate the viewers about science as to inspire them and to make them think about science. So, from that point of view, I'm not troubled if its misinterpreted as climate change.

In fact, it was never intended that way and if you look closely at the film, it isn't depicted that way.

MC: Your thoughts about the power of fictional films?

KT: My viewpoint is somewhat parochial; I have my own view on these things but it's based on my own experience and where I'm going with my own career. With *Interstellar*, my goal was to inspire people about science and about science issues. Then I thought at first, we would do a documentary about the science in the movie, in order to inform and educate, but in the end, I chose instead to do a book where I could go into things more deeply and more carefully and have more control of my own. And so, the combination of *Interstellar* to inspire and my book about the science of *Interstellar* to educate was the route I chose to go. But it was clear I could have a much bigger impact on the general public with regard to the science through this movie than I could through any documentary. And I felt in the end I could impact a smaller number of people but have a much more effective impact on education through the associated book.

So, in the case of *interstellar*, the total ticket sales were about 700 million dollars, roughly 150 million people saw this movie. There's no way any documentary could ever reach that many people. In Korea, after the film came out, I was asked to speak at the Seoul Digital Forum. The first speaker was the president of Korea, the second was the secretary general for the United Nations. I was the third. It was televised across the country. I was told that in this country of 50 million people, 10 million people had gone to see the movie, 20 percent of the population. Because the government was promoting it as part of their overall policy to educate the citizens of Korea about science and technology, about its power and importance.

In China, the impact was similar, maybe not that huge, but very huge. Less so in the United States and other countries. But the impact in terms of inspiring people about science overall around the world was really very big compared to anything I could have done in any other way.

MC: Were you involved in anything else?

KT: I was involved primarily in the computer graphics. They were done by a company called Double Negative which is based in London. Paul Franklin, who was the supervisor for visual effects, got both the BAFTA and the Academy Award for the visual effects in the film.

All the effects related to astrophysics were based on solving equations that came from Albert Einstein for the propagation of light around black holes and wormholes and I spent

about three months full time working with the team at Double Negative, deriving equations for them to use to do computer simulations to produce all of the visual effects that you see in the film.

We even had to invent new methods of doing simulations because for light propagating near a black hole gets so distorted that the images were badly flawed if you used the standard techniques used by everyone both in astrophysics and the movie industry to do simulations and make these kinds of images. So, we had to develop a entirely new set of computational tools for doing this.

These are described in a technical paper in a journal called Classical Quantum Gravity which is a collaboration between the computer graphics company and me. Those techniques which are an outgrowth of this movie are now being used in other Hollywood movies and by Astro Physicists.

Let me also say during production at the beginning of filming, I met at their request with Matthew and separately with Anne Hathaway, two of the stars, to discuss the science in the film and their roles in the film. So, we had long discussions with them. On set I met and had discussions on set with Michael Caine and Jessica Chastain who play theoretical physicists.

While I was on set with them, the first assistant director came over and said that Michael wanted to have his picture taken with me so I was quite surprised. So, we did and then an hour later his wife arrived and sat next to me while they were filming and she said that Michael called and said that she should meet me. I asked her why, and she said Christopher Nolan had told Michael that his role had been patterned after me which I didn't know.

MC: Can you share anything that you think helped the actors?

KT: I don't think so. I think they wanted to understand better the science that was involved and they wanted to understand how scientists think. So, it was them asking me questions, it wasn't me feeding stuff to them particularly. It was them trying to understand the characters they were playing more deeply. So, it was that kind of conversation except with Anne Hathaway who it turns out - she calls herself a physics geek and she asked me questions I never expected to be asked. She was well informed. Jessica Chastain on the red carpet at the world premiere in Hollywood, the only thing she talked about was working with me and how wonderful it is to play a theoretical physicists and work with me on the film. The lovely thing is that everybody on this film was really enthusiastic about doing a movie about deep and interesting science.

MC: What else did you do?

KT: The only thing in post-production was the issue of some of the computer graphics. There's a trip through the wormhole in the film and the wormhole had been designed to make it interesting viewed from the outside in terms of the mathematical design of the wormhole, but when they then did the computer graphics solving the Einstein equations for the propagation of light when the crew was travelling through the wormhole it was not a very interesting trip it was a pretty boring trip through the wormhole so Nolan called me up and told me to come over to his house. He does his post production in his home. He said we have a problem. He showed me the, simulations, the visuals which were produced by the solving of the equations for the trip through the wormhole when they changed the shape of the wormhole in many different ways. And it was never very interesting. So that was the one and only point in the movie where it diverged in a strong way from the real science. We had a discussion of what to do and he made a decision in consultation with me and Paul Franklin who was his VFX supervisor to combine the videos in an interesting way for trips through different shapes of wormholes and then use some artistic license to distort them and make them more interesting. The only place where it deviated significantly from the real science. That was a post-production issue. We all agreed on it. The way that I worked with Nolan was a real collaboration and brainstorming together and searching for things that worked well. Each of us bending on issues by mutual agreement when a problem like this arose.

MC: He always checked with you if you agreed?

KT: In the end, of course it was his decision, but he did not make them without consulting with me and in all cases, we reached agreement.

MC: A fair way of working together.

KT: Yes.

MC: Anything that didn't work very well? Anything you think should be done differently?

KT: I think we had no choice. I think the trip through the wormhole was handled as best as they could handle it and I was perfectly happy with. There were few other very minor things that nobody else would notice. There's an ice planet where a segment where an ice cloud and a space craft travels through and around. The wings of the spacecraft clipped along the edge of an ice cloud. That kind of cloud could not really hold itself up against the strains it would have

due to its own weight in that particular shape, but nobody except a real engineering expert or geophysicists would know that and this is one scene that lasts for about two seconds.

I noticed it from my point of view but nobody has ever commented on that. There are a few minor things like that that weren't of any great importance but I would have done differently but I didn't actually see until it was too late.

In this case, we worked very well together, and the compromises were things we worked out together but the movie is so big and complex there are pieces like that piece that I didn't see until it was too late to comment and suggest changes. They are tiny things that don't amount to much. But you asked if there was anything I was unhappy with and so here they are. I wasn't consulted and they didn't think to consult me and by the time I saw it was too late. But they were very minor things.

MC: The overall goal was achieved?

KT: Very much so. I think from my point of view it was tremendously successful.

MC: How long did it take?

KT: I think we did our first brain storming in 2004. The film came out in 2014 so ten years.

MC: Were you involved in anything else?

KT: I advised on small amount on *Contact*, which was Linda Obst and Carl Sagan's film, and I have a movie which is in the works at the moment where the treatment is written by Stephen Hawking, Linda Obst and me. The screenwriter is doing a second draft of the screenplay we're doing it the same way – so brainstorming together. It's a different film, different director, different studio and different screenwriter. And the treatment, we brought Stephen Hawking onto the film as a third author.

MC: I imagine it's an exciting journey. Creativity is always there...

Notes from follow-up email by Prof. Kip Thorne (20/09/2021)

Thorne, Kip S.

From the outset, it was a blight (introduced into the screenplay by Jonathan). Only after our workshop with biuologists did we make it into a lethal generalized blight.

Thorne, Kip S.

Thorne, Kip S.

I thought the screenplay and movie were clear that the issue was blight and not climate change. Nowhere in the movie was the phrase climate change ever used. The word blight appears four times.

Thorne, Kip S.

There was no "shooting script" for Interstellar as distinguished from Jonathan's script. Both Christopher's script and Jonathan's script had the same organizational structure. There were no shooting instructions inserted into Christopher's script to distinguish it from Jonathan's script.

Appendix B

Interview with Dr Enrico Andreoli (23/03/2018)

By Michela Cortese

MC: Okay, Enrico, this is a very simple interview. I'm going to ask you to go back and understand a bit more of what the process was for making the film – from your point of view. Could you start with from the beginning how you got involved in this project.

EA: Yes. The very start of the project is me applying for funding and realising the importance of communicating science and being able to impact beyond work that we do in the laboratory.

MC: Where did we meet?

EA: That was the key element for sparking our discussion – when we met in Bangor. I was in Bangor to visit the energy cohort (insert name) funded by the Welsh government to help SME's in taking their business beyond their standard activities. So, doing research.

It was an interesting meeting, and then when we were there, we met – and we started a discussion – your interest in climate change communication and your expertise in media and journalism – at that time, me applying for research funding – I'm a chemist, specifically for engineering materials, but at the same time a very _____ of UK government sponsored research – it's impact. One is communicating to the public. There are many ways of impacting with the research beyond the academic impact and the actual research, but reaching out to people interacting with politicians, commercialisation of what you do – they are all pathways to impact. One that they were very interested in to communicate the research I am doing to a wider audience but following unusual – I really think what we did was unusual. I've never seen anything like what we did anywhere – in an unusual way, the significance of research. When you told me that you were interested also, we started considering the possibility of producing a short film. And then you did everything.

MC: When you met me, were you already in the process of applying for the funding?

EA: Yes.

MC: You were already in the process, and you met me, and you thought it would be good to include me.

EA: Absolutely. That said, I didn't have a clue in the potential there was in anything we could produce. It wasn't planned, based on having experience already and knowing the potential for the work. The spark was this idea of communicating importance of what I do to an audience, without being aware of how to do that.

MC: You were applying for funding – you knew at some point you wanted to do something to research to the public, but you didn't know what to do.

EA: Exactly. Usually, when you communicate with people, at least in academia, it's common to have outreach activities that we do. For example, Swansea Science Festival or the Oriel Science Festival – so now we have a booth where we take the public to experience the idea of transforming carbon dioxide, going around tables and doing the chemistry and explaining it to them.

MC: This is face to face.

EA: Yes. It's very standard. It's extremely important, you have to know what you are doing and do it well. But it was standard, and I hoped there was the chance to do something unique. And then I met you.

MC: When we said yes, let's make a film together – what did you do at that point?

EA: At the application I specified clearly that there was an intention to produce a film, short film covering climate change carbon dioxide specifically – it's why I insisted that carbon dioxide would be there. So, I wrote to Pathways to Impact that, if I got the funding, I would be working with you. I specifically named you and said we would be working together because of your expertise to produce this film. This ended up in the application.

MC: You were taking care of securing the funding. Was that the only source you applied to?

EA: Now that you remind me. There was another opportunity – the NRN – national research network of Welsh government on advanced materials and engineering and I'd been talking to the manager of that network and he was also very much willing to find something that wasn't available anywhere and when I met with him, maybe after we met, I told him about this opportunity and he was very interested, something he was looking for his outreach activities. He was very interested in getting involved.

MC: Okay, so you had two sources of funding for the project. And then, we started together brainstorming after that to settle on an idea that could work for the film. Could you remind us of this exchange of information?

EA: We were talking on skype mainly through skype, some emails. That was the way of communicating. From my side, the experience was – the creative part and the key idea of Tradition and sustainability came all from your part – so the way I see myself in this process was trying to imagine what you were putting on the table in terms of how it would look and how it would correspond to what the expectation of the funder was.

MC: The expectation of the funders –

EA: You had many ideas, and now I am extremely amazed by what you were able to do. We had an important meeting for a very big project, a multimedia project, my boss who is the key person on the project, he wanted to show the video to all these important people who came. He finds it very nice. When the video stopped, I thought, this idea of tradition and sustainability, I immediately referred you to him because I don't want this to feel... For me it would have been impossible to imagine it until I saw it. How would I justify it to the funder if they came back and wanted to cut it shorter? Instead the use of the wall, the use of the images, it's very new at least for us for engineers. Chemists and Scientists – for us, these things we can't see them. It's not our work. Now, having had this experience. to go through this again, I might be able to formulate a view of the idea, but going back to the question –

MC: How did it happen?

EA: Me, I was someone – let's cut it short – a passive observer of information – perhaps from your side I was active, but I felt more like someone who was blind being taken by hand through something new. Where my main target was 'let's do something more creative, but not too much because then what would it be?'

MC: So, I will tell you what I remember about two ideas that we had at the beginning, because this links to what you just said. So, we were dealing with energy but also material, because that's what you worked with, to understand this material better and see how you can use it. It's very experimental what you do, it's not just climate change. We made it work for climate change because there is no bigger topic which is energy consumption, when you talk about climate change – there is nothing bigger than that for society, which is what we are really concerned about. But in the beginning, first, we had an idea of a kid working with material –

We had the idea of kid playing with some material and making something out of it. We didn't go through with it – can you remember why?

EA: No.

MC: The idea would be that the kid was playing with some objects, taking something from his mom, his grandfather and taking these objects and making something in his room. That idea was good for material, but it didn't fit with the overall – the second idea we came up – always because we were concentrating on material, we were thinking about fishing and ropes, but you told me no, it wouldn't work. Because you reminded me that there were issues to the environment that fishing does to the environment.

EA: My memory is not very good.

MC: I remember you telling me that you were scared that if we did that visually, it would be perfect to talk about material, but it wasn't good because people can associate fishing as something that is ruining the sea.

EA: I understand.

MC: So basically, the ideas we had at the beginning because we were concentrating on the material, weren't working – I remember when we were talking, all these ideas weren't working for some reason. But when we switched from material to the bigger concept, which is what we did at the end – so I think what was interesting working with you, is even at the beginning you wanted me to focus on material, every time I or you came up with something, it didn't work. So then, we settled for sustainability which is a bigger concept, and tradition, which is a bigger concept, and inside that, I used food – the kid picking up the tomatoes, and the tomatoes, if we do a systematic analysis – the tomatoes remind us of the typical representations of carbon dioxide, bubbles – there was a lot of work. We included everything, but I think what I learned is that actually, when we were trying to the material part, it wasn't working.

EA: For me, on my side, I was receiving these ideas that you elaborated, and was wondering always – a very important part was, when I communicate the work I do to the public, rather than to tell them - I wouldn't tell them the taste of the materials I used, because there is no point – it's the use of it – the impact –

MC: I think this is something that we both learned and changed. Because originally –

EA: Oh yeah. What you brought to be considered, was necessary for me also to realise that the key information to give – what is important for the public to know about what I do – is not what I do, it's the importance of it. The material is what I do – I should communicate what the material is used for. That is the learning experience I went through. When we focused on the materials, I realised, this is not what I should tell the public. When we moved to less about sustainability then, because of your idea, tradition, now for example, you made even clearer, the beauty of the movie to me – the tomatoes is carbon dioxide. The tomatoes grew and converted carbon dioxide to what the tomatoes is. If you look in between the lines, in the tissue of the movie, there are so many information – these things should be written somewhere. Even me, I was involved in it, and I work with CO₂, but I need you to show this to me. Getting back to the communication - We shifted from the material to a larger picture because something that I thought should be communicate, wasn't important to be communicated.

MC: It was the same from me, to learn – because that was my first time communicating science visually so before that I was only expert in writing, but not really doing visual work in that sense. I learned that despite all those great ideas that we had, and I still think that I remember I had a very strong idea with ropes and things – and I had a clear narrative which would have represented very well some part of it, but I understood that because we got money from people, we needed to be careful. You were very concerned what those people would think.

EA: Yes, because I was concerned, rather than what people would think, but when you apply for funding you set a list of what you deliver. And then they come and ask you where are these things? I wasn't worried, but I was willing to deliver something what I told them it would have been. When I wrote it down, it was to communicate the importance of CO₂ catalyses – the. Transforming of CO₂ in making of fuels – and in the material side, although I was making materials to realise this, I couldn't see this emerging – so it was about making something that was focused on materials, but when I watched it, would it correspond with what I told them it would be. So that was one of the guiding parts of my side. If you are a film director, before they give you millions, you have to convince the investors of what it is. If it is just an idea, I don't think they will invest millions in an idea. Here we are talking about nothing in terms of money.

MC: We had a narrative, which was converting CO₂ fuel with renewable energy to make a new source of energy, a sustainable one, but the beginning, we were trying to do converting CO₂ to fuel with renewable energy, concentrating on the act of importance of doing that, but

we weren't going into sustainability, which we did in the end – we conveyed sustainability because we were talking about food and the land and vegetables. Then we included CO2 energy and all that through text. So what I was trying to do instead, was the other way around, visually communicating what we wrote – instead we did the other way around – visually communicating the bigger picture which was the environment, cooking and then we added the text to make the link. So that was the outcome. I'm telling you to see what you remember of that. This is what I remembered, and I remember there were a lot of struggles with the funding –

EA: Very much pain, and then your entrepreneurial abilities brought in Paulo, his gigantic work went beyond what we could actually afford to get it shot. That was a fundamental part that you brought in –

MC: I will tell you also, something that is good for you and me, in the article that was published – the one thing that we didn't have, is that we didn't have money for pre-production images – we didn't have storyboarding, an artist that could do that – we didn't have previsualisation like what they do in Interstellar – what I realised that no matter what I do in the future, but money will have to be saved and spent for this. Because, I had something in my mind, but it was difficult to make you see that. It may be difficult for someone else to look at that idea. Especially, it was difficult for me to make you see what I see because I didn't have a way to do it.

EA: I agree with these –

MC: That was an issue. I remember as well when I said “Enrico, I'm going to do it like this now”, because I remember so many ideas that either me or you said no. At the end, even when I told you about this, you didn't ‘see it’ until the end. It was a risk, because you didn't know.

EA: The only way to communicate in this way is to visualise. If I was going to go for money like this again, I would definitely put in money to visualise. It's the only way to really see where you are going. Honestly, I never knew because I had never been through it.

MC: I've been through the process of being involved in making something visual, but I underestimated that with you, I wasn't working with an artist, but with a scientist, and I needed that previsualisation – pre production.

EA: If you are going to collaborate with another scientist, you need a good person to visualise. From my side, and I would say among engineers, I am a visualiser, if I had all these struggles, I can only imagine what other go through.

MC: When I interviewed Kip Thorne, he wrote a treatment which was very long which he wrote with a famous producer, his best friend. She produced the film *Flashdance*, *Contact* etc. Lynda and Kip, worked with a treatment and the first person who got it was Spielberg. He liked it but went on to do *Lincoln*. When he went to Christopher Nolan, ten years was spent to go into production. Four years to go into production. A very long time, almost five years, just visualising and working on the script. Christopher has a brother Jonathon Nolan, and Jonathon Nolan was with Kip Thorne every day rewriting, rewriting the script and then Christopher Nolan took it and rewrote it. What I learned was previsualising a lot. The chance to meet face to face, they had many meetings with the writer, other biologists and other people he brought in – I think this was just done at University level before they went to Hollywood. The one thing I saw, we had no pre-production stage. Just production, post production – John edited the film. We had brain storming sessions but we never produced any storyboards or anything. And so, in a next project, which is what I wrote in the chapter that was published, I recommend that any scientist going through this, to save money for this.

EA: You would bring a third person for the visualisation?

MC: It could be an expert with storyboarding, but it could be done with computer design. Somebody to help me and you visualise what we think?

EA: That is fundamental. It is a tool to facilitate the process of creativity.

MC: We have to say, people don't do, but we did – people settle for documentary, we made a lot of work that it isn't just going to interview people. It was a narrative so it was harder.

EA: Also, because you are strong lead on that I would say, I didn't want to use a documentary because it was pointless. You wouldn't step back once on the idea to something creative where narrative – where you use narrative to engage the viewer, not in the transfer of information but in the emotional experience. You have always been strong on that, that's what I found most promising – to use narrative, images and then we turned to words. The beauty of a movie is to live something – we see the life of this kid growing up, reexperiencing tradition and realising that it every single step is an opportunity to do something new and that's how I see the movie. So yeah, visualising is fundamental and this leads on not doing the documentary – this comes

from you and I always supported it. I never said no, let's do a documentary because I can see through – I was prepared to do a leap of faith and say, even though – but I trusted you very much because of this idea and unique from an engineering point of view.

MC: You were unique as well because not many scientists want to do that.

EA: The manager of the group here could not find anyone –

MC: Think that our project was very small in terms of money – I'm trying to make a connection as well – what was similar with what we did and Kip Thorne and Christopher Nolan is that Kip Thorne said, because that's before he won the noble prize – he wanted to make a film about his research but what he wanted was about doing something that make people excited about that research. He wanted to make people excited about science – something that they could remember, not because it was black holes, but because it was something they experience – he said they proposed to do a documentary many times and he said no – he said, I want to do a fiction narrative, because there are books to read about that stuff, but for the audience or people who don't read the books, we make something different. He had to negotiate, because sometimes he wanted to do somethings and Christopher Nolan would say, it's good for the science but not for the film. I think the principle of what we wanted to do was the same – not to do a documentary but something that people would remember. So it didn't matter if people didn't learn all the little things you do in the lab, but they will remember the 4 minute film because they will remember the story of it. That's important because when you communicate to the public, not to your colleagues who know, but when you want to communicate to the general public, you can't be specific like you would in a conference, I think.

EA: There wouldn't be anything to communicate to the general public, because it is so specialised, but that's not the point. Focusing on the value of it, and how you can measure value? You compare numbers, or value emotion? The importance of valuing emotion is you can reach much more than comparing numbers – to be exposed to an emotional experience is different – you experience it – that's what I found most valuable to the approach. Now I also talk with the post-production – now that I know the value of the film, I am even more convinced of that.

MC: We did the best we could with the budget of that. Thank God we had Paulo. Any comment regarding something you would change or do differently?

EA: The only experience to do differently – I say something obviously, to see this before it was made. Something else? I am satisfied with how things went – probably what I would have liked is to have more time and to bring in more – okay, to be different next time, my feeling in this project, I contributed, but I felt like I keep two people walking along the pathway and keeping people in the same direction, and with you a lot of the ideas were leaving me confused. So, more time to feel less lost – so what I would change is more communication with a greater contribution on my side of the creativity. The problem is anybody embarking on a project like this must have be a creative person. They can do it. What I would like next time is to engage more on the creative process. You did a lot of work but on my side, with more time I could have done more, but with visualisation.

MC: I always think that to do science, you need imagination.

EA: Mine is in the habit of seeing the atoms moving. You need creativity and imagination, but it's a different toolkit. Absolutely, you need imagination – because when you apply for ground-breaking project, you need to visualise from a scientific point of view for things that don't exist. But that's different how you communicate – it's not visualising what you might think will happen in a container. How do you visualise something that is to communicate -- to be honest, after this experience, when I watch a movie, it's incredible what they can do. To make a film, it's gigantic, it's incredible.

MC: That's why it took two years for us. And for something like Interstellar took 14 years.

EA: And then you go and you watch it, it's incredible but I don't think people are aware of how much work goes on. So much writing, thinking and imagination.

MC: We did what we could with the money and the time, but in the future, I would like that if an opportunity comes again, I would never go without the money to bring in people – John is a very great editor, and Paolo is a great cinematographer. But we missed someone who was helping you and me.

EA: If this was all to be funded from scratch, without all the work you took off from John and Paolo –

MC: Paolo told me what we did is very much like an advert campaign, in terms of the length. Because it was a very specific thing we needed and that's what adverts do. He said this campaign is between 10-15 thousand.

EA: The RCUK says do something unique and different to communicate to the public – but I don't think they are aware. If I said 15 thousand pounds to make a movie, they would never give it to me. There is a lack of overlap between request – they ask you to do something of that kind but they aren't aware that it would cost much more.

MC: In your case in the future, if you go for a film, you get what you can from the science money, but you should go out and find investors who aren't part of the funding bid. They will give you money because they believe in the project. You can't count on money from the sciences because they can't justify that amount of money.

EA: Are there funding from other sources?

MC: There are many, but it depends on the moment. If we went and checked now, it's one things but in July it could be different. There is also Kickstarter and crowdfunding – a friend of mine got ten grand and she gave back a keyring, because you have to give something small back – it could be a copy of the film for free. You need that extra money, and I said that in the chapter as well – this is to conclude and help you understand my conclusions. I wanted this experience because I really wanted to understand what it means to make a film like this with a person who's a scientist. I really wanted to go through the struggle like we went through to understand how you do this stuff, because my PhD analyses environmental and climate change films but I I don't believe in those academics who go and judge a film but they don't know what it means to make a film. It's easy to judge and easy to say it's shit – the film isn't that good. You don't know how hard it is to make a film. I don't want to be one of those academics who goes around saying this film is good this film is bad when I don't know what it means to actually do it.

EA: It makes perfect sense.

MC: That is the strength of the project. You now understand what it means to go through this, even if it is small.

EA: From my side, what it means to do that in a creative way, who are the key people in the process, it is important to know. But also, what we just said, if we are asked to impact the public, to be given budget, you have to be aware to do something that we did requires a budget beyond availability. You have to go back to the funders and say this is what it costs. And the only way to learn that is to experience it and it is a lesson learned.

MC: Definitely, if we do something together, call an expert on budgeting and the budget has to be real. Because otherwise, it's not possible. We did it because we had help but if you don't have this kind of help – you don't have Paulo or John; you wouldn't be able to make it with that kind of money. What we did, cost more than we paid for.

Appendix C

Interview with Dr John Finnegan (09/02/2019)

By Michela Cortese

MC: What can you remember about the development of this idea starting from the beginning?

JF: I had an idea for a few years about a couple who go to the West of Ireland to track down their ancestors and there was a Banshee character terrorising the location and it turns out the town is the real antagonistic element. I remember sitting in a bar somewhere in Falmouth with you and I pitched you the idea. You then pitched back the idea that the protagonist should be a PhD student from Dublin who comes to the island looking for an artefact. I remember that for an hour we bounced ideas back and forth and by the time I got home that evening, I wrote up a one- or two-page synopsis where it was the same story, but it had incorporated your ideas. Because I love treasure hunting films, it turned into a treasure hunting movie for a while. My memory was that I was primarily the one with the ideas and you were the sounding board giving advice and eventually a lot of the main ideas that came out of the story were your ideas and that's how you came in as an official writer on the project.

After a few weeks of this, it moved very quickly, Oisín Mac Coille, somebody I've worked with a lot in the past, he had emailed me asking for a horror or thriller project. I found this to be strange because here's something we were working on. I gave it to him thinking he would hate it, but he got really excited about and I thought, okay, we have something here.

That's how the project got off the ground, and the more we worked together on the character and the world itself, our interests started to feed into it, and it became a strong environmental thriller and that theme emerged quite naturally through the project. The treasure hunting element took a more intelligent route where it was less about that and the character became from and centre and the treasure elements became part of the backstory of the island. It was a case where our interests found a home in the story, and when we wrote the script, I remember you saying we needed to really single out what this story is really about. What is the identity of the story? This is where the piece came from.

MC: When I told you, there was still treasure to be found, there was environmental issues and a bit of everything. I remember thinking we needed to emphasise the strength of this protagonist and I remember at some point thinking that this film has everything, but we need to give it a

clearer identity. We chose on an environmental thriller. How did you feel when I suggested this?

JF: As I said, it all fed into the script in a natural way. The location was already a place that had its problems, but those problems weren't entirely clear at the time. This was a perfect opportunity to explore environmental storytelling.

MC: The science helped fix those plot points?

JF: Yes, definitely.

MC: How did you write the treatment, the general process you use as a writer?

JF: I have a very specific story map I use when I'm starting off to make sure I have the right ingredients for the story. I bullet pointed the story first, expanded on each of those points. My initial synopsis was just the beginning, middle or end. There was never any of the complex ideas we were exploring in the story – women haunted by history or environmental aspects.

MC: Themes?

JF: Not really. I was just concerned about having enough content to get the story off the ground before thinking about more complicated ideas.

MC: Personally, when you think about an idea for a script, and you think about beginning middle and end, you are personally more concerned about content?

JF: You can't make your environmental message if you don't have a story to work it into. We had an adventure story, a character, antagonist, a location where it can play out. We have a general idea of a character arc, a woman tormented by her past. It was a question of do we have enough to work with to play with those ideas. Otherwise, it'll be a poorly paced and structured story. After that was in place, we had room to expand. We had A, C and E and now we could figure out B, D and F. Each draft was about fleshing out those ideas more and more. You then step back and look at what you've created. You realise that you have a stage with puppets and characters and now we can say, "what can we do with these?". It's like raiding your cupboard and finding a host of ingredients and wondering, what can we cook with these now.

At the time I was just trying to write a cheap B movie, I never had any intention of aspiring to something like this, so I wasn't thinking about the potential of those ideas yet. After a few drafts of the treatment, I knew I had something that could be more than just a b movie. I knew there was an opportunity to tell a timely story about women haunted by history. The fact

that you saw its potential for an environmental thriller shows that we had enough ingredients to make such a movie. That was really the first stage of writing this – making that transition from a B movie to a complex environmental thriller, a social cause piece.

That would never have come about if we hadn't started out with the 2-page synopsis and build up to the 11-15-page treatment and finally, the script. That treatment was a really detailed document – it was very clear what characters were doing and why. The story had found its place then.

MC: So how did you work on the development of the script?

JF: The scriptwriting stage was just about adapting the treatment. That was where much of the work was done. If you have a strong enough treatment, the script should just write itself.

MC: Why is the treatment important?

JF: The treatment is the plan for the script. Many people write treatments after they've written the script because they need to send it to the agent, but the treatment is a very important aspect of the writing process. You can get more drafts of the story out in treatment form than in script form. You can identify the structural issues and so on. It's a road map for you to see all the turns and bends clearly than you would if you were in the driver's seat.

So, I remember the first thing I did – I started writing the script in late October, with an eye towards having a draft for Oisín in late November. Very early on I realised that even though we had a very well written treatment, we wouldn't have enough scenes to make the target page count of 90-100 pages. The first and third act were very well laid out, but the second act was missing about 10-15 minutes. This is something you only realise when you start adapting the treatment into a script because even a treatment won't have every single scene. So, I had to go back and do some restructuring. I remember that at the same time, you came in with the idea of rather than the main protagonist coming to the island to look for treasure, she should be looking for her brother-in law and a lot of the uncertainties of the script became more ironed out.

I realised we didn't have a reason for her to go from location to location. Without that reasoning, there was no reason for the audience to see the island as it were. We knew the places she needed to be and when, but we didn't have a legitimate reason for her to go to these places. So, the missing brother-in-law played a key role in that, because she's following his footsteps

and because of that, we were then able to give more time to the environmental aspects because the environment was more on show now.

All in, it was about three months before we gave it to Oisín but that script was very tight by then, despite being a first draft.

After that, you spoke to an expert, there were aspects that you were uncertain about. Oisín was quite satisfied I know, but there were things that we were bothered by and each month or so we would go back to revisit it. Around July 2018, that's probably when we did our last draft, the one that had the most significant environmental message.

MC: I was developing a script with you and give your ideas. But I wanted to increase the scientific accuracy of it. For me it wasn't enough to just say it was an environmental film without making sure that every element relating to this was scientifically grounded. We had a few points: For me, we needed to go into details about how the island functioned. We are dealing with a place cut off from the real world. I couldn't see how this island functioned in the 21st century. I asked you both and we had a brainstorming session about how they live here and how it works. How did you deal with this?

JF: I understood where you were coming from with those points. I also felt that if went too deep into trying to understand every facet of how it came to be, we would do one of two things: we would rob the imaginative possibilities of how things happened and how it got there. The happy accidents that can come from not having all the answers. You can ruin the mystique of it. The second reason was that if you try to explain it too much, you give the audience too much fuel to debunk the idea.

The example I use is Inception. If Nolan explained the logistics of how things work in this world where people can steal each other's dreams. If you really unpack it, it doesn't make sense and it unravels. But the reason it works is because Nolan considers these aspects to be unimportant.

If we tried to explain this hyper-real place too much and overthink it, we might stop ourselves from allowing other things to happen. We were certainly thinking on the right level and it had its benefits, but it was a concern that I had. I didn't want to deprive ourselves of other things happening because we had pre-agreed that the characters were living by another set of rules. It wasn't a case of being right or wrong, it was just a personal hesitation to go too deep into it.

MC: You had livestock dying on the island. What was your explanation before I said anything?

JF: I chalked it up to a mining company that was operating in the 1800s. The idea was that the pollution caused by that had spilled over into the next century and was now destroying the livestock and making the island uninhabitable. When you say it out loud, it doesn't make sense that pollution would wait a hundred years.

There are examples in movies where these kinds of things can happen in a story, but we wanted to hold ourselves to a higher standard.

MC: You believe this doesn't matter?

JF: If it's not what the film is about, you can do what you want. At the time, the mining company served as a reminder that bad things have happened on this island for centuries. It also allowed the protagonist to find old documents to find where locations were on the island. It was a conceit to give her information. But, when we wanted to start exploring the environmental side of things more, that element became very important and it had to be rationalised and explained in more detail.

MC: I had a conversation with a scientist to get her opinion on what could happen on an island that would cause livestock to die that could also be related to climate change. I remember I was struggling to understand this from the previous drafts.

JF: Again, because the environmental element was there, and it was being teased out, but it wasn't written with that in mind.

MC: When we were writing the script, I felt I wanted to use terminology related to science to just get the message more explicit. What was your take on that?

JF: I was against it. To me, if it's not in the character's voice, it doesn't work. It felt very obvious what was being done. I wanted the characters to be speaking in ways that were more natural to the tone of the story. The film has a certain vocabulary in it, so we had to adhere to that, I felt. However, I did make sure to work these ideas and explicit explanations into the script. It didn't require much work because they did still fit into the story, but they were just being spoken through the character's voices now.

I think my concern stemmed from the fact that I didn't want to sacrifice the integrity of the characters and the scene to get these specific phrases across. I wanted to find other ways.

MC: If you didn't want a specific vocabulary being used in the script, in what way does the science come out in the screenplay. The environmental issue of water pollution being caused by climate change, I mean.

JF: The characters do say what is happening. Some of the stuff just has to be said. What's being said is mirrored by what's happening on the island itself – the characters fighting for survival, debating whether or not to leave and so on. There's a compliment of clear explicit dialogue explaining the environmental threat, and scenarios and situations on the island. There's also the fact that the protagonist is trying to escape the island.

MC: Are there supplies coming to the island?

JF: Yes, I thought it would be a good idea to show crates of bottled water being delivered to the island by the local priest of the region. A nice symbolism of the church bringing supplies to the third world country as it were. It draws images of third world aid. The idea of the islanders being climate refugees is communicated in the very first image of the film – a television on the boat playing a news report of climate refugees elsewhere in the world. The climax of the film has the islanders escaping the island on the boat with the Protagonist.

Even if you removed the expository science, someone educated in environmental studies would clearly see what we are getting up to in this story. The hard science and the clear explanations of the threat, that definitely found its way in through dialogue in small amounts. It doesn't need to come across as a lecture. It can literally just be an occasional complaint by an islander or a reference to something in history. It's very easy to drip feed an idea slowly and carefully. That's what screenwriting is. It's not about handing the answer to the audience, it's about allowing the audience to do the work through clues layered in through the screen work. Getting the audience to think about all these scientific ideas – that motivation is fed to them through careful revealing of information throughout the story.

MC: I brought the climate change refugees idea and inspiration came from a certain documentary. Many people are not climate refugees, so how do they identify with the climate change element?

JF: What islanders go through is something that anybody can experience whether they live in a rural or urban community. Flooding can affect everyone. People living in basement apartments having to abandon their homes for a few hours even, that's similar but on a much smaller scale. You don't have to look to the extreme nationwide devastation in order to find cases where people are affected by climate related flooding. We aren't depicting a continental

devastation like *The Day After Tomorrow*. We are looking at an island slowly eroded by various problems over hundreds of years. Every rural community is affected by this.

MC: Do you use strategies?

JF: The strategy was not using the big case studies. Not affecting a city or a country. Keeping it rural and localised in a small island that could quickly become forgotten about.

MC: You think people identify with the story because of that?

JF: No, I don't think they identify with the story, because that's the protagonist's story. They identify with the climate change threat and its effect on the community because they can see examples of this everywhere in their own communities. We created a threat that isn't unusual either. The idea of livestock drowning in fields is extreme but not unheard of.

MC: Kip Thorne and Nolan created a problem that was imagined in a hundred years. We didn't do that.

JF: We could easily have stripped this down and set it in the west of Ireland in a small town that was just ravaged by winter flooding. It would have been totally believable and scientifically sound, and audiences would have just said, I hope that doesn't happen to my community. They would have empathised, no problem. If you do that however, you rob yourself of the unexpected things that could happen, and you rob yourself of the opportunity to do more with it. We set it in a fictional island, one that is more extreme than simple flooding – a little more complicated. It looks like the problem that I've read in newspapers but it's not that. There's that escapist quality to the story, that horror flare. Not just a bad guy in a community, it's a man with a mask. In this story, it's not just a flooding issue, it's a particular type of flooding problem.

What we created here was something that audiences could embrace – it's not a story about a true story or a hard-hitting drama that's close to home. You want to create something that's escapist but that slowly looks like something you know. It's like *Halloween*. It's a man in a mask, he doesn't look like or behave like anyone you know or think you'll encounter so it's okay – you can go to the cinema, let your guard down and enjoy the story. But slowly you realise that neighbourhood in the film looks like your neighbourhood. The people being killed, look like your family and friends. That man in the mask could be anyone now. Walking home from the cinema alone doesn't sound so easy now, does it?

It's why a lot of film that attempt environmental issues go big and loud. If it was just about a small community, it wouldn't find its audience – but *The Day After Tomorrow* goes the opposite extreme, it goes too big. They created something that we can scientifically say isn't going to happen for a thousand years.

What was smart about *Interstellar* is that, even though they created a world that's somewhat far-fetched or look like our world, they remind you that this has happened in our history, the Irish famine and the dust storms in America. They remind you that this isn't that far-fetched and there is a scientific grounding in it. You don't need to be a scientist, nor should you have to be, in order to be convinced that this is a believable threat. All you have to do is remind them that it happened already. That's the same kind of strategy that we used, I think. We created a small localised problem that has happened before but at the same time it's hyper real, so you are prepared to buy into it and let your guard down and go into this other world like someone is trying to preach at you. Localised but going into the world of fantasy as well.

MC: The media tend to report about globalised issues more than localised because it gets more attention from the public. A project like *Interstellar*, Nolan was saying that they needed to keep it general not too specific for audience engagement.

JF: The problem with *Day After Tomorrow* is that the science isn't sound. It's not. It can't happen overnight without us knowing. And even if it did happen, because it's a Hollywood movie and happens on a total global level – they pitch it as a happy ending, the president gives a hopeful message, the father and son are back together – but it's not. It should be sadder than *Schindler's List* or *Titanic*, because of the sheer number of people who die in the film. But it's not because it's not remotely plausible. You can pin point a single place in the world where a community, even a small one froze to death instantly.

The Handmaid's Tale is a great example, if slightly unrelated. Margaret Atwood stressed that everything in that world she created is happening somewhere in the world right now (at the time of its initial publication at least). It makes her world real. You buy into it as a scary premise.

MC: By having a more contained and localised world, it's better –

JF: It's believable because we're not asking you to accept that half the world was destroyed, we're asking you to accept that only a few farms were destroyed and that's a far more digestible idea for the audience. We didn't go big. You can pin point somewhere in the world where this is happening right now.

MC: You were briefly mentioning the disaster film before. From a screenwriting point of view, you define this film as a horror.

JF: That's probably the lazy definition. It's an investigative thriller more than anything else. I'm being lazy when I say it's a horror – it's more than that. It could be an environmental thriller. It's a thriller.

MC: Each film that touches on climate change is a different genre, based on my research. How is the thriller a suitable genre to talk about the environment?

JF: The environment is an important aspect of any film and if you can make it dangerous.

MC: Climate change specifically.

JF: The reason we are afraid of climate change or talk in a negative light about it is because we're afraid that the environment can hurt us. We wouldn't care if it couldn't hurt us. There is a fear of death that underpins climate change. The reason climate refugees flee their home is because they fear death.

Fear of death is the key component of any thriller. Whether you are looking for a killer or being pursued by a killer. It's always about dealing with death. The point of going to see these films isn't about will they survive or fend off death – we know they will. It's about how. And that's the big question of climate change. It isn't will we solve it or will it hurt us, it's how will we solve it, how can it hurt us?

For me the idea of climate change stories being told in the form of a thriller – it's a natural fit.

We are telling a story about ghosts on an island, but climate change is the real ghost that is haunting them. If we just had a ghost story on its own, it would be a thriller. The fact that the ghost of our story is the climate, it makes sense for it to be a thriller. We emphasise the thriller element of the story by having actual people pursuing the protagonist, the fear of death is evident in every corner.

One thing I will say is that climate change films usually go far too big and just blatantly show us the disaster as it unfolds. *The Day After Tomorrow*, *San Andreas*, *The Impossible*. I'm not sure if they are all climate change films, but they still just document the disaster. There are more interesting ways to discuss this subject or to talk about it indirectly. *Take Shelter* is a great example of this. What we're doing is highlighting very real threats that affect any island community anywhere in the world – they don't get the same response from local governments

or emergency response units, because they are disconnected from the mainland. They are on the backfoot and so we are telling a story that's real but that isn't directly documenting climate change. This isn't a movie about environmental catastrophe. It's a movie about woman trying to find her brother in law in a community threatened about climate change – because we're not telling the story of a community affected by climate change – because it's not the point of the film – the message can be received in more effective ways.

Wind River isn't about the atrocity of forgotten missing women – but because it has subtly slipped that message into the film, it hits home with us – the audience discovers this, and it peaks their curiosity. That's what we are trying to do with *The Dead Cry Out*.

MC: We wrote the script, but we didn't make the film. We wrote a pitch bible as well. How does the pitch bible play a role in the production?

JF: We put the pitch bible together to have everything you need to know about this film. It has the 50-word pitch, the one-page synopsis, the treatment and writer's statement with our vision for the story. Mood boards and cast lists. These are very useful for us starting off because it was the foundation for the script to be written on. It was the thing that we were using to write the script. It had all of our ideas and the vision that we wanted to explore. As we wrote the script, we continually went back and updated the bible to reflect the direction that the script was going in. Now that we've finished the script, that pitch bible is very important because A, the script is very unfriendly. There is an irony about screenwriting because it is a literary text, but it is completely unfriendly for people to read and engage with because we're not used to reading scripts. It can throw people. We are sending it to people who obviously familiar with screenplays, but it doesn't change the fact that the script is a long document, 90-100 pages. You read 20 pages here, 20 pages there. Suddenly the subtle messages can get forgotten about.

One of the reasons we introduce characters in upper case in a script is to remind people that we haven't seen this character before. We don't have the visual clues of the screen because we only have the written words. These messages are at risk of getting lost in the script, but they are preserved in the pitch bible.

When people say send me the script, I say no, read the bible first. Understand what we're trying to do and then read the script. We're not writing something complicated – it's very conventional and not very ground breaking. It's a story you've probably seen before in a different setting but nevertheless, we don't want you to read the script and not get all those ideas that rely on visual and audible cues as well. They're in the script, but the script may not be the best way to communicate the idea at that stage.

Television is a good place where pitch bibles exist. They don't have the scripts because they don't have the budgets or the format down, so they don't just start off writing the scripts. They also have other people they need to collaborate with in a writer's room, so pitch bibles or development bibles are very important in these instances. I lean very heavily on these.

Writers don't always use these – I think they should because screenwriters are communicators. Everything screenwriters do is pitch. The premise is a pitch for a treatment, the treatment is a pitch for a script. There script is a pitch for a movie. It's all essential for what we are trying to do which is communicate the screen idea – in this case, environmental change.

Appendix D

Interview with Oisín Mac Coille (10/02/2019)

by Michela Cortese

MC: How did you see your role in this collaboration?

OM: Initially when I first started it was a soundboard, John would come onto me as a director, how would this work, how would that work, what would be your idea doing this way. It came out of me and John wanting to do a feature together. We had done the shorts together, the bits and pieces together and we felt it was time to try our hand at doing a feature and seeing what we could do. Originally it was supposed to be a low budget film, do it any way we can during the summer – but when we started to see what the ideas were, we were so similar in where we were going with the concepts that it grew legs and it grew outside of that possibility. It suddenly became a proper feature film. That's when I stood back and thought as a director and you took a greater role beside John to fine tune the story and make it more polished. You angled it towards the story we have now.

My role as a collaborator stepped back to being an antagonist – I'd find holes in the story and I was no longer on your side of you and John, I was coming to it from a director's point of view and sometimes I probably wore the wrong hat – coming to it as a producer and thinking, how would we do this. Could we simplify this to make it cheaper. What I should have done was think, let's get the story as tight as we can no matter what the budget and when we get the right producer, they can worry about that. At the moment, my role in this collaboration is that of director. I'm thinking visually and –

MC: You are thinking about how you are going to construct the image, how it will be filmed.

OM: Even more minute than that. Not even composition. I'm thinking what elements are going to be in that frame, visually instead of two talking heads. How can we show she was a twin by having dual images on screen and one of those images slightly obscure or unbalanced to show that her sister has died?

MC: Because you mentioned, this particular shot, could you tell me all those environmental aspects that we have? We have specific moments when the science is mentioned (there was flooding or pollutants, etc.) or the idea of the community affected by a disaster. How do you

see them as a director? What do you think are the challenges of communicating that? How do you view them?

OM: It's one of the elements of control that our main antagonist has on this island is that he supplies the fresh water. We are setting up from the offset that natural resources are being manipulated and abused for someone's gain. The challenges as a director to show these as an important character as much as the others, the environmental issues that are happening in the world, aren't blink and you miss it. They have to be as strong as our protagonist in terms of character. Without these nods to the climate change issue on the island, it just becomes an action adventure movie. There is no message about climate change or the use or abuses of natural resources down through the centuries. Trying to show that visually without it being a minimal subplot is quite tricky. It's something I've never done before and it's a challenge I'm looking forward to doing, but it's the hardest part to get across because, outside of that, it's just another summer blockbuster movie. Be it the natural resources or the human level of how we treat each other.

MC: It's good that you think so highly of these elements.

OM: We show bottled water arriving on the island at the beginning. How do I get the audience to take notice of it and care about this without losing the background action of Amanda and Mick? How do we place the bottled water in each scene and manipulate the audience to see the plastic water on an island and get them to think about that without using words – how do we tell the audience that these are important, not so much to our story but to the whole world that the island is on.

MC: I guess, you are telling me that you are thinking about these different issues. Could we say that other directors would find it if they had to include and deal with more scientific issues.

OM: I don't think that there's any comparable movie to what we are trying to do. If you think of other environmental films, Erin Brockovich, Promised Land and Rainmaker. These are set around environmental issues. Our film is an adventure film with environmental issues in the background. Other directors are typically working with just telling the environmental story but for us, it's the b or c story of our film. It's trying to marry the scientific evidence with the action adventure mystery which is a difficulty that other directors wouldn't have to do. For them, there are a lot of talking heads, but ours is set pieces and adventure. Lots of movement.

MC: Because of what you just said, in this story that we have right now. We need money to make this film, so we need to sell this script. How important is the climate change aspect in order to get money...?

OM: To sell it, I don't think if we are looking for a producer or investor, the environmental issue will have a huge bearing on it. This is a shame because it's a strong subplot, but to sell it to a producer, they'll be looking to the adventure element – unless it's a disaster movie like day after tomorrow, which it isn't, they won't be looking for the scientific issue.

MC: We mentioned pollution, climate refugees, but for you it's the 'A' story...

OM: The 'A' story is Amanda's experience on the island – the investigation. The producers that I think we have an opportunity to attach themselves to, I think they'll look at it as a vehicle, not a message piece. In an ideal world, I'd find a producer who understands why we are using the environmental and climate change element as allegory to what is happening on the island or just for the whole climate or biosphere.

MC: Not sure if this is a complicated question – have you been thinking about how to translate the script – have you any techniques. If we had a small or high budget, how would it affect your approach.

OM: I don't think budget affects the telling of the story. It'll affect the tools we have to do so. Whether we have a 20-foot jimmy jib or a high angle shot. Once the visual grammar is there, the rest is production value. If we have no budget, the shots become hand held to achieve the same effect. If we have 20-25 million, then let's go mad. Let's have cranes everywhere and multiple cameras to get different angles of different shots.

I tend to not think too much about my shooting style until I know about the budget. I would love to shoot everything practically – use real fire on the island, for example. But we might not be able to do that. We might have to be sat in an office for 2-3 months afterwards on After Effects trying to paint in the fire. Which we may not be able to do either. The producer might say this has to come out of the budget because we can't afford it.

Do we do a force perspective shot? There are ways around it, but I don't want to tie myself into a technique until we know the budget. Style wise, it would be hand held to put ourselves into the action adventure of the film. For more composed moments, I'd use static shots. I'd like us to follow Amanda on her journey, not see it from our own perspective.

MC: This is a question that I asked John and I want to ask you. We had a meeting about trying to understand the world. I wanted to make things clearer. Is it possible that pollution from 2 hundred years ago could affect the island now? I had a chat about an expert about it. How does this world work? It's far removed from contemporary way of life. John said that the more we go into this, the more we make it complicated. Do you agree with his perspective?

OM: It's a discussion I've had with someone recently. If we get too bogged down in a factual viewpoint, we lose drama and entertainment elements. When people are going to see DCO in the cinema, they want to be entertained. The project in question was so heavily researched but it wasn't drama or an entertainment piece. If we are getting too exact on elements in the story, we may lose some of our audience. Some I'm sure probably don't believe Climate change doesn't exist. If we start adding too much information regarding these subjects, they may see it as a subliminal message to coax them into thinking this way. It's not that your concerns aren't valid, it's about trying to create a 90-minute entertainment piece and the audience needs to be able to draw conclusions themselves and go with it. It sounds like a cop out but if they start questioning the story – oh this happened then this wouldn't happen – they start to lose the hyperreality side of the film.

MC: I wanted to ask you about the pitch trailer and how you made it. How was it conceived and how did you make it?

OM: The pitch trailer grew out of John and I wanting to make it come Hell or High Water. We wanted to prove to producers that we could write something dramatically engaging and that I could adapt it to the screen while maintaining the tone that John had set. We decided that if we were to shoot the trailer from scenes from the movie, why not shoot the film. We decided to write a standalone scene, not to tie the trailer into the movie, but to give an idea of the tone and the texture and the theme of the movie, without giving anything away from the movie. We came up with an idea – there is a scene where they come back from the island and the emergency services are taking the refugees into the mainland. We thought of what if Amanda was questioned by Irish police in a police station afterwards. We used the interrogation as a way to get information across to the audience, so one of the questions that the policeman asks her is, “when you finish your thesis, we'll call you Dr Devlin?”, so now the viewer knows that she's an academic doing a PhD. We were able to mention other characters names and so on without having to cast them.

When John and I were happy with the trailer, we set about to shoot it. It's coming up to about 12 months – it was shot on 27th February 2018 and it was done by me. I approached it as

if I was shooting the film. I surrounded myself with a professional crew, 12 or 13 of us. Camera assistant, 2 lighting guys, 2 sound guys, art director, make up. It was a full production. We tried to show what we could achieve. What we achieved with no money is cinematic and filmic. I think it's very good. It was a good reflection of the themes of the piece without giving away the overall story of it. In terms of actually shooting it, it was a morning. We had 8 in the morning until 2 in the afternoon to get it shot. We used a studio in Galway, two local actors and we just had 6 hours to shoot. Again, it makes how it looks that bit more impressive. For those who will eventually see the trailer, the investigator has a lot more dialogue than what was in the trailer. We cut that because I wanted to home in on Amanda. We never see the investigator, side of his face. He's not important. What's important is Amanda's reaction to what she's been through. We never cut away from Amanda because it shows what she's been through. I think the actor in question gave a fantastic performance. I didn't tell them about the backstory of the piece. It was approached as a standalone short film. I didn't want to give an actor who won't be playing the character when we are shooting it, I didn't want to give her too much information, so she wasn't muddying the trailer – so she wasn't thinking of it too much. Even including the DP, the script supervisor or the production supervisor knew nothing more about the piece because of what was needed. It was quite fun to do. It was a real room in a studio, no sliding walls, no floating space. 4 walls and a door. Trying to make it look like a questioning room in a station – it looked good. We had good fun trying to make the world look claustrophobic by concentrating on what was around her.

MC: Was the environmental aspect a factor in the creation of the trailer?

OM: No. It wasn't discussed in anyway shape or form. I think at the time, it wasn't that prevalent, it was still an action adventure film. I think we were on draft 1 or 2 of the script – it wasn't as prominent in the script.

MC: John said the same, but from my perspective, there was a discussion about the environment playing a role in the film. It wasn't important...

OM: There was one line between Amanda and Danny as they are walking towards the fort that the mining company brought up a certain chemical. It was a line that could easily have been cut. At that time, it didn't have any bearing on the story. There was no real tie in to the human risk. At this point, that was the only one line that was referencing the environment in a real way and it's one of those lines that, if you didn't understand, you could easily lose that line.

MC: Not that you are reminded that it wasn't that strong, now that it is, do you think you would have done it differently?

OM: Visually, I wouldn't have done it differently. Tonally and thematically we could have done it differently. We could have tied in the plastic bottles of water or a joke about the water. It would have been a visual reference or a line of dialogue. I don't think that what I'm watching now, if the environmental stuff was a factor at that point, I don't think it would have made a big change.

MC: Since the science wasn't there at the beginning, when we did include it more and more, did this change your view of this film?

OM: It bought in a new meaning for me. It made the film more grounded in reality. It's an allegory, a microsphere of what the whole world is suffering from – water issues, crops, livestock issues. It became less fictional and more real – there are real people struggling with these issues. It wasn't just a throwaway moment in the movie. These things were tangible. You could see it happening.

Appendix E:

***The Dead Cry Out* Screenplay**

THE DEAD CRY OUT

by

John Finnegan & Michela Cortese

Draft 4

22/04/2019

John.finnegan247@gmail.com
Michela.Cortese@falmouth.ac.uk

1

INT. THE NICOLISA - NIGHT

1

An old passenger ferry that has seen better days. The lights flicker as the cabin rocks from side to side on the Irish sea. Rain and waves pound the glass on the other side.

A television mounted in the corner shows an Irish news broadcast - flickering images of A REFUGEE CRISIS elsewhere in the world. The signal fades and the image is lost.

A young woman, AMANDA DEVLIN (30s), stares at her reflection in the window as it vanishes and reappears in the flickering moonlight. Like TWINS passing in dead space.

Amanda notices a passenger, who we will come to know as DANNY (mid-late 30s), asleep and with EARPHONES in his ears.

2

INT. LECTURE HALL - NIGHT - FLASHBACK

2

Only A FEW STUDENTS fill the old lecture hall. It is a room that looks like it has stood for a hundred years. Big doors with clanking locks. The kind of room that's impossible to escape from unnoticed.

Amanda, dressed in smart casual attire, is standing before them as she delivers a lecture.

The large screen behind her is filled with violent illustrations of the Cromwellian invasion of Ireland.

She sees a student listening to something on his laptop with EARPHONES.

AMANDA

Sir Francis Drake, fresh from the Rathlin Island massacre, where 600 men, women and children were slaughtered, now sets his sights on Grace O' Malley on the west coast.

Another slide features a depiction of the massacre --

AMANDA

He shed blood on Tory Island.

The next slide appears.

(CONTINUED)

AMANDA

Here he is again on Achille, and again on Inishboffin. Each island, a haven for piracy and stolen artefacts. Working his way around the coast until he came to --

A LOUD MECHANICAL CLANKING SOUND indicates a middle aged Irish professor, JOHN MCCABE, entering through the large door and slipping into a seat at the back of the hall.

The screen features a depiction of an island --

AMANDA

The island of Hy Brasil. The mythical vanishing island, far into the Atlantic. A myth encouraged by Grace O' Malley to hide herself from Drake.

McCabe is also fascinated.

She brings up a controversial photograph. Violent and disturbing. People squirm in their seats at the sight of it.

AMANDA

We know it as Blackcross, where in 1575, Drake murdered twenty four innocent women to find O' Malley.

The illustration depicts WOMEN DROWNING AT THE HANDS OF DRAKE on the shore of the island.

AMANDA

He never did find her. The women died that day to protect their queen - buried at the site of O' Malley's treasure.

She almost takes pleasure in their discomfort as she scans the room. She takes a heavy book --

Amanda notices McCabe and some of the students turn to see him.

Amanda drops the book in front of the student. It makes a deafening sound and the student jumps.

AMANDA

If you believe the stories.

(CONTINUED)

THE STUDENT embarrassingly closes his laptop, which indeed has a film playing.

AMANDA

(to everyone)

The records are vague about this you see. And that's the whole point. History chose to forget these people.

The group return their attention to the slides.

AMANDA

"Be it real and firm land, kept hidden by God, as the earthly paradise, or else some illusion by airy clouds appearing on the surface of the sea, or the craft of evil spirits."

Amanda shakes off the reverie of the tale.

AMANDA

Roderick O' Flaherty.

Students shuffle out of the lecture hall.

Amanda checks her phone as though expecting someone.

MCCABE

Find the women, find the treasure.
Is that right?

Amanda turns from the phone to see the professor approach.

AMANDA

How about just 'find the women'.
Isn't that enough?

MCCABE

They love the pirate stories.

AMANDA

Nick is a better storyteller than I am. Nick Mason, he's the course leader.

MCCABE

I know who he is. I appointed him to the job. The job you're doing it seems.

AMANDA

It's McCabe, isn't it? Nick is on leave.

MCCABE

Is that what he told you?

AMANDA

Is there something else I can help you with? I'm running late --

Amanda finishes her packing.

MCCABE

No, you've been more than helpful.

Amanda smiles and takes her things to leave --

MCCABE

Why Blackcross?

Amanda stops --

MCCABE

Why not Rathlin Island? Why not somewhere more --

AMANDA

Glamorous?

McCabe smirks, realising he has struck a nerve.

She leaves. McCabe is left with quiet admiration on his face.

Amanda's office is cluttered with books on history and photographs of mountains and far off lands. The belongings of someone who has travelled the world and seen a lifetime of adventure.

A picture of Amanda standing with a young man of similar age, that we will come to know as NICK.

A forgotten set of ROSARY BEADS buried underneath papers.

MCCABE

You work late. Like your brother.

McCabe lets himself in.

AMANDA

He's not my brother.

McCabe looks around and sees the maps and the diagrams.
He's fascinated by the pictures.

MCCABE

Is that --

AMANDA

The Urals. Nick was caught in a
rockslide two days after that was
taken. Carried himself back to
civilisation with a cracked skull.

AMANDA

If this is about Nick wandering
off, I wouldn't worry. Nick has a
way of finding his way home.

MCCABE

I worry because I know where he
went. You know where he went too.

A map on the wall shows the island of Hy Brasil.
Blackcross.

McCabe is looking at the family picture of Nick and
Amanda. Amanda is packing her bag.

MCCABE

I blame myself for letting him go
in the first place, but I thought
the time away might do him some
good after -- well --

Amanda understands.

MCCABE

I can't imagine what losing a
loved one must feel like. But
Nick, he didn't recover from it,
did he?

AMANDA

You never recover.

MCCABE

I know this isn't the conversation
you imagined having this late.

AMANDA

Ellen was my sister. She was his
wife. We were family for a while
and then it was like we weren't
all of a sudden. He disappeared
into his research.

She puts a large bound document into her bag on the table
- Amanda's PhD Thesis.

MCCABE

Tell me about *your* research?

AMANDA

(ref the
illustrations on the
wall)
Post civil war propaganda in
England.

MCCABE

I remember now. Nick told me great
things. The campaign of
misinformation to unify the
country against a common enemy.

AMANDA

Where I come from, we call it
'fake news'.

McCabe takes her thesis - Amanda is clearly put out.

MCCABE

Have you had a date for your
defense?

She shakes her head --

MCCABE

I'll take care of it.

AMANDA

I'll be fine. I have a good
supervisor.

Amanda takes the thesis back.

(CONTINUED)

MCCABE

Who lets you cover his classes.

AMANDA

Whatever you're looking for, I
can't help you.

Amanda takes her bag and coat - ready to leave.

MCCABE

The hardest question I got asked
in my defense was "why"? Why I did
the research. A lot of people just
can't answer that one.

She stops again.

AMANDA

You know where he is, I suggest
you make some calls.

MCCABE

I'll do that.

He stands up --

MCCABE

Cromwellian propaganda and
Blackcross. That's some
combination.

AMANDA

Nobody else wanted to talk about
it.

He leaves.

She sees the picture of Nick and what looks like Amanda -
taken during better times. The life of an adventurer.

Amanda is leaving the University when McCabe sees her
outside.

MCCABE

I think you've lost your edge.

She is surprised to find McCabe nearby. Surprised and
insulted.

AMANDA

Excuse me?

MCCABE

You're not the same woman from
those pictures.

Amanda doesn't know how to respond.

MCCABE

Maybe one day you'll tell me the
real reasons.

He turns to leave --

AMANDA

Because twenty four women died for
something.

McCabe is stopped.

AMANDA

And we chose to forget them.

McCabe tries to understand --

AMANDA

That's why I do this.

McCabe nods. Amanda looks as though she's bared her soul.

INT. THE NICOLISA - NIGHT - THE PRESENT

The lightbulb swings from left to right in the cabin. The
SOUND of the RAIN is more rhythmic than before.

Amanda is standing next to a PRIEST (40s-50s). The Priest
pours himself a mug of tea from a flask. He offers a cup
to Amanda who rejects it.

PRIEST

You're from the mid west?

AMANDA

How'd you know that?

PRIEST

You don't look like someone who's
seen the ocean too many times.

(she understands)

I did a tour of America about ten
years ago. I recognise the accent.

(CONTINUED)

AMANDA

You don't look too confident
yourself.

PRIEST

It doesn't matter how long you've
been on the water, you can never
be sure you'll come home alive.
The sea always wins.

THE ISLAND OF BLACKCROSS is revealed in the distance. THE
ISLAND IS ILLUMINATED BY ORANGE MIST - FIRES.

AMANDA

What is that?

PRIEST

It's started again. The culling.

She takes out her SMARTPHONE and starts photographing the
awesome sight.

The Priest pulls the zip of his coat all the way to
conceal his collar.

Amanda is puzzled --

VOICE

(via radio)

Nicolisa, are you reading me?

PRIEST

Better get your things. We'll be
arriving shortly.

(to the radio)

This is *The Nicolisa*, Brendan do
you have me?

Amanda goes to the rear where Danny is now slowly
gathering his belongings while waking from his sleep.

Amanda starts preparing for the elements while Danny is
searching his bag. She spies ENGINEERING EQUIPMENT.

AMANDA

So you're here for the water
crisis?

Danny is surprised by the question.

DANNY

Yeah.

(CONTINUED)

AMANDA

Anything I should know before I
get off the boat?

(a poor attempt at
humour)

Avoid the tap water?

Danny maintains his seriousness --

DANNY

Avoid everything.

Danny aggressively zips up the bag again to punctuate his point.

Amanda is surprised and irritated by his cold demeanour.

She too stands up and prepares herself.

INT. AMANDA'S APARTMENT - NIGHT - FLASHBACK

A small apartment in the heart of Dublin city centre.

Amanda is zipping up her rucksack.

MCCABE (O.S.)

(on voicemail)

You'll be staying in the local
tavern. An engineer by the name of
Corrigan will meet you at the
harbour when you arrive.

She eyes a picture of Nick and what appears to be Amanda during better times.

Gathers her belongings and readies for the adventure --

EXT. BLACKCROSS HARBOUR - NIGHT - THE PRESENT

The wind on the island is vicious and dangerous. The storm is raging. Danny disappears into the darkness. Amanda waits in the rain.

She sees the Priest unpack the supplies for one of the men at the harbour. CRATES OF BOTTLED WATER.

At the shore, Amanda is taken aback by the sight of distressed islanders, including women and children, standing in the rain with their possessions on their backs, hoping for passage to the mainland.

(CONTINUED)

She snaps back to reality by the BARKING of a VICIOUS DOG.

Then a grizzly and weathered man, GERARD O' KEEFE (60s), soaked to the skin, tries to control the mad dog.

Amanda is clearly on edge but Danny kneels down and silences the dog by petting it. He looks to Amanda who is slightly embarrassed.

DANNY

After you.

Gerard opens the door of the rustic tavern and Amanda follows.

GERARD O' KEEFE

Your coat. And your bags --

Amanda follows his orders and he leaves the room.

GERARD O' KEEFE (O.S.)

Deirdre, they're here.

Amanda finds a PICTURE on the wall. A black and white picture of FIVE CHILDREN, born into hardship by their appearance, but posing stoically.

Suddenly she sees the reflection of a woman behind her and she jumps. The woman is CLAIRE O' KEEFE (30's) and the daughter of Gerard. She suffers from a limp.

CLAIRE O' KEEFE

Which one of these children is not like the others?

Amanda is taken aback by the statement and studies the image again. Claire leaves with a smirk. Amanda is puzzled.

Turns to Danny who is waiting by the bar.

AMANDA

Are they all like this?

DANNY

She doesn't bite.

Amanda recomposes herself --

AMANDA

So do you have a name? I guess
since we're staying here --

DANNY

Tell me something - do you watch
the news?

AMANDA

Yes.

DANNY

Then you already know about this
place. Neither of us are going to
be staying here long enough to
warrant getting to know each
other.

Now she is truly surprised by his blunt persona.

DEIRDRE O' KEEFE (O.S.)

Ignore Claire.

A woman in her 60s, DEIRDRE O' KEEFE, emerges from behind
the bar and puts a register book before them. Deirdre
dresses conservatively and has a wifely quality to her
mannerism.

DEIRDRE O' KEEFE

She hates that picture. Says it
makes her look stupid. I keep
telling her God made her stupid.
No use in blaming the camera.

Amanda has joined them at the bar and Deirdre puts a pen
before her.

DEIRDRE O' KEEFE

Your name dear.

AMANDA

(to Danny)

After you.

Danny takes the pen, scribbles his name and then drops
the pen again. Grabs his bag and leaves the room.

Amanda goes to sign the register and sees the name -
'Danny Corrigan' - Her wet hair smudges the ink and
makes it illegible.

(CONTINUED)

AMANDA
(to herself)
Danny Corrigan.

She notices Nick's signature earlier on the register.

Deirdre begins the nightly ritual of locking up the tavern.

DEIRDRE O' KEEFE
I'm sure you'll be looking to eat something.

Escorts Amanda --

DEIRDRE O' KEEFE
I left some sandwiches for you in the lounge. It's a pity about the storm, otherwise you could take in some of the sights.

Gerard O' Keefe is playing SOFT IRISH MUSIC from a fiddle by a fire.

Claire is cleaning the tables in the lounge. She drops what she is doing at the sight of Amanda and leads her to a table.

Amanda sits down as a platter of sandwiches and a pot of tea is put before her.

Claire pours the tea --

CLAIRE O' KEEFE
It's nice to have an outsider.

Stops pouring and looks to two young men sitting at the bar. PAUL AND DARRAGH (30s).

CLAIRE O' KEEFE
(whispering)
It is easy to feel outnumbered here.

PAUL
(growing agitated)
Claire --

Amanda smiles politely. She notices Clare's arms have faint bruises.

CLAIRE O' KEEFE

Have you come to find Nick?

AMANDA

You know Nick?

Claire stops what she is doing.

CLAIRE O' KEEFE

He's a nice man.

She reveals AN ANTIQUE JACKET BUTTON from her pocket.

PAUL

Claire. We're starving over here.

CLAIRE O' KEEFE

I was so upset when they said he
had vanished.

AMANDA

How do you know he's vanished?

CLAIRE O' KEEFE

Well it was obvious - he never
came back from the fort.

AMANDA

Has anyone gone out looking for
him since?

CLAIRE O' KEEFE

Not with the storm. He left some
things in his room before he left.

PAUL

(slams his hand on
the bar)

Christ almighty - Claire!

Gerard stops playing.

CLAIRE O' KEEFE

Alright!

Darragh smirks childishly.

CLAIRE O' KEEFE

(to Amanda)

Upstairs --

12 INT. THE TAVERN, UPSTAIRS - LATER 12

Claire carefully and quietly unlocks one of the bedrooms.
She puts her finger to her mouth motioning for Amanda to be silent.

13 INT. THE TAVERN, NICK'S BEDROOM - CONTINUOUS 13

Amanda browses the small bedroom.

A PICTURE on the wall features an abstract image of three women. It is a grotesque image. The title of the image reads: *Banshee*.

Amanda finds NICK'S WALLET on the table. She opens it and FINDS A PICTURE OF NICK WITH AMANDA.

GERARD O' KEEFE
You'll have to forgive my boys.

Amanda is startled by Gerard at the doorway.

GERARD O' KEEFE
Manners were Deirdre's department.
(studies the room)
We never got to properly know
Nick. He stayed one night and then
took his gear to the old fort on
the far side of the island.

Claire sneaks back into the frame behind Gerard with a nervous look on her face. As though she has a separate agenda to her father.

CLAIRE O' KEEFE
Your room is ready.

GERARD O' KEEFE
The storm is threatening the power
so we're going to shut down soon.

Amanda plays along.

14 INT. AMANDA'S BEDROOM, TAVERN - LATER 14

Amanda is sitting on the edge of the single bed in the quaint room.

A PLACARD on the bedside locker reads 'don't drink the tap water'.

(CONTINUED)

14 CONTINUED: 16. 14

She is trying to call McCabe but cannot get a signal.

Tired, she pulls back the bed sheets and is surprised to find a SPIDER IN THE BED, scuttling away. It catches Amanda off guard, but she isn't frightened.

She rids the bed of the insect.

A gust of wind outside rattles the windows and shakes her.

The lights suddenly go dark. Amanda uses her phone to bring some light to the room.

15 LATER 15

The phone has slipped from her hand to the floor. Amanda is deep in sleep.

Then the SOUND OF CRYING AND SQUEALING OUTSIDE. Followed by BARKING.

Amanda stirs and wakes.

At the window, she sees PIGS AND PIGLETS scampering around the nearby enclosure. It is a frightening sound.

Then her attention shifts to the sight of a low sized figure, BRANNA (15-19) hurrying into the dark.

Branna catches Amanda's gaze in the window. She is grotesque in appearance.

The barking dog wakes the O' Keefe's downstairs.

Amanda realises she has been spotted eavesdropping. The figure flees.

16 INT. TAVERN LOUNGE - THE NEXT DAY 16

Amanda enters the lounge to find Danny reading the paper.

She picks up the phone and dials the number in her hand.

AMANDA
Hello, I'm looking for Professor McCabe please. It's Amanda Devlin.

Checks that Danny isn't eavesdropping --

(CONTINUED)

AMANDA

Could you tell him I called. Tell him I'm on Blackcross and I'll be waiting for his call. Thanks.

INT. THE TAVERN - MOMENTS LATER

Amanda checks that her coat is dry and prepares her rucksack.

Deirdre is running the reception desk when Amanda finds her.

AMANDA

Your husband said that Nick had made camp at the fort. I'd like to go see.

DEIRDRE O' KEEFE

I'm afraid that's not going to be possible. The storm has caused damage across the island. The fort just isn't safe for visitors right now.

AMANDA

Surely that's more the reason to check if he's okay?

DANNY

You don't understand.

Amanda turns to see Danny --

DANNY

The roads are flooded. They won't be clear until the afternoon.

Gerard appears --

GERARD O' KEEFE

Stay away from the fort.

DEIRDRE O' KEEFE

The records hall at the school is open. He used to spend a lot of time in there as I recall.

18 EXT. THE TAVERN - MORNING 18

Amanda emerges from the tavern to see people calmly going about their business. The islanders are like people trapped in a different time period. There is an avoidance of 21st century luxuries.

Amanda notices a man, tall and brooding, who we will come to know as MAURICE O' KEEFE (50s), watching her from afar.

He turns and resumes his work.

19 EXT. COASTAL PATH - LATER 19

Amanda is traversing the coastal path when she stops to get her bearings.

Then a horrible SILENCE descends on the area. She looks around, troubled by the unsettling nature of this place.

She looks for the school on her map before deciding to go north instead.

20 LATER 20

Amanda is stopped, look around for a sense of direction. There are no other people around and she is lost.

Then she sees THREE MYSTERIOUS WOMEN in a NEARBY COVE - dressed in OLD FASHIONED CLOTHING.

AMANDA

Hello?

She traverses down the rocks to the --

21 EXT. COVE - MOMENTS LATER 21

The women scatter upon seeing Amanda.

AMANDA

No wait, I'm looking for --

But it is no use. They are gone.

Amanda looks for them but can find no sign - vanished into thin air, it would seem.

(CONTINUED)

21 CONTINUED:

21

She notices a very small piece of land, a glorified rock jutting out of the water, not far away. It is reachable when the tide is out but not at the moment. There is a visible CAVE ENTRANCE on the rock.

The cave peaks her interest --

DANNY (O.S.)

The school is west.

Amanda is surprised to find Danny approaching with his equipment in hand.

DANNY

If I take you to the fort first,
will that be enough?

22 EXT. COASTAL PATH - LATER

22

Amanda and Danny walk.

AMANDA

So how long have you been working
here?

DANNY

Long enough. At first you couldn't
keep people away. Everybody wanted
to help solve the case and figure
out what was killing the
livestock. Then they realised it
was coming from the old mines.

AMANDA

They poisoned the whole island?

DANNY

Not the mines, the floods are the
problem.

(pointing)

See that stream --

Amanda eyes a stream of water flowing through the fields.

DANNY

That wasn't there yesterday. The
changing weather patterns are
bringing in more storms and all
that water is going into the soil
and bringing up zinc and cadmium
and everything else that's down in
those tunnels.

(CONTINUED)

22 CONTINUED:

22

Amanda follows the stream as it leads to a field populated by sheep.

DANNY

You get the picture?

AMANDA

Hence the bottles.

DANNY

This place is one storm away from becoming evacuated.

23 MOMENTS LATER

23

As they walk, the OLD CROMWELLIAN FORT, in all its ominous and twisted magnificence comes into view.

DANNY

Nick had been exploring the cave networks underneath the fort. This way --

A GROUP OF TEENAGE BOYS are socialising nearby. One of the boys has a streak of DYED GREEN HAIR.

Danny leads Amanda down --

24 EXT. CROMWELLIAN FORT, SHORE - CONTINUOUS

24

-- towards the shore at the bottom of the cliff. Amanda studies the fort, which has been destroyed through the years. Only the skeleton structure has survived.

DANNY

So how well did you know Nick?

AMANDA

(scanning the area)

Well enough. He was family.

DANNY

Not anymore?

(ref the path)

Watch your footing.

Amanda and Danny arrive at the shore where a CAVE ENTRANCE awaits.

AMANDA

Nick seemed to think so.

(CONTINUED)

24

CONTINUED:

24

She is taken aback by the rock face - she clenches her eyes shut for a moment and then composes herself.

DANNY

What is it?

AMANDA

It's the -- patterns on the rocks.
Freaks me out.

They stand at the entrance of the --

25

INT. CAVE, SHORE - CONTINUOUS

25

Once there was an archeological dig site here. Now the devastation cause by the storm has ruined it. Pieces of broken glass and pieces of torn canopy fabric lay on the ground.

An assemblage of rocks, repeating patterns and holes in the walls of the cave makes Amanda anxious.

She is overtaken by the patterns --

26

EXT. ROCKY SHORE - DAY - FLASHBACK

26

Amanda's head is sticking out of the water. She is gasping for breath and clinging to a series of rocks. Algae and dirt are coming out of the holes. It creates a series of disturbing patterns that resemble the walls of the fort.

27

EXT. CAVE, SHORE - PRESENT

27

Amanda recomposes herself and they enter --

DANNY

Are you sure --

AMANDA

I told you, I'm fine.

Danny gets on his haunches and examines a MASK in the corner of the cave. The mask features two long tusks emerging from the side. Like a pig or a boar.

AMANDA

It's a Gossip's Bridle. For people who talk too much.

(CONTINUED)

27 CONTINUED: 27

Danny puts the mask down again.

DANNY
"To Connacht or to hell".

Amanda emerges from the cave again --

28 EXT. CROMWELLIAN FORT, SHORE - CONTINUOUS 28

Waves crashing against the walls of the fort.

Amanda ascends up and around a different path to the main fort.

29 INT. CAVE, SHORE - CONTINUOUS 29

Danny spies a passage leading to yet another section of the cave network.

DANNY
There are so many caves around
these parts, he could be anywhere.
(calling out)
Nick!

30 EXT. CROMWELLIAN FORT - CONTINUOUS 30

Amanda is climbing up when she is distracted by A MYSTERIOUS WOMAN standing on the top of the fort. She looks as though she is about to jump off. The mysterious woman looks at Amanda.

The woman IS Amanda.

Amanda is shocked out of her reverie to find Danny with his hand on her shoulder --

DANNY
Why did you run off?

The doppelganger on the fort is gone again and Amanda is left puzzled.

31 MOMENTS LATER 31

Having circled back around the fort to their starting position --

(CONTINUED)

Amanda HEARS YELLING from afar. She sees a LOCAL MAN scolding the kid for dying his hair. The man is overly aggressive with the boy as he pulls him away from the others.

Amanda goes to him --

AMANDA

Hey --

Catches up --

AMANDA

Hey, what are you doing?

She intervenes and separates them --

AMANDA

You're hurting him, stop it.

The man starts yelling at her in rapid fire Irish --

The man is overly aggressive with Amanda as well and Danny interjects.

He speaks Irish to the farmer and calms him while Amanda goes to the teenager to comfort him.

The boy flees.

DANNY

Amanda, it's time to leave --

AMANDA

Right.

Danny takes Amanda away. She keeps her gaze on the boy.

They leave the fort and walk a few more yards until they are safe.

She takes a bottle of water from her bag. Swallows a gulp and catches her breath.

The boy and his FRIENDS pass the two. The boy looks to Amanda to see the woman who came to his rescue.

Amanda hurries to buckle her bag again and gets on her way.

32 CONTINUED:

32

DANNY

Where are you going now?

AMANDA

To school.

33 EXT. SCHOOL - LATER

33

Amanda studies the tiny school. Not much room for students. Only a few rooms altogether.

34 INT. SCHOOL - LATER

34

Amanda enters the school and looks around.

She HEARS VOICES from a classroom and watches as a TEACHER (KAREN, late 30s) and some of the LOCALS are in agitated conference.

Amanda finds a room labeled 'Records'.

35 INT. RECORDS ROOM, SCHOOL - MOMENTS LATER

35

Amanda explores the unimpressive library - a place where reading is not held in high regard.

Amanda is satisfied that this will do.

36 LATER

36

Amanda rifles through the different books and logs in the small room.

A table sits in the centre of the room and it looks onto the school yard where CHILDREN PLAY.

Outside, Amanda notices the boy from the fort. He is clearly shaken by the day's events and sits alone.

Amanda watches as the teacher, Karen, tends to the boy.

Some of the records contain old flyers and newspaper clippings:

A newspaper clipping from the 1800s describes how an AMERICAN MINING COMPANY WILL BE COMING TO HIRE LOCALS ON THE ISLAND. She reads the date on the clipping - 1875.

Someone is watching Amanda --

(CONTINUED)

OLD MINING COMPANY LOGS. Inside, A COMPANY MAP OF THE ISLAND. She carefully unfolds the map onto the table and compares it to her own map.

KAREN (O.S.)

You must be here for Nick.

Amanda looks to see the school teacher at the doorway. A woman a few years older than Amanda. She looks out of place among the islanders --

KAREN

This was where he worked. When he wasn't out on the fort.

AMANDA

I'm trying to piece together his last few days here. Can you tell me if there are any other boxes left over from the Sedona company? I'm hoping it might give me an idea of the places he visited.

The teacher goes to the shelf.

KAREN

They company left in such a hurry the islanders didn't know what hit them. All that's left is the mining village on the west side of the island and some mine shafts. The company were the first to properly survey the island so some of the documents were kept --

She pulls down one more set of ledgers.

KAREN

Mineral deposit locations. Nick was very interested in these for some reason.

She quickly scans them --

AMANDA

He was looking for quartz?

Amanda is busy in the books. She takes photographs of other documents with her phone.

Karen grabs the phone from her hand and looks to the window.

(CONTINUED)

36 CONTINUED: (2)

36

KAREN

That kind of technology can get
you in trouble here.

Amanda retrieves her phone again --

KAREN

I must get back.

Amanda heeds the warning and puts her phone away.

The she finds that one of the books is AN OLD JOURNAL.

37 EXT. NEARBY FARM - MOMENTS LATER

37

Amanda is returning to the village when she sees A
DISTRESSED WOMAN coming from a BARN.

Amanda crosses into the farm to meet her half way and
finds her inconsolable.

Amanda is led to --

38 INT. BARN - CONTINUOUS

38

Inside the barn is a horse, DEAD.

The woman utters an indecipherable word --

ISLAND WOMAN #1

(pronounced ish-ka)

Uisce.

Her husband is grieving.

The woman keeps repeating the word, as if possessed.

Amanda looks at the POOLS OF WATER in the ground.

39 INT. TAVERN LOUNGE - LATER

39

CLAIRE O' KEEFE

Water.

Claire puts a meal on the table. The table is populated
by Darragh, Paul, Danny and Gerard.

CLAIRE O' KEEFE

It means 'water'.

(CONTINUED)

Claire returns to the kitchen where Deirdre is waiting.

Gerard blesses himself and leads a silent prayer.

Amanda looks to the kitchen, still visible through the gap in the doorway. Claire is sitting with her mother and blessing herself.

GERARD O' KEEFE

Amen.

DARRAGH

PAUL

Amen

Amen.

Everyone starts helping themselves while Amanda watches. Danny waits his turn as well.

DANNY

Did you find anything at the school?

AMANDA

Old maps and logbooks from a mining company called Sedona.

GERARD O' KEEFE

Sedona was a quartz mining outfit in the 1800s. Unscrupulous.

AMANDA

I gathered they didn't stick around long.

DARRAGH

They didn't pay either.

GERARD O' KEEFE

The island was under British rule so our people were exploited. Like the natives of your country, Miss Devlin. What you saw out there in the fields is Sedona's legacy 150 years later.

PAUL

The school is filled with records from that period.

AMANDA

I'm going back tomorrow.

The brothers look to their father --

(CONTINUED)

39 CONTINUED: (2)

39

GERARD O' KEEFE

Good.

40 INT. THE TAVERN, UPSTAIRS - LATER

40

Amanda is tired and full. She climbs the last step and goes to her bedroom --

41 INT. AMANDA'S BEDROOM, TAVERN - CONTINUOUS

41

Amanda enters the room and puts her items, including her phone, on the bed.

She takes off her sweater and drapes it over the chair. She takes a bath towel and her toiletries and leaves the room --

42 INT. THE TAVERN, UPSTAIRS - LATER

42

Amanda enters the adjacent communal bathroom across the hall. The SOUND OF THE SHOWER can be HEARD.

She emerges again, having forgotten something --

43 INT. AMANDA'S BEDROOM, TAVERN - CONTINUOUS

43

Amanda enters and then stops. She stares at the bed.

Her belongings have been moved. Her phone is missing.

44 MOMENTS LATER

44

Deirdre, Claire and Danny are gathered with Amanda.

AMANDA

I'm not imagining this. It was right there, now it's gone.

DEIRDRE O' KEEFE

No one's saying you're imagining anything.

AMANDA

Somebody was in my room.

Claire sheepishly enters. Amanda looks to her in an accusing manner.

(CONTINUED)

CLAIRE O' KEEFE

What about Branna?

AMANDA

Who?

DEIRDRE O' KEEFE

Branna is an outcast. A violent woman - a child more like it.

Gerard enters.

GERARD O' KEEFE

If she was in your room, you'd know.

CLAIRE O' KEEFE

She's cursed--

DEIRDRE O' KEEFE

Claire, don't complicate things --

CLAIRE O' KEEFE

It's true. You said so.

AMANDA

Who is she?

Deirdre concedes and indulges them.

GERARD O' KEEFE

Branna is an abomination.

DEIRDRE O' KEEFE

She's touched. She became violent and started killing livestock.

Gerard leaves the room - a sensitive subject for him.

DEIRDRE O' KEEFE

Gerard tries to be sensitive to her needs. We all do. But at a certain point, what can you do?

They look outside as Gerard tends to his pigs.

DEIRDRE O' KEEFE

Last month Branna took the oldest pig. Cut its throat.

AMANDA

You saw this?

(CONTINUED)

DEIRDRE O' KEEFE

We didn't need to. The trail of blood led us right to her.

DEIRDRE O' KEEFE

Not long ago, Branna entered John Mead's farm and killed everything that moved on four legs. We had to call the authorities, but they said they couldn't come out on account of the weather. We searched the entire island and found nothing.

AMANDA

That doesn't help me.

DEIRDRE O' KEEFE

You're looking for ghosts.

It's clear that Amanda is at breaking point.

DEIRDRE O' KEEFE

Claire will set you up in Nick's room if it will make you feel safer.

Claire looks to her mother --

Deirdre approves with a nod which tells her to get the room ready.

INT. THE TAVERN, NICK'S BEDROOM - LATER

Amanda enters Nick's room and finds Claire preparing the room for her.

Claire shuffles away nervously.

Amanda puts her bag away and explores Nick's belongings.

Amanda pulls back the bed sheets, cautious of another spider.

Instead, she finds a SLIP OF PAPER with the words '*Not what it seems*'.

Amanda looks to the doorway. Claire is closing the bathroom door behind her.

46 LATER 46

Amanda lies in bed - one eye on the door - reading from the old journal she found in the library.

The journal entries describe the American outsider's observations of the island. It is described as a terrifying island.

47 EXT. LAKE - DAWN 47

Nightmarish visions of rotting flesh near a lake. Visions of THREE WOMEN SCREAMING by the water.

The SOUND OF SCREAMS invade the dream and build --

48 INT. THE TAVERN, NICK'S BEDROOM - NIGHT 48

Amanda wakes again to the sound of the same SCREAM.

She jumps out of bed and goes to the window.

No sign of the girl from the other night.

Another SCREAM.

Amanda hurries --

49 EXT. THE TAVERN - MOMENTS LATER 49

Amanda emerges from the tavern to find --

GERARD O' KEEFFE

Where is she?

Gerard emerges and joins her with determination and anger, flashlight in hand.

GERARD O' KEEFE

Well? Where did she go?

AMANDA

I don't know. She was gone when I got here.

Gerard rushes to the side of the tavern before Amanda knows what's happening.

No sign of the mad dog.

(CONTINUED)

32.
49 CONTINUED: 49
Gerard's expression changes yet again when he sees the word 'DEVIL' painted on the wall of the tavern.

50 THE NEXT MORNING 50
Amanda and Danny watch as Gerard and Claire struggle to scrub the wall.
Amanda sees MAURICE O' KEEFE, watching from a distance, as before.

51 EXT. BLACKCROSS HARBOUR - DAY 51
Amanda braves the elements at the exposed harbour, watching the boats swaying back and forth in the water.
She checks her watch as if waiting for something that will never arrive.
The HARBOUR MASTER is talking on a phone in a nearby hut before hanging up and signalling to Amanda.
She understands that there are no sails due, nods and goes on her way.

52 INT. SCHOOL, RECORDS ROOM - LATER 52
Amanda sits in the records room of the school again. The table is strewn with old documents and records.
She reads another extract from the journal, correlating the logs with the maps. The extract refers to a rumoured treasure buried on the island. More valuable than all the quartz combined.
Amanda excitedly reads on. A few pages further, she finds another journal entry. The author of the journal is now obsessed with finding this treasure.
ELSEWHERE, SOMEONE WATCHES --
On the next page, Amanda finds a letter hidden in the journal. Recently written - labeled *For Amanda*.

53 INT. THE SCHOOL, CORRIDOR - CONTINUOUS 53
The window in the corridor is thrown CRASHING open and a gust of gale force wind disrupts the documents.

(CONTINUED)

53

CONTINUED:

53

Amanda hurries to the corridor. She CLOSES the door of the records room first --

And then shuts the window. She sees the children being hurried inside again by Karen as the weather takes a turn.

She sees the boy from the fort, this time sporting a SHAVED HEAD. Punishment.

Amanda returns to the records room, not realising that the door to the room is ONCE AGAIN OPEN.

54

INT. SCHOOL, RECORDS ROOM - CONTINUOUS

54

Amanda returns to the room and goes for the letter. The letter is gone.

Amanda starts searching the documents. Searching turns to panic.

She looks at the door and realises that it is open.

Shuts the door, and then studies the room.

Then the SOUND OF FRANTIC FOOTSTEPS --

Karen approaches. Amanda looks up --

KAREN

Something terrible has happened.

55

EXT. ISLAND - DAY

55

Gerard's vicious dog wanders through an overgrown area. The dog is clearly lost. It's leash is still attached.

It goes to a puddle of water, laps at it and then stops at the SOUND OF BARKING nearby. It moves on again.

56

EXT. FARM - CONTINUOUS

56

The SOUND OF BARKING DOGS. The excruciating SOUND of DROWNING LIVESTOCK.

Islanders are up to their knees in water as they wade deeper into the FLOODED FIELD. Somewhere on the island, a bank has burst and the owner of this farm is about to lose everything.

(CONTINUED)

Everywhere, Islanders are struggling to rescue the animals, including Amanda and Karen who work to rescue a sheep.

At one point, Amanda slips on the grass below and her head submerges under the water. It is only for a brief moment as she is helped by a mysterious man - MAURICE. Maurice tries to take Amanda away but she rejects him --

He is somewhat aggressive, but she shouts at him - it is inaudible over the sounds of the chaos.

She breaks free from his grip and returns to Karen as fast as she can move. They carry the sheep back to dry land - Amanda's ears are filled with water and so everything is INAUDIBLE.

The sheep scuttles away from her but is suddenly SHOT DEAD. Amanda is instantly taken aback --

Looks to the man wielding the gun -- THE OWNER OF THE FARM.

As she looks about, she can see the surviving livestock being shot, one by one by other islanders. It is a horrific massacre.

Amanda is delirious and Karen helps her away --

AMANDA

What are they doing --

KAREN

Look at me --

The teacher is holding Amanda's face like she's a nurse --

KAREN

Open your mouth --

She sticks her fingers into Amanda's mouth and forces Amanda to vomit into the grass. Mostly water.

Amanda is in shock and looks back to see the last of the animals killed.

Amanda surveys the field and sees the mysterious figure, MAURICE, standing at the far end, watching, before turning and leaving.

57

INT. CHURCH OF THE HOLY MOTHER - NIGHT

57

The islanders are gathered at the church.

Among them, A WOMAN holding her BABY.

ISLANDER #1

By the latest count, we estimate
that there are no fewer than 23
livestock remaining on this
island.

Restless mutterings from the crowd signal concern --

ISLANDER #1

The flood has destroyed yet
another farm, and with it, our
only remaining supply of fresh
milk. We are losing this battle. I
fear, we must call the mainland.

Amanda watches from the back of the church with Karen.
Danny sits in a nearby pew. More restless mutterings as
the islanders decide for themselves.

Meanwhile, Amanda notices a man, DOCTOR MCCARTHY,
approaching the front of the church and whispering to the
man.

Deirdre looks to them, unable to make out what they are
saying.

The man thanks the Doctor --

ISLANDER #1

Kieran Corcoran has been found
dead --

Gasps --

ISLANDER #1

By his own hand.

Dismay from the crowd.

ISLANDER #1

It is time to call for the
mainland.

Deirdre gets up to leave --

ISLANDER #1

Do you disagree, Deirdre?

(CONTINUED)

Deirdre stops - she looks to the islanders, pitying them as they look to her for guidance or some sense of reassurance.

ISLANDER #1

If you or your husband have
resources that could help our
plight - now would be the time to
share.

Deirdre lets loose the slightest of grins --

DEIRDRE O' KEEFE

The weather is turning again. It
seems even death won't get you off
this rock.

She turns to leave --

DEIRDRE O' KEEFE

Rejoice. Fresh water for our
livestock.

They are insulted by the disrespect she shows as she
leaves.

Amanda joins the teacher outside. The teacher gives her a
cynical look - the look of an non-believer.

AMANDA

Searching for God's authentic
voice. I know their kind.

KAREN

That man had two kids. I taught
them. Most people around here
don't put much stock in education
anymore. He did.

She looks to her YOUNG SON, playing by himself.

KAREN

He lost his father last year. My
husband woke up one morning and
found the grass black and the
sheep dead. Put a noose around his
neck.

AMANDA

The Mead Farm. Deirdre told me
Branna killed them.

KAREN

Anything and anyone except the
truth --

AMANDA

Which is?

KAREN

Look around. The world is
changing. God or nature, they'll
believe what they're told.

AMANDA

No one speaks up?

KAREN

No one has a voice loud enough to
make a difference. O' Keefe either
owns the farms or the supply
lines. Everybody owes him
something.

Amanda notices a bruise on Karen's arm.

KAREN

I tried to gather petitions to
help pay for a scientist to come
and evaluate the place. They
wouldn't hear of it.

She looks at the other islanders going about their
business.

KAREN

This place - it's like we're
sinking. 'Rejoice', she says.

The woman caring for the child - the child is staring at
the ceiling while everyone else looks ahead. The woman
takes notice and looks up.

They make out movement in the rafters - and then a drop
of BLOOD falls on the child's face. And then another.

The woman screams as the congregation direct their
attention to her --

(CONTINUED)

59

CONTINUED:

59

And then to the rafters.

A DEAD SHEEP descends from the rafters, its head in a noose and the rope tied to the beam.

It falls over the congregation, and as the rope grows taut, the sheep's innards spill out onto the aisle in the centre of the church.

Screams follow --

Footsteps above as the perpetrator tries to escape.

ISLANDER #2

Branna --

60

EXT. FIELD - MOMENTS LATER

60

TWO TEENAGERS, seen earlier at the fort, are running.

They come to a stop to catch their breath, looking back at the church - panting and laughing, lauding each other for their handiwork.

TEENAGER #1

(mocking)

Branna --

The other teenager screams as if to mock the girl.

61

EXT. DARRAGH'S HOUSE - CONTINUOUS

61

Darragh is tending to his own livestock, when he HEARS a SCREAM.

Darragh drops everything and goes to the house --

He finds his DAUGHTER standing over Gerard's vicious dog - lifeless.

He turns his daughter away from the dog and looks about, trying to make sense of the situation.

62

EXT. CHURCH OF THE HOLY MOTHER - CONTINUOUS

62

Amanda and Karen --

SCREAMS can be HEARD from inside. They react.

(CONTINUED)

KAREN

It'll be too late before they
realise the truth.

Karen goes to her son and picks him up.

KAREN

I hope you get away soon.

Amanda is left in shock at the chaos as Karen enters her
home nearby.

His daughter is shaken by the sight of the dog and
Darragh investigates.

Then a SHRIEKING SOUND - Branna's unique high pitched
scream. Darragh reacts --

DARRAGH

C'mon sweetheart - get inside.

He reaches inside and grabs a RIFLE.

He marches out into the field with purpose.

Over the slope, he sees Branna nursing a dog who is
clearly struggling. It is GERARD'S VICIOUS DOG, now
submissive and sickly.

DARRAGH

Hey --

Darragh rushes to the dog and Branna flees.

Amanda is returning home when she sees a BONFIRE in a
nearby field.

She traverses the marshy ground to a gathering of
islanders who toss the dead livestock onto the burning
heap.

They wear scarfs to protect themselves from the fumes.
Amanda covers her mouth and nose with her sleeve.

She sees the boy with the shaved head.

AMANDA

Hello.

BOY

Hello.

AMANDA

Do you remember me? We met at the fort.

BOY

Yeah, I remember.

AMANDA

Did you know the man?

BOY

Of course I did. Everyone knows everyone here.

AMANDA

I'm sorry then. People are dealing with this in their own ways it seems.

The boy nods just to agree and be done with her. He is shifty, looking about to see if people are taking notice of him.

BOY

I guess.

AMANDA

How are you dealing with it?

BOY

I just am. What do you want?

AMANDA

I'm just trying to make sure you're okay. I'm not blind to what's happening here.

BOY

Then you know that I'm taking a risk even being seen with you - so why don't you fuck off?

The boy tries to get away from her --

BOY

(louder than normal)
I don't want to talk to you --

(CONTINUED)

AMANDA

Okay, I get it. I get what you're doing. I'll let you go.

BOY

I can't be seen talking to anymore people like you.

Amanda stops --

AMANDA

What other people like me?

No answer. The boy stops, knowing he has spoken out of turn.

AMANDA

What did you mean by that? You mean Nick?

BOY

The other woman.
(nervous)
I have to go.

He leaves, and Amanda is left in the glowing red field as her mind accelerates.

Amanda returns to the tavern and goes to the ledger on the bar. She looks about to see that the coast is clear. Then studies the ledger.

Her name and Danny's...

She flicks back a few days - sees Nick's signature.

Goes even further back. Then finds '*D Corrigan*' scribbled.

And then again, several days further back - Corrigan's name again.

AMANDA

Corrigan.

Scrolls back even further - finds the name of the person once more.

THE SOUND OF ARGUING in the lounge prompts her to close the book fast.

66

INT. TAVERN LOUNGE - MOMENTS LATER

66

Amanda eavesdrops on Paul and Claire.

Gerard stares at his lifeless dog. He is in mourning and downs another glass of whiskey.

Darragh stands before his father and Amanda joins him.

DARRAGH
(ref the mirror)
She was playing with this --

He tosses an old ANTIQUE POCKET MIRROR on the bar. Gerard gives no attention to it.

DARRAGH
Dad, cousin or no cousin --

CLAIRE O' KEEFE
She's a child.

DARRAGH
(to Claire)
Why don't you shut your mouth
until someone speaks to you, yeah?

CLAIRE O' KEEFE
Dad, please don't --

DARRAGH
I don't want to hear it!

PAUL
You said it yourself, she's
cursed.

CLAIRE O' KEEFE
I know how she feels.

PAUL
You wouldn't be acting this way if
it was your professor friend,
would ya?

Darragh leaves.

Then Claire goes for the stairs, realises she has embarrassed herself in front of Amanda and runs up the stairs.

Amanda enters the room. Paul recomposes himself, realising that he might have spoken too loudly.

(CONTINUED)

AMANDA

Gerard - we need to talk.

Gerard motions for Paul to leave him. Paul reluctantly does so.

Gerard pours himself another drink and toys with Claire's ANTIQUE BUTTON.

AMANDA

What did Paul mean just now?

He puts the button down.

Amanda studies the pictures on the wall - Pictures of Gerard O' Keefe in his prime. Pictures of the island in its prime.

GERARD O' KEEFE

Where are you from?

AMANDA

Gerard?

GERARD O' KEEFE

Is it a small community?

AMANDA

What did he mean?

GERARD O' KEEFE

You know the value of home and community. That used to mean something here. Then hell opened up and swallowed the island.

Pictures of Gerard with his prize horses.

GERARD O' KEEFE

They were my pride and joy. After Claire's sister died, they were my reason for getting up in the morning. The rest of the children - well as you've seen - they don't need their old man. Annabel though. She was fragile. Her death hit me hard you could say.

He is losing himself in memory and shakes it off --

GERARD O' KEEFE

One day I woke up and found them dead in the barn.

(MORE)

(CONTINUED)

GERARD O' KEEFE (CONT'D)

It had rained heavily. The fields flooded. Water seeped up from the mine shafts. There was no doubt what had happened.

He pours another glass and downs it hard.

GERARD O' KEEFE

Then the engineers and the experts came in droves, spreading ideas of an exodus. Telling us to leave our home. We've lived on this island for six centuries.

She can see that Gerard is drunk. She slowly takes the glass away from him.

AMANDA

I'm just here for my brother-in-law, Gerard. I know there's something you're not telling me.

GERARD O' KEEFE

We had words - up at the fort. I could see the way he was talking to Claire. Telling her about the world. He was going to take her away from here.

Holding up the antique button.

GERARD O' KEEFE

The only daughter I have left.

Deirdre enters the room and interrupts the proceedings --

DEIRDRE O' KEEFE

I'll be locking up now, my dear.

(shooting a
threatening gaze at
Gerard)

Are you coming up?

Gerard realises he's losing control, pulls himself back together and takes a deep breath. He puts the button in a desk drawer --

GERARD O' KEEFE

It's late.

AMANDA

Gerard --

(CONTINUED)

DEIRDRE O' KEEFE

(sharp)
That's enough --

Amanda knows better than to continue her questioning.

Deirdre gives her a polite smile before leaving the room.
Amanda pockets the antique mirror and the button.

INT. THE TAVERN, NICK'S BEDROOM - LATER

Amanda returns to her room to find Claire sitting on the bed and wiping her tears.

AMANDA

Claire?

Amanda approaches and Claire opens her palms to reveal the phone.

CLAIRE O' KEEFE

They told me to take it.

AMANDA

Who told you?

Claire is too afraid --

AMANDA

Claire, how long has Danny been staying here?

CLAIRE O' KEEFE

He comes and goes.

AMANDA

Has anyone else come through here?
Anyone like me?

Claire nods, struggling to conceal traitorous tears.

AMANDA

Who? Claire, look at me. Who came here?

CLAIRE O' KEEFE

Nick.

Amanda is losing this struggle for information --

AMANDA

Claire, did someone kill Nick?

(CONTINUED)

67

CONTINUED:

67

Claire looks to the window.

AMANDA

Claire?

CLAIRE O' KEEFE

Nick should get back before the
storm comes in again.

Amanda bends down before Claire. She places the button in
Claire's hand. Claire turns her attention to Amanda.

AMANDA

Claire, let's go find Nick.

CLAIRE O' KEEFE

He's at the fort. You can't go to
the fort.

AMANDA

You can show me another way, can't
you?

Claire looks at the button.

Wipes her tears and nods with newfound purpose.

68

EXT. BACK ROADS - NIGHT

68

Trees are silhouetted by moonlight.

Amanda and Claire walk the back roads of the island but
Claire's disability slows them down.

Amanda fashions a cane from a nearby tree branch. She
bangs the cane off the road to test its strength.

A SHRIEK IN THE DISTANCE. Amanda and Claire look in the
direction --

Claire puts her finger to her lips slowly. Shhh.

Amanda gives the cane to Claire.

69

MOMENTS LATER

69

On the road again - Claire is walking faster than before.

Amanda is looking around, cautious of the environment.

They reach a crossroads.

(CONTINUED)

AMANDA

Which way?

Claire points to an old fence --

Amanda is hesitant, looking ahead at the alternative avenues.

Claire has already started prying open the fence for her.

Amanda reluctantly follows her lead.

Coming out the other side, they find themselves on a slippery slope that leads into a deeper area of land.

EXT. ABANDONED MINE - LATER

Amanda and Claire arrive at the abandoned mine.

They HEAR VOICES.

MEN DRESSED FROM A DIFFERENT TIME WITH FIRST WORLD WAR GAS MASKS EMERGE FROM THE MINE.

Claire panics --

AMANDA

It's okay --

Claire shakes her head repeatedly and runs away.

The figures stop moving. They can tell that someone is out there.

Amanda is concealed by the darkness. Desperately trying not to breathe.

The figures stand on the ridge and look out.

Amanda freezes and closes her eyes.

A SHRIEK IN THE DISTANCE.

Amanda opens her eyes again and finds that the men have vanished.

INT. ABANDONED MINE - MOMENTS LATER

Amanda arrives at the entrance of the shaft, covers her face and descends into the mine --

(CONTINUED)

71

CONTINUED:

71

Coughing --

Amanda follows the shaft deeper and deeper --

She uses her phone to light up the dark passages.

She sees a SHADOW OF A FIGURE MOVING.

She follows the shadow and sees a hint of Branna up ahead.

Branna flees --

And then finds a narrow and ancient spiral stairs.

She climbs the stairs --

A tight squeeze --

72

INT. CRYPT - CONTINUOUS

72

And arrives in another chamber.

The flashlight on the phone illuminates sections of the surprisingly large room. An underground chamber --

No gas - Amanda is able to remove her scarf from her nose.

Amanda studies the walls --

The same word written repeatedly throughout.

AMANDA

Uisce.

Amanda studies the room and finds an exit --

AMANDA

What is this place?

Emerging from the room --

73

EXT. CROMWELLIAN FORT - CONTINUOUS

73

She realises she is at the fort.

Wind howls and rain batters her.

Tarpaulins blow and SOUND HARSH. The excavation site is upturned.

(CONTINUED)

EXHUMED GRAVES litter the site.

Amanda approaches --

The SOUND OF FOOTSTEPS FOLLOWING.

Amanda stops walking, then the footsteps stop. She knows.

She finds an industrial flashlight and picks it up.

It springs to life and pierces the darkness.

AMANDA

Branna?

THE WIND SOUNDS LIKE SCREAMING.

She scans the open courtyard but finds nothing.

AMANDA

Branna?

Just the SOUND of SHRIEKING WIND.

Amanda studies the headstones on what few graves have them.

On one of the grave stones, she sees the name DEVLIN. As she studies it carefully, she sees the name has been desecrated.

She moves the flashlight slightly and it picks up a figure right next to her in the darkness - BRANNA.

She flees as soon as the light hits her and Amanda falls backwards in shock and fright.

She then scrambles for the flashlight and stands up to investigate. Amanda tries to find her again in the darkness. The light dies.

AMANDA

Branna?

Amanda investigates the grave site.

AMANDA

I promise, I won't --

Amanda reaches for her phone and turns on the flashlight feature. It isn't as powerful as before but it is enough to --

(CONTINUED)

Find Branna again - Amanda is taken off guard. Branna flees like before.

Amanda can HEAR CRYING.

She goes to the edge of the cliff and finds THE THREE MYSTERIOUS WOMEN holding lanterns by the nearby cove with A FOURTH WOMAN struggling in the water.

Amanda makes her way down to the shoreline.

The route is treacherous - rocks slipping from under her feet.

She loses control, stumbles --

Regains her footing - redirects the flashlight to the water. Sees the woman struggling and losing.

At the shore, Amanda sees the women holding lanterns and looking into the water. A FIGURE FLOATS in the water.

Amanda dives into the water --

Amanda emerges from the water - panicking.

AMANDA

Ellen?

Amanda looks about --

Takes another deep breath and submerges herself again.

Dark colours. Hard to see.

Amanda rises from the depths again. Gasping for air --

AMANDA

Ellen --

She goes under once more --

Searches the depths before finally seeing the hint of a figure in the water beneath her.

She reaches for the figure --

But is suddenly pulled back --

75 EXT. CROMWELLIAN FORT, SHORE - THE PRESENT 75

Amanda is pulled from the water and dragged to the shore.

She coughs and sputters water. NIGHTMARISH PATTERNS flash before her eyes from the rocks and the shoreline. She clutches A RUCKSACK IN HER HANDS.

Danny examines her and checks her condition.

Amanda realises she has been saved by him.

76 EXT. FARM - CONTINUOUS 76

A PIG PEN. A FIGURE is lying in a pile of mud and animal faeces as startled pigs scuttle about the pen.

77 EXT. CROMWELLIAN FORT, SHORE - CONTINUOUS 77

Amanda and Danny sit in the cave as the rain pours outside. They watch as the waves crash.

AMANDA

I swear, I saw her.

DANNY

Who did you see?

AMANDA

My sister.

Amanda looks to Danny --

78 EXT. FARM - CONTINUOUS 78

The figure in the pen is Claire. She is yelling out, but her cries are muffled due to a metallic object obscuring her mouth.

DANNY (V.O.)

I lost a brother. Cancer. I know how it feels. I don't even remember what he looked like. He died when I was so young.

A light appears inside the house and the door opens.

DANNY (V.O.)

I think I see him though from time to time.

(MORE)

(CONTINUED)

78 CONTINUED: 78

DANNY (V.O.) (CONT'D)

I see someone on the road and
think, I wonder if he would have
grown up to look like that.

The woman of the farm comes to investigate the startled
pigs --

But she is horrified to find Claire --

79 EXT. CROMWELLIAN FORT, SHORE - CONTINUOUS 79

Amanda watches the waves --

AMANDA

I tried everything I could to save
her. Nothing was ever enough. Nick
blamed himself. I blamed myself.

Amanda stands up --

80 EXT. FARM - CONTINUOUS 80

The woman at the farm is at a loss. Horror written across
her face.

CLAIRE O' KEEFE
(muffled)
Help me.

81 EXT. CROMWELLIAN FORT, SHORE - CONTINUOUS 81

Amanda grows more focused.

AMANDA
(ref to the water)
He's out there. And I was too late
again.

82 EXT. FARM - CONTINUOUS 82

Claire is writhing in pain, the tusked gossip's bridle
clamped to her face and her tongue trapped in the device.

Her head resembles a tusked boar among the pigs in the
pen.

83 EXT. CROMWELLIAN FORT, SHORE - CONTINUOUS 83

Amanda shovels sand with her hands to form a hole. She buries the bag in the shore and then covers it over again.

She puts several stones on the makeshift grave and stands up again.

84 EXT. VILLAGE - NIGHT 84

Amanda is returning to the village when she sees a hostile gathering.

Some of the islanders are berating and heckling the boy with the shaved head, who stands in the centre of the group as he is beaten by others.

The boy's PARENTS stand to one side in shame and do nothing to intervene.

Amanda interferes --

But gets pushed to one side.

Deirdre watches from the edge as the island threatens to tear itself apart. She returns to the tavern.

Gerard watching from inside the tavern. He turns away again.

85 INT. ISLANDER'S HOME - LATER 85

The boy has been seriously beaten and is resting in bed. Doctor McCarthy sits with him.

Amanda stands next to the bed. Karen watches over him as well.

MCCARTHY

He'll be fine.

KAREN

No he wont.

Amanda looks to the boy's parents in the next room. They are torn between shame and fear. They don't deserve to be in the room.

AMANDA

What do we do? He can't stay here.

(CONTINUED)

85 CONTINUED:

85

MCCARTHY

He needs a boat.

Amanda understands. She puts pieces together in her head.

MCCARTHY

I'm sorry but I have to go check
on Claire --

He takes his belongings and leaves.

AMANDA

What's wrong with her?

86 INT. TAVERN LOUNGE - MOMENTS LATER

86

Amanda is walking through the bar with purpose --

AMANDA

Where is she? I want to see her --

PAUL

She needs rest.

Amanda goes --

87 INT. UPSTAIRS, TAVERN - CONTINUOUS

87

And opens the door to --

88 INT. CLAIRE'S BEDROOM - CONTINUOUS

88

Amanda stops when she sees Claire sitting on the bed with
her back to her. DOCTOR MCCARTHY is treating her. Claire
gives agonising groans and the bed is littered with red
bandages.

Deirdre is standing watch. Her presence is intimidating.

AMANDA

Claire?

CLAIRE O' KEEFE

(muffled groans)

Claire turns around and reveals a HORRIFIC MOUTH INJURY,
blood seeping from her lips --

(CONTINUED)

88

CONTINUED:

88

CLAIRE O' KEEFE

(muffled)

Amanda --

Her tongue ripped out, she speaks more than she should and more blood oozes from her mouth. The doctor tries to catch it with a towel.

Claire is made more upset by the moment and Amanda leaves, closing the door behind her.

89

INT. THE TAVERN, NICK'S BEDROOM - MOMENTS LATER

89

Amanda takes refuge in the bedroom. She slams the door and locks it. Leaning against the door, she tries to comprehend what she has seen.

The GROWING SOUND OF FOOTSTEPS outside the door can be HEARD.

Amanda grows nervous.

She peers through the keyhole - she can make out two figures. Paul and Darragh.

She holds back tears - barely. Terrified.

DARRAGH (O.S.)

Amanda, we need to talk.

The door shakes with a bang as though hit by a battering ram. Amanda screams and tries to hold the door with all her might.

Another bang.

RAM, RAM, RAM.

90

INT. THE TAVERN, UPSTAIRS - CONTINUOUS

90

The brothers are making fast work of the door.

91

INT. THE TAVERN, NICK'S BEDROOM - CONTINUOUS

91

Amanda tries with all her might to hold the door --

RAM.

Then nothing.

(CONTINUED)

91

CONTINUED:

91

Amanda, realising the barrage has stopped, dares to spy the hall from the keyhole. She can hear footsteps descending the stairs.

Amanda hurries - time is precious - she begins packing her rucksack.

When she HEARS FOOTSTEPS - faster than before and with more purpose, approaching the door again.

HAMMERING this time. SOUNDS like a SLEDGEHAMMER. Splinters fly off the door --

Amanda resists crying but can't help but scream --

She goes to the window and tries to open it. It won't budge.

The hammer makes light work of the hinges and the door opens --

Just as Amanda opens the window and throws her bag out first.

Darragh and Paul enter, sledgehammer in hand --

And Amanda braves the elements --

92

EXT. THE TAVERN - CONTINUOUS

92

A storm blows. Wild as hell.

Amanda has injured her leg but it doesn't stop her from running as fast as her body will carry her.

93

EXT. ISLAND - NIGHT

93

Amanda carries herself through the wilds.

FLASHLIGHTS chase her.

94

INT. THE TAVERN, NICK'S BEDROOM - CONTINUOUS

94

Deirdre and Gerard watch her from the window.

95

EXT. ISLAND - CONTINUOUS

95

Amanda shields her face from the rain and the wind as she tries to navigate through the woods.

(CONTINUED)

95

CONTINUED:

95

Dodging loose branches and the like.

Amanda sees an abandoned cottage in the clearing. She looks back to the flashlights and studies her surroundings.

She runs to the --

96

INT. ABANDONED COTTAGE - CONTINUOUS

96

And bursts the door inwards.

She falls in.

Picking herself up, Amanda closes the door and hides in the corner behind old furniture.

She can see the flashlights moving outside.

HEARS THE DOOR OPENING.

FOOTSTEPS COMING CLOSER.

Amanda takes hold of a piece of wood from the ground and -
-

As the figure presents itself before her, she lunges for it.

The man before her, dressed in an old WW1 gas mask (seen earlier at the mine entrance), catches the piece of wood and stops Amanda.

He shines the flashlight in her face and blinds her.

She stops and looks at the man as he reveals his identity
- MAURICE O' KEEFE.

97

INT. MAURICE O' KEEFE'S HOME - LATER

97

A small cottage that has been lived in for a long time.

Maurice resembles his brother Gerard, but is younger in appearance. Equally hard though. He offers Amanda a cup of tea as she warms herself by the fire.

MAURICE

You can rest here. Are you hurt?

She is hesitant to make herself comfortable.

(CONTINUED)

MAURICE

You can trust me.

AMANDA

I don't trust anything on this rock.

MAURICE

You've been spending too much time around my brother.

Maurice is checking on the fire. Loses himself in the flames.

AMANDA

Gerard is your brother?

MAURICE

Everyone on this island is connected in some way.

AMANDA

I came here to find my brother-in-law. Now I know for sure he's dead.

Amanda can't summon the words.

MAURICE

This place deals in death.

INSERT

FLASHES OF 17TH CENTURY WOMEN MARCHED INTO THE OCEAN BY MEN, KICKING AND SCREAMING.

MAURICE

It cries out for it.

Maurice loses himself in memory.

MAURICE

We've been drowning in innocent blood for centuries. We wade deeper and deeper against the waves.

INSERT

FLASHES OF WOMEN CHOKING ON VIOLENT WAVES CRASHING OVER THEM. One of the women pulls a MAN into the water with her. Rips his coat open and the antique button falls. The same button Claire had in her possession.

(CONTINUED)

MAURICE

Until we drown or we are carried
back to shore. But we never leave.

INSERT

FLASHES OF WOMEN FLOATING ON THE SURFACE OR SINKING TO
THE BOTTOM.

Amanda is respectfully silent.

MAURICE

Everyone comes to this place
looking for Francis Drake and
Grace O' Malley. And they take a
little bit more of this island
away with them when they leave.
Nobody wants to accept the truth --

AMANDA

What truth?

MAURICE

Drake was never here.

Amanda takes notice --

AMANDA

That's not possible.

MAURICE

He was never here, because O'
Malley was never here.

AMANDA

Twenty four women were drowned on
this island. They were marched out
to sea by Drake and his men
because he was looking for O'
Malley.

A story Maurice has heard too many times. He is bored by
it.

AMANDA

You're telling me no one died
here?

MAURICE

You sound disappointed.

Amanda is puzzled.

(CONTINUED)

AMANDA

Women died here. A lot of women.

MAURICE

But not by Drake's hand. Or by any Englishman.

AMANDA

Then tell me --

MAURICE

My dear. We did it.

Amanda is surprised --

MAURICE

Our ancestors.

MAURICE

The island's history is steeped in pagan beliefs. But like the rest of Ireland, it had become a breeding ground for extremism. There wasn't room for both ways of life and so we purged the island of anything that wasn't in line with the new ways.

AMANDA

My God.

MAURICE

Surely this can't be that surprising for someone like you. They burned pagans at the stake. We drowned ours.

Amanda sees the big picture finally.

MAURICE

And we've been cursed for their actions ever since.

He stands up.

Amanda has a realisation --

AMANDA

A curse --

Maurice looks to her.

(CONTINUED)

MAURICE

My brother and his family would
have you believe as such. He feeds
off fear. But our island - she's
dying.

MAURICE

If there is a God - he's taking
the piss.

AMANDA

But that's not what they're afraid
of.

INSERT

FLASHES OF THE WAILING SISTERS, THE MYSTERIOUS WOMEN THAT
AMANDA HAS BEEN SEEING, COLLECTING THE BODIES FROM THE
SHORE AT THE COVE.

AMANDA

I've been seeing things.

MAURICE

The Wailing Women.

AMANDA

Yes. Who are they?

MAURICE

Three sisters. They aren't real,
if that's what you're wondering.

INSERT

THEY ARE BRAVE AND STRONG WOMEN - RISKING THEIR OWN LIVES
OUT OF RESPECT FOR THE VICTIMS OF THE MASSACRE.

MAURICE (V.O.)

They're a remnant of long ago.
Every island had them then.

INSERT

THEY MOURN AS THEY BURY THE BODIES. THEY CRY OUT IN THE
NIGHT.

MAURICE (V.O.)

They cry out for the dead.

Amanda finds a picture of Branna with Maurice during
happier times. Holding a dead fox after a hunting party.

(CONTINUED)

Maurice turns and finds Amanda looking at the picture. He is lost for words --

AMANDA

Your daughter is continuing their legacy.

MAURICE

My daughter is as much a victim as the women in the story.

AMANDA

It's not just a story. Not for them. Not for me.

ISLANDER #2

(emerging from the kitchen)

It's ready.

INT. MAURICE O' KEEFE'S HOME, KITCHEN - LATER

Amanda and Maurice sit for dinner.

Maurice leads a silent prayer. Amanda reluctantly plays along.

MAURICE

(blessing himself)

In the name of the Father, the Son and Holy Spirit.

Amanda blesses herself, but it is unconvincing. The sign of someone who was raised in Christian beliefs but has since forgotten them.

Then they begin to eat. A glass of water is placed before her. She is hesitant to drink from it.

Then Maurice drinks from his glass. Amanda reluctantly joins him.

MAURICE

I've watched you with her. She doesn't fear you like she does everyone else. She looks at you the way she looked at her mother.

AMANDA

I don't understand why you can't just leave with her.

Maurice puts down his food.

MAURICE

It's an insular world. And nobody leaves unless they are willing to pay the price.

AMANDA

So you're afraid of Gerard.

MAURICE

You think my brother holds a gun to our heads? Most of us wouldn't know what to do if we boarded the ferry tomorrow. Most of us have nowhere else to go.

ISLANDER #2

We're not stupid people, they wouldn't want us on the mainland.

MAURICE

Some day soon, our community will end. But you will help us to tell our story to the world.

The islander sings an old Irish song as they sit by the fire.

Amanda steps out --

Into the wild.

She covers herself from the elements and goes towards the outhouse next to the barn.

As she approaches the barn, she notices a light inside.

She pries the door open and looks in --

DEAD PIGS hang from the rafters and on a table, ANOTHER ISLANDER is skinning the animal and carving meat from the carcass.

The islander looks to her menacingly as though she is intruding. Amanda starts putting pieces together in her mind.

She turns around and sees Maurice standing over her.

AMANDA

These are Gerard's livestock.
You're killing them?

MAURICE

He has the water, but at least
he'll starve.

A realisation washes over her --

AMANDA

That's monstrous --

MAURICE

Starvation is monstrous.

AMANDA

They're blaming your daughter for
all of this.

MAURICE

She's become too wild. Like an
animal. And that's why you will
take her away from this.
Blackcross was never no good to
anybody, least of all to Branna.

Amanda is processing everything - and staring out at the
darkness.

MAURICE

I told you that it would only take
one bad storm. I fear that storm
has come.

AMANDA

Quiet --

Amanda is transfixed by the darkness ahead --

MAURICE

What is it?

Then a small light appear - fire. And another, and
another. MOLOTOV COCKTAILS --

(CONTINUED)

AMANDA

Run!

The strangers emerge from the darkness - revealed as Darragh and Paul, as well as some of the islanders.

The house is lit up.

AMANDA

Maurice, we have to leave --

MAURICE

I'm right here, Darragh --

AMANDA

He's not here for you. You have to tell me where she is.

Maurice is overwhelmed by the destruction of his house.

AMANDA

Maurice - you said she's an animal. Look what happens to the animals on this rock.

Maurice looks at the pigs in the barn.

AMANDA

You want me to help her, let me.

Maurice thinks for a moment as Darragh approaches slowly.

MAURICE

This way --

Maurice and Amanda run into the darkness. Darragh pursues.

Amanda and Maurice flee into the darkness once more, running away from screams and orange light behind them.

Maurice stops --

MAURICE

Get to the fort. She'll be hiding there. It's where her mother used to take her.

Amanda sees Darragh closing in --

102 CONTINUED:

102

MAURICE

Help her.

Maurice leads them on a wild goose chase.

Amanda goes it alone.

103 EXT. CROMWELLIAN FORT - LATER

103

Amanda braves the storm and arrives at the fort. She is out of breath.

She enters the grounds and HEARS SOUNDS OF SHOVELLING.

She creeps further into the grounds to find the FARMER (from her first encounter with the fort) digging up one of the exhumed graves.

Amanda grows more interested, but unbeknownst to her, Branna is slowly creeping up behind her.

The farmer puts down the shovel and drags a body, NICK, into the grave.

Amanda's eyes widen as she recognises her brother-in-law.

AMANDA

(going for him)

Nick --

But as soon as she budes, Branna reaches and prevents her. She covers Amanda's mouth and presses her against the wall.

The farmer stops for a moment and looks.

Amanda stares Branna in the eye as she keeps one on the farmer. Both remain unseen.

The farmer chalks it up to the wind and continues.

Amanda is escorted around the back of the fort.

104 INT. CROMWELLIAN FORT, CRYPT - MOMENTS LATER

104

And into the crypt.

Branna motions for her to sit and to keep quiet.

They peer out at the farmer who is still burying the bodies. He finishes his work and leaves.

(CONTINUED)

104 CONTINUED:

104

Amanda sits back and tries to rest. Desperately tries not to lose it.

She watches as Branna searches through her bag for food.

Branna removes two chocolate bars and offers one to Amanda.

Amanda takes it.

AMANDA
(mutterings)
Jesus Christ --

105 LATER

105

Amanda is calmer now.

AMANDA
You don't speak, do you?
Branna doesn't even acknowledge her.

106 LATER

106

Branna is carving more lines into the wall.

Amanda watches her.

AMANDA
Did you draw all these?
No response.
Amanda picks up a stone and starts carving --
A-M-A-N-D-A
Branna looks to her.

AMANDA
Amanda. That's my name.
Branna understands.

AMANDA
(pointing to Branna)
Branna.
B-R-A-N-N-A carved on the wall. Branna smiles.

(CONTINUED)

Amanda smiles.

AMANDA

You understand.

AMANDA

Branna, how do I get out of here?
Off this island.

Branna isn't responding, just drawing on the wall.

AMANDA

Branna? Are you listening to me?

She isn't. Just scratching on the wall.

Amanda is getting anxious --

AMANDA

Branna?

Branna stops what she is doing altogether.

Amanda turns Branna towards her. Branna has a glazed and vacant look in her eyes.

AMANDA

Branna, do you know where you are?

Branna is lost --

And then suddenly, her muscles contract and she becomes like a board - stiff and heavy as she falls into Amanda's arms.

AMANDA

Branna!

Her fists clench tight and snap the chalk - her neck extends. Her eyes forced wide open, like someone possessed.

And then she starts jerking sporadically and violently.

Amanda does everything she can to make her comfortable during the SEIZURE.

Branna's convulsions lead to a SHRIEKING SOUND --

Uncontrollable shrieking. It is deafening for Amanda, who closes her eyes, and nurtures the child as best as she can.

(CONTINUED)

106 CONTINUED: (2)

106

Together, they weather the storm...

107 LATER

107

Amanda is holding Branna. Never lets her go.

Branna is staring at the wall, her eyes still maintaining that possessed look, but it is one of trauma and exhaustion. The seizure has passed.

Branna turns to Amanda.

AMANDA

How are you feeling?

Branna opens her hand, which was clenched shut earlier - she drops the chalk, now broken in two pieces.

Amanda pulls back Branna's hair to reveal a filthy face.

Amanda looks around and finds a half filled bottle of water and she fashions a cloth from a spare shirt in her bag.

AMANDA

Let's see if we can do something about this.

She dabs the water on the cloth and begins gently cleaning the girl's face.

AMANDA

You're quite brave to be living out here all alone. Like Banba, the great warrior.

Branna doesn't respond.

AMANDA

Do you know the story of Banba?

AMANDA

A very long time ago, a woman called Cesaire left Egypt and sailed with an army of men and women to Ireland. She was the first woman to land on Ireland.

Continues washing.

(CONTINUED)

AMANDA

She had forsaken the god of Noah
and adopted a golden moon as her
god instead. The relic was said to
have been passed down by
Saraswati, the Goddess of learning
and knowledge.

AMANDA

Ireland was a new land, where no
sin had been committed. One of the
men in her care, Fintan, sought
the relic for himself and murdered
Cesaire.

She is continuing her washing. Branna is paying interest.

AMANDA

After her death, the women were
leaderless and they took the idol
to the caves as a catastrophic
flood decimated the land.

Amanda becomes more theatrical in her actions --

AMANDA

All the women perished but for
one, a great warrior called Banba.
Banba was Cesaire's closest friend
and she had trusted Banba with the
golden relic. The men chased
Banba, all across the country.
Banba was just a child but she was
brave and fierce.

Amanda finishes.

AMANDA

Look at you.

Branna is clean now.

AMANDA

See for yourself.

She removes the pocket mirror, Branna's mirror, from her
bag and uses it to show Branna her reflection. Branna
recognises the mirror as her own and is surprised by
Amanda for returning it.

Branna starts crying.

Amanda sees Branna for who she really is.

108 INT. THE TAVERN - LATER

108

Gerard is standing at the bar. He is busy wiping down the surface.

PAUL

Everyone has been taken care of.

PAUL

More will come, no doubt, but by the time they arrive everyone will have their stories straight.

Just keeps cleaning --

DEIRDRE O' KEEFE

And the woman?

PAUL

Still no sign.

DEIRDRE O' KEEFE

She'll go to the fort. She's looking for the girl.

PAUL

The girl won't come quietly.

DEIRDRE O' KEEFE

Use the father.

PAUL

(to Gerard)
He's your brother?

Gerard looks to his boy. Paul understands --

Paul grabs his coat.

109 INT. CROMWELLIAN FORT, CRYPT - LATER

109

Amanda is studying the carvings on the crypt wall.

She rubs her hand along the wall to follow the other drawings. Drawings of people. Drawings of houses.

AMANDA

This is your life?

A stick figure of a child. She moves her hand across the wall to the next drawing - a monstrous child.

(CONTINUED)

She looks to Branna who is stirring.

Branna sits up and looks to Amanda.

AMANDA

You weren't always like this, were you?

Branna goes to the wall.

She points to the wall. The child.

AMANDA

You?

Branna motions for a group of stick figures surrounded by red. It is an angry and violent image.

She gestures towards them, as though scared by them.

AMANDA

These are the others. You're afraid of them.

Branna slaps the image with her hand --

AMANDA

Not scared. Angry.

Branna motions for a drawing of dead animals.

AMANDA

I see.

Amanda studies the wall. The wall tells a story.

Amanda points to a crude drawing of a house with three stick figures standing outside. A man, woman and child.

She points to the man --

AMANDA

Your father?

Branna angrily scratches him out of the drawing, leaving only the child and the mother.

AMANDA

You miss your mother. Is she gone?

Branna, for the first time, provides a human response. A nod.

(CONTINUED)

Amanda understands the situation.

AMANDA

Branna we need to get off this island.

Branna looks at her - puzzled.

AMANDA

We can leave this place. Together. Do you want that?

Branna doesn't move --

Then goes for her bag and starts packing.

AMANDA

We need to get to the school. I saw a phone there and we can call for the boat.

Branna shakes her head.

AMANDA

No boat?

Branna goes to the wall and draws a crude boat. Then points to the image of Gerard in the centre of the islander.

AMANDA

He owns the boats.

Branna nods.

AMANDA

What about the Priest?

Branna doesn't understand.

Amanda takes the chalk and draws a cross on the wall.

AMANDA

Does he own the priest?

No response as Branna studies the cross --

AMANDA

I'll take that as a no then. We call the priest.

Branna and Amanda grab their belongings and get ready to leave.

(CONTINUED)

109 CONTINUED: (3)

109

Branna takes the letter which she stole earlier and discreetly places it in Amanda's rucksack. Amanda notices but doesn't say anything.

She takes her bag and plays along.

As they leave --

PAUL (O.S.)

Amanda!

Amanda stops and protects Branna.

110 EXT. CROMWELLIAN FORT - CONTINUOUS

110

Darragh, Paul and their goons are holding Maurice hostage.

He is being dragged to the cliff edge.

PAUL

Amanda - get out here now. I know you're watching.

111 INT. CROMWELLIAN FORT, CRYPT - CONTINUOUS

111

Branna watches from a crack in the wall as her father is pulled to the fort.

Amanda can see --

AMANDA

Jesus.

Branna watches as he is pushed to the edge --

112 EXT. CROMWELLIAN FORT - CONTINUOUS

112

Paul grabs Maurice's hair --

PAUL

Call her --

MAURICE

Branna!

113 INT. CROMWELLIAN FORT, CRYPT - CONTINUOUS

113

Amanda watches --

(CONTINUED)

113 CONTINUED:

113

Branna watches --

AMANDA

Branna - turn away.

114 EXT. CROMWELLIAN FORT - CONTINUOUS

114

Maurice on the cliff. The SHARP ROCK CHASM below.

MAURICE

Branna --

He hesitates --

Paul nods --

One of the other islanders is brought forward, pleading.
Terror in his eyes as he is edged towards the emptiness --

115 INT. CROMWELLIAN FORT, CRYPT - CONTINUOUS

115

Amanda looks to the passageway that leads to the mine.

116 EXT. CROMWELLIAN FORT - CONTINUOUS

116

Darragh can see movement and shifts in light between the
cracks of the crypt wall.

He moves towards the fort.

At the cliff, Maurice has his last chance as the islander
is urged ever closer to the edge --

PAUL

Call her --

Paul pushes the islander over the cliff - panic and
screams fade into THE SOUND of CRASHING WAVES.

Maurice shows true fear now as it is his turn.

Pushed to the edge.

Maurice looks down to see the sprawled shape of the body,
not quite taken out to sea - trails of blood seeping from
the body.

MAURICE

Branna - I'm sorry.

(CONTINUED)

116 CONTINUED: 116

Paul accepts that he won't get any cooperation from Maurice and pushes him.

Darragh breaks down the entrance of the crypt --

117 INT. CROMWELLIAN FORT, CRYPT - CONTINUOUS 117

To find it empty.

No sign of Branna or Amanda.

Except signs of escape leading into the mine.

118 INT. ABANDONED MINE - CONTINUOUS 118

Amanda and Branna flee through the mine shaft.

Branna looking back as she is pulled through by Amanda.

119 EXT. ABANDONED MINE - MOMENTS LATER 119

They emerge into the night air again away from the fort.

Amanda is looking to the fort to see how much space they've gained from their pursuers.

Branna is looking at her father's farmhouse. Her home.

BURNING.

120 INT. KAREN'S HOME - NIGHT 120

Karen opens the door to welcome Amanda and Branna. She shuts the door quickly again to avoid detection from other islanders.

121 LATER 121

Having time to rest, Amanda is checking her phone.

AMANDA

It's no good. I won't be able to get a signal here.

KAREN

There's a radio at the school. Do you think anyone will come?

(CONTINUED)

121 CONTINUED:

121

AMANDA

I don't know. I'll need your help
to get in.

Karen gets up and goes to a table.

Returns with a set of KEYS.

AMANDA

Are you sure you want to do this?

KAREN

There's nothing left here for me.

Amanda stands up.

AMANDA

Branna stays here.

Branna grows anxious and follows Amanda to the door.

AMANDA

Branna, you'll be safe here.

Branna starts groaning and trying to voice protest.

Amanda looks to the teacher, admitting defeat. No use in
fighting Branna.

AMANDA

We'll be back shortly.

122 INT. SCHOOL - LATER

122

Amanda unlocks the door.

She opens the door and enters with Branna.

Branna follows Amanda through the corridor, looking in at
the empty classroom as she passes.

123 INT. SCHOOL, OFFICE - MOMENTS LATER

123

Amanda turns on the light and scans the small room. A
principle's office.

She finds a HAM RADIO in the corner and powers it up.

Amanda starts twisting dials until she gets a clean
signal.

(CONTINUED)

AMANDA

Hello? This is Amanda Devlin, can anyone hear me?

Nothing.

AMANDA

I repeat, can anyone hear me?

Still silence.

She opens a BOOK of broadcast signals.

AMANDA

Okay. C'mon Amanda - you can do a PhD, you can figure out how to operate --

She starts adjusting the signals and a VOICE comes through --

RADIO

(automated voice)
You've tuned to the automated broadcast response system --

AMANDA

Mayday! Mayday! This is Amanda Devlin broadcasting from Blackcross island. We are stranded on the island and need immediate evacuation. Please respond.

Nothing.

AMANDA

Please answer --

AMANDA

Mayday! Mayday! This is Amanda Devlin --

RADIO

This is the Irish Navy vessel 'LÉ Eithne'.

A pool of relief takes hold of Amanda as she hears the response --

RADIO

Tell us your location and we will send word --

(CONTINUED)

123 CONTINUED: (2)

123

Looking at the map --

AMANDA

Yes! We are located --
(reading coordinates)
Latitude 53.685,
Longitude -10.351.
Please hurry!

RADIO

Can you confirm if there are any
injured people in your party?

AMANDA

No injuries. Please, you must
hurry --

RADIO

Stay near this radio. We will be
in touch with further directions.

AMANDA

Thank you!

She hangs up the radio, closes the book and rests easy
for a moment.

124 INT. SCHOOL, RECORDS ROOM - MOMENTS LATER

124

Amanda finds Branna browsing the records.

AMANDA

We're going home.

Amanda checks the clock on the wall and her watch.

Amanda sees a drawing that catches her attention.

Clearing the other documents, she reveals it is a rubbing
of an old necklace. A moon shaped necklace.

AMANDA

Do you remember the story I told
you? About Banba, the great
warrior?

Branna studies the drawing.

AMANDA

(in amazement)
This is what she gave her life to
protect.

(MORE)

(CONTINUED)

AMANDA (CONT'D)

Cesaire entrusted her with this,
shortly before she died and Banba
ran. Just kept running - never to
be seen again. She gave up
everything.

Amanda looks to Branna - like a mother would look at her
daughter.

AMANDA

(quiet awe)

Nick was right.

She starts rifling through other pages and finds a map of
the island made by Nick during his research.

The map is marked with red circles - the fort, etc. One
of the circles is an isolated piece of land separated
from the island.

She reaches for the old diary in the rucksack. Removes
it. Leafs through pages quickly.

She finds the page on the diary. An extract which
describes a cave. A familiar extract she has read before.

AMANDA

"A cave in the sea."

She makes the connection to Nick's map.

THE RADIO --

Amanda goes to the radio.

AMANDA

Hello?

DANNY (O.S.)

(on radio)

Amanda? Where are you?

AMANDA

Danny - I'm so glad to hear your
voice. I've made contact with the
mainland, they're sending a boat.

DANNY

Thank God --

125 CONTINUED:

125

AMANDA

We can go home Danny --

DANNY

Stay where you are, okay?

Amanda begins to freeze up.

DANNY

Amanda?

Amanda is captivated by a newspaper headline underneath the radio manual --

THE HEADLINE READS: *ENGINEER, 41, REPORTED MISSING HAS BEEN NAMED.*

Further reading reveals the name of the woman as DANIELLE CORRIGAN, an environmental engineer from Galway City.

DANNY

Amanda --

126 INSERT

126

Flash of Claire whispering in Amanda's ear at the tavern.

CLAIRE O' KEEFE (V.O.)

Which one of these children is not
like the others?

127 INT. SCHOOL - CONTINUOUS

127

Different photographs of classes through the years line the walls of the corridor.

Branna is peering out the window, when she sees Danny passing by and speaking on a radio handset.

Branna looks to Amanda with incredible concern - Amanda is meeting her stare with equal concern.

INSERT

Flash of Danny attacking Claire outside the abandoned mine while Amanda was hiding.

INSERT

Danny sitting with Amanda on the shore.

(CONTINUED)

DANNY

I lost a brother. Cancer. I know
how it feels.

Amanda drops the radio handset and rushes to Branna --

AMANDA

We need to leave.

They pass one of the class pictures from the 80s. The man
supposedly known as Danny is among the group as a
teenager - named 'MICHAEL O' KEEFE'.

INSERT

The picture of the children on the wall in the tavern.

DEIRDRE O' KEEFE (V.O.)

My youngest, Annabel on the left,
died of TB shortly after that
picture was taken.

128 EXT. SCHOOL - MOMENTS LATER

128

They leave the school to find Danny waiting for them
outside.

Amanda stands before Branna to protect her.

DANNY

Amanda --

AMANDA

There's no boat, is there?

Danny reveals a grin --

DANNY

LÉ Eithne - I was stationed on her
for three years.

AMANDA

So what do I call you?

DANNY

I told you before that you
wouldn't be around long enough to
know my name.

(CONTINUED)

DANNY

People have been coming to this island for centuries trying to take what wasn't there. Nick was no different.

Amanda backs Branna slowly into the school again.

DANNY

There's nothing of value underneath our feet. And still, Nick was determined to find something. He kept looking for that burial site. Do you know what would have happened if he did? Every historian and archaeologist in the country and beyond would have come here. They would have dug up the fields, opened up the mines again. And for what? Some skeletons?

DANNY

I figured we could let him find it, and then we could destroy it. He was so close as well but my father let his anger get the better of him.

INSERT

Gerard going to the fort to confront Nick. An argument breaks out. He kills Nick.

DANNY (V.O.)

He thought he could take Claire away with him at the end of all this. After we dealt with Nick, we thought we had lost the site again. Until we learned you were coming.

INSERT

Flash of Deirdre in the tavern on the first morning --

DEIRDRE O' KEEFE

The records hall at the school is open. He used to spend a lot of time in there as I recall.

Danny gaining on Amanda --

(CONTINUED)

AMANDA

And Danielle Corrigan?

DANNY

She started investigating the island several months back.

INSERT

Claire helping DANIELLE, the female investigator, to place an outgoing call.

DANNY

We had to act fast. Danielle had to be taken care of. We couldn't touch her here otherwise she would have brought the whole country down on us. So we let her escape to the mainland and I caught up with her there instead.

INSERT

Amanda emerging from a bus. Amanda talking to the priest and securing passage. Danny following her aboard moments later after committing his crime.

Backing them into the school --

DANNY

You, we could have fooled. I knew once we got you here, you would have figured out where the site was located. But Branna - there's just no end to what she knows.

INSERT

Flashes of Danny and Gerard, moments after Nick's murder at the fort. Turning to see Branna watching them.

The boy with the shaved head packs his bags to leave the house.

He turns off the lights and closes the door behind him, with his possessions on his back, careful not to wake his parents.

(CONTINUED)

129 CONTINUED:

129

AMANDA (V.O.)

So you'll kill a child. The whole island will go along with this?

DANNY (V.O.)

They will keep the secret. We'll lie to the police. We'll tell them you drowned in a boating accident off the shore with your brother in the storm. As for Branna, they won't even know that she ever existed.

130 EXT. ISLANDER'S HOME - CONTINUOUS

130

The boy joins Karen and her child, who are waiting with their possessions as well. The three cautiously make their escape.

131 EXT. SCHOOL - CONTINUOUS

131

Danny slowly approaches --

DANNY

We're good at burying the past.

Amanda quickly backs into the school and shuts the door.

132 INT. SCHOOL - CONTINUOUS

132

Locking the door, Amanda and Branna run deeper into the building.

DANNY (O.S.)

Amanda!

Amanda silences Branna so as to hide their movements.

133 INT. SCHOOL, CLASSROOM - MOMENTS LATER

133

Amanda and Branna enter the classroom and secretly peer out the window.

They see Danny moving around the side of the building.

Amanda turns to find that Branna has vanished.

Amanda leaves the classroom.

134 INT. SCHOOL, RECORDS ROOM - MOMENTS LATER 134
Branna, channelling the warrior Banba, takes the map,
folds it and conceals it, before escaping.

135 INT. SCHOOL, CORRIDOR - CONTINUOUS 135
Amanda searches for Branna. No sign.
Then suddenly a DEAFENING SHRIEK from OUTSIDE.
Amanda goes to a window and sees Branna outside getting
the attention of Danny.
Branna runs into the darkness. Danny looks around once
more for Amanda and then chases Branna.

136 EXT. ISLAND - MOMENTS LATER 136

137 Amanda follows - chasing after Danny. 137
Danny in pursuit of Branna.
Branna is running.
She stops to find that Danny is no longer behind.
She keeps running.

137 MOMENTS LATER 137
Danny is out of breath and stops upon realising he has
lost track of Branna.
DANNY
Branna!

138 EXT. ISLAND - LATER 138
Amanda is wandering the island.
Nobody around.
Exhausted.
She sees A MYSTERIOUS WOMAN standing further up,
beckoning Amanda.
Amanda runs up into the --

139 EXT. GRAVEYARD - CONTINUOUS

139

To find that the woman is gone again.

AMANDA

Hey!

No sign.

AMANDA

Of course.

Amanda is exhausted. She looks around and finds that she is completely alone as far as the eye can see in this centuries old grave.

She collapses next to a headstone.

Amanda opens her rucksack and removes the diary. Inside, she opens the letter from Nick.

ON THE LETTER:

Dear Amanda, I hope this letter finds you...

Amanda is immediately overcome with emotion. She wipes her tears and continues --

ON THE LETTER:

By now I know I will never leave this island...

They are coming. I will hide in the fort and hope they don't find me before sunrise.

Further down the letter --

With love. Nick.

Amanda folds the letter and breaks down.

Her tears turn to exhaustion and she closes her eyes.

Drops the letter on the ground.

140 EXT. ROCKY SHORE - FLASHBACK

140

Amanda is with FAMILY AND FRIENDS camped out by a rocky shore. A typical backpack holiday set up.

(CONTINUED)

AMANDA

Hey mom, come over here and help
me with the cooker.

Amanda and her MOTHER try to set up a small gas stove. In
the background, Amanda's sister, ELLEN, stands by the
edge of the rocks, high up from the water.

AMANDA

Ellen, are you getting hungry?

Amanda looks to her mother and they both look to Ellen --

AMANDA'S MOTHER

Ellen --

Meanwhile, Ellen, AMANDA'S IDENTICAL TWIN, is lost at the
shore, staring out at nothing and everything.

AMANDA

Ellen --

Ellen jolts back to existence and then turns to them.

Ellen looks down at the rocks and the holes in them. Ugly
images.

Celebrations coming from Amanda's direction --

The stove is lighting.

AMANDA'S MOTHER

Quick, get the food before it goes
out --

Amanda is searching for --

AMANDA

Shit.

(turns to)

Mom, I left the bag in the car.

AMANDA'S MOTHER

Your sister has the keys.

AMANDA

Ellen --

She turns to the rocks. Nobody there.

141 MOMENTS LATER 141

Everyone looking for Ellen --

AMANDA

Ellen --

AMANDA'S MOTHER

Ellen --

142 MOMENTS LATER 142

Amanda running to the rocks. She knows --

Amanda's mother realising what has happened --

143 MOMENTS LATER 143

Amanda descends the rocks and splashes into the water.

Dives down deeper.

Nick running in after her.

Amanda under the water --

Rocks and holes.

Amanda grabs her sister's hand --

144 MOMENTS LATER 144

And drags her sister ashore.

Ellen rests in a formation of ROCKS WITH HOLES.

Family run to them, gather around them.

145 MOMENTS LATER 145

Nick carries his wife away from the water's edge.

Laying her on the ground.

Desperately trying to resuscitate her.

Amanda is held by her mother as she realises Nick's efforts are futile.

(CONTINUED)

145 CONTINUED:

145

Amanda's FATHER calls the emergency services.

146 LATER

146

Amanda sits with her lifeless sister.

People stand by the tents crying or yelling.

Amanda just stares.

EVERYTHING FALLS SILENT.

Amanda looks back to find that the THREE WAILING WOMEN are standing among her family. Her family can't see them.

Amanda has the same clothes as when she is on the island. Same hair. Same general appearance.

Amanda is in a present state of mind. As though transported from the island back in time. The women approach with caution - they are still shy.

Amanda is lost. She needs guidance. She is so overwhelmed and she breaks into tears.

One of the women kneels before her to guide her. The mysterious women aren't so shy now. Amanda demonstrates a level of trust with the woman and holds her sister close.

AMANDA

What I wouldn't have given to be
able to go back to this moment.
And now that I'm here --

Amanda gets tough --

AMANDA

For twelve months I've blamed
myself because I didn't see the
signs. I kept thinking they were
right in front of me and I didn't
see them. You're my twin sister. I
should have noticed something was
wrong --

Amanda the tears flow. The other women kneel.

AMANDA

But the truth is Ellen, I didn't
see it because it was already too
late.

(MORE)

(CONTINUED)

AMANDA (CONT'D)

We had become distant and I had
already lost you long before that.
And for that Ellen - I'm sorry.

Amanda takes hold of her sister's body.

AMANDA

I've met this girl. She's a very
troubled person, and I think I
might be able to help her.

She hugs her tighter.

The women gather around her.

AMANDA

She's been so neglected.

The women surround the body. Kind and lovely women.

AMANDA

I don't now if this is real or not
but I want you both to be at
peace.

Amanda's crying turns to sobbing --

One of the women sheds a tear.

Another woman bows her head.

AMANDA

I have a chance to make things
right here.

The third woman begins wailing.

The first woman joins but in a different tone.

The second joins them in yet a different tone. Together
the three form a harmony of wailing that has a beautiful
musical quality.

The three women stand, hands joined around Amanda and her
sister, and honour them with their harmonic wails.

Amanda sits in front of the grave. She is staring at a
grave stone which has a name - 'DEVLIN'.

She wipes it off, pulling herself to her feet.

148 EXT. ISLAND - DAWN 148
Dawn light is visible over the fog covered island. The fires from the culling still burn.

149 EXT. VILLAGE - CONTINUOUS 149
Islanders watch as a red and orange haze blankets the far off corners of the island.

150 INT. THE TAVERN - CONTINUOUS 150
Gerard watches from the window. The red haze reflects on the glass.
He takes his heavy coat and hat and leaves the tavern.

151 EXT. ABANDONED MINING VILLAGE - LATER 151
An old settlement, now crumbling. Stone walls where the miners used to reside. Abandoned for over a century.
Amanda passes through the eery and silent grounds.
Leading to the --

152 EXT. COAST - LATER 152
Amanda scans the coastline --
In the distance, Danny can be seen scrambling across the exposed bed to the smaller island nearby. The same place Amanda photographed at the beginning of her trip.
Amanda pursues.

153 EXT. SHORE - LATER 153
Amanda is crossing the treacherous no-man's-land where ocean and land battle for control.
The incoming tide threatens her crossing.
The patterns on the rocks cause her to stop momentarily, but she shakes the flashes of horror and continues on.
She eyes a cave ahead.

(CONTINUED)

153 CONTINUED:

153

A wave crashes over her and she slips. Hits the rocks hard. Her PHONE slips from her pocket and it washes away.

Amanda reaches out but it is too late.

She pulls herself to her feet again and puts one step in front of another.

154 INT. BURIAL CAVE - MOMENTS LATER

154

Amanda enters the cave to find Danny tearing the place apart.

TWO DOZEN PARTIALLY BURIED SKELETONS litter the cave. Danny is digging up sand with his hands.

AMANDA

You don't even know what you're looking for, do you?

Danny turns around in surprise to find Amanda standing, soaked and exhausted, at the entrance of the cave.

AMANDA

Where is she?

DANNY

Half way to the mainland by now.

Amanda looks to the ocean and imagines Branna's fate.

Amanda charges at Danny as a wave crashes into the cave.

The combined force of Amanda and the wave knocks him to the ground. The water covers his face momentarily.

She holds him down but the water eventually runs back out to sea.

Danny overpowers Amanda and kicks her off.

He hits Amanda, knocking her down, and he stands over her, pushing her into the water as it returns inwards filling the cave.

Amanda struggles under the water - Danny loses no strength in pressing her face under the surface.

Amanda's vision fades and the life leaves her.

Danny stands up and starts collecting the remnants of the skeletons - old necklaces and handmade jewellery.

(CONTINUED)

154 CONTINUED:

154

The water leaves the cave again.

Amanda begins to wake --

Turns herself over --

Pulls herself to her feet --

Danny turns around and is suddenly blasted with a heavy piece of rock.

Amanda drops the rock on the ground as Danny loses blood on the sand. Water rolls in and the red fades.

Danny coughs as he swallows the water.

Amanda approaches him, standing tall and fierce like a fiery warrior. Eyes piercing --

He clutches the relics --

Amanda looks at him with pity.

AMANDA

You can keep them.

Amanda protects herself from another crashing wave.

She looks back to Danny, who is now unconscious.

She looks to the skeletal remains one last time. The water is filling the cave.

155 EXT. SHORE - MOMENTS LATER

155

Amanda steps out into the raging storm.

It is raining again. It cleanses her face. Rain hides her tears. She looks wide eyed at the horror of the glowing island.

The tide has come in and the water level is high. Amanda swims.

156 INT. DARRAGH'S HOUSE - CONTINUOUS

156

Darragh is with his FAMILY when the door crashes open and REBEL ISLANDERS storm the house and capture Darragh.

His WIFE screams as she watches her husband being dragged away.

157 EXT. SHORE - CONTINUOUS 157

Amanda swims back to the main body of the island. It is a perilous journey in the storm.

158 EXT. MAURICE O' KEEFE'S HOME - CONTINUOUS 158

Darragh is dragged to the burning house - the light from the flames lights up his face and it reveals true fear.

All around him are locals who are loyal to Gerard being shoved or beaten.

Darragh picks out his brother, Paul, among the group - taken off guard as a pale of gasoline is tossed on him. And then a crudely made MOLOTOV transforms him into a ball of flames.

Darragh watches, speechless and in horror as his brother is kicked into the burning homestead.

Then he is moved forward. His turn.

159 INT. CLAIRE'S BEDROOM - CONTINUOUS 159

Deirdre enters the room to find her daughter lying in bed, awake, but reserved.

Claire's mouth is bandaged heavily and she breathes through her nose.

Deirdre looks outside at the madness --

And then closes the curtains.

Claire is puzzled and groans --

DEIRDRE O' KEEFE
It's okay my dear.

Deirdre presses her hand on Claire's forehead and before Claire can react, she uses her other hand to form a seal over Claire's nose.

Claire struggles desperately, groaning to the point where she bleeds again from her mouth. White bandages turning red.

DEIRDRE O' KEEFE
I won't let them take you.

(CONTINUED)

159 CONTINUED:

159

Nothing Claire can do is enough --

Tears are forced from her eyes as all is lost --

Suddenly, the door bursts open and a crowd enters to take Deirdre.

Claire takes a deep breath and groans as loud as her throat will allow her.

160 EXT. ISLAND - CONTINUOUS

160

Amanda traverses rocks and debris to the --

161 EXT. BLACKCROSS HARBOUR - LATER

161

Amanda arrives at the harbour by way of the rocky shoreline.

She spots Gerard emerging from the violent sea, soaked to his skin. He is out of breath from having waded so far out.

Amanda slows and tries to understand why he was in the water. His expressions is one of remorse and confusion. A man trying to understand his actions.

AMANDA

Your son is dead.

GERARD O' KEEFE

The water will absolve him.

Amanda looks out to the water where he has just emerged from.

AMANDA

Branna!

She pushes against the crashing waves and into the sea.

THE LIGHT OF A BOAT in the distance - it lets out a FOGHORN BLAST. *The Nicholisa*.

Branna looks to the light, blinding. Waves explode around her.

162 INT. THE NICOLISA - CONTINUOUS

162

The Priest is driving the boat. He sounds the horn again.

(CONTINUED)

162 CONTINUED:

162

Notices the gathering on the shore and is puzzled.

He can see Gerard being engulfed by the violent mob.
Gerard's fate is sealed.

163 EXT. BLACKCROSS HARBOUR - CONTINUOUS

163

Amanda is struggling to find Branna.

Underwater she can see nothing.

On the surface she can see WOMEN DROWNING AND FIGHTING
AGAINST THE CURRENT. THE WOMEN ARE FROM THE 1600s.

Amanda pushes through them -- crashing waves send her
underwater again.

She catches a glimpse of Branna --

Emerging again, the women are gone and Amanda goes to
Branna in the darkness.

Branna is drowning. The most painful sensation.

Amanda catches Branna and the boat's searchlight finds
them.

164 EXT. THE NICOLISA - CONTINUOUS

164

The priest looks into the water for signs of Amanda or
Branna.

Their chances of survival grow smaller by the second.

Then Amanda kicks powerfully and emerges from the water --

Pulling Branna to the surface.

The priest grabs her arm and pulls her towards the boat.

Amanda sees the Priest and is puzzled and relieved all at
once.

PRIEST
I've been listening.

He pulls them aboard to safety.

165 MOMENTS LATER

165

Islanders board the boat, their lives on their backs.
Men, women and children.

Branna is spread out on the deck as Amanda gives CPR.

Karen watches with her son.

The boy with the shaved head watches, as do the other
victims of the island. Victims just like Branna. They
watch helplessly.

The Priest is speaking urgently on the radio.

Amanda loses hope. She leans back, unable to help any
more. Crying.

She looks at the island as it grows more distant. Glowing
red in-between the clouds.

On the shore of the cove, THE THREE MYSTERIOUS WOMEN,
illuminated by lanterns and wailing for Branna.

And then suddenly Branna coughs.

Amanda helps the child to catch her breath again...

And then the relative safety of the Atlantic as it puts
distance between them and the island.

166 EXT. CONNEMARA COAST - LATER

166

Buses waiting. Police and Ambulances.

Flashing emergency lights.

The priest is helping to dispense bottled water to the
escapees.

Amanda follows Branna as she is escorted onto the
ambulance in a trolley.

Amanda catches Karen and her son as they board a bus with
the other DISPLACED REFUGEES. The teacher nods
approvingly to Amanda.

167 INT. ISLAND - NIGHT

167

The fields are lit up in flames, fuelled by the poison in
the ground.

(CONTINUED)

167 CONTINUED:

167

The livestock are trapped and burn alive, despite the remaining islanders' attempt to put out the fires.

Hell reclaims the island.

168 INT. HOSPITAL ROOM - SOME TIME LATER

168

Branna is sleeping in the bed. Her situation is still serious.

Amanda is in a chair next to her, working on her laptop. A well earned rest. Time has served Amanda well. She looks like a different person now. Healthier and happier.

ONE THE SCREEN: The slides for the same presentation she made at the beginning. This time the powerpoint has been updated to reflect the whereabouts of the burial site.

Amanda stares at the slide with the information. She deletes it.

In the corridor, Professor McCabe argues with a POLICE OFFICER and tries to prevent the officer from entering the room.

Branna wakes. She turns to Amanda and is surprised to see her keeping a vigilant watch over her.

Amanda sees that Branna is awake.

She smiles.

169 INT. BOOKSHOP - SOME TIME LATER

169

Amanda approaches the checkout with a book in hand.

She hands the book to the SALES ASSISTANT --

A SPEECH THERAPY BOOK FOR CHILDREN.

170 EXT. BOOKSHOP - MOMENTS LATER

170

Amanda leaves the checkout with the carrier bag.

She notices a CATHEDRAL across the street, with a CONGREGATION entering.

171 INT. CATHEDRAL - MOMENTS LATER

171

Amanda enters the cathedral and finds a mass underway.

She sits at the farthest seat from the alter and looks about as though trying to ensure that she fits in. It has been a while, clearly.

The service is like a song on mute in the background. It is ever present but isn't getting her attention. She is unsure of herself.

A PARISHIONER taps her on the shoulder - it startles her.

A warm and friendly face, offering a prayer book.

Amanda accepts it out of politeness.

DUBLIN PRIEST

Now we take this time to tell God
our sins, in the hope that he will
forgive them.

People reach inside of themselves. Amanda is anxious at the challenge.

Overwhelmed and showing signs of deep sorrow. Like an acknowledgement of a wound that can finally begin to heal. She won't let it come to the surface though.

Her eyes betray her.

END.

Appendix F:
***Be Tradition* Shooting Script**

Be Tradition
by
Michela Cortese

Michela Cortese Productions

michela.delavega@gmail.com

EXT - COUNCIL ESTATE - MORNING

PART 1.

FRONTAL FULL SHOT:

A sunny August morning in Italy. The 70s.

A CHILD is walking in the middle of the road while bouncing and juggling with a football. He looks bored and it is very hot outside.

LONG SHOT:

The child keeps walking and bouncing his basketball under a big block of buildings and stops for a second to look at a bicycle which was left by somebody against the wall. These are council estates with big balconies following one another and a sequence of columns at the ground floor, where the child is standing.

FULL SHOT (TBC):

The child walks towards the main door of the building with the football in his hand.

EXTREME CLOSE UP SHOT:

The child's finger presses the intercom button for one of the flats.

BACK OF THE CHILD - MEDIUM SHOT:

The child leans his head towards the intercom and nods his head.

FRONTAL FULL SHOT:

The child emerges from a small back garden with some TOMATOES in hand.

SIDE FULL SHOT:

The child is standing under a series of balconies and windows and a BASKET ON A ROPE is slowly lowered to his level.

AMERICAN SHOT:

The child gently puts the tomatoes in the basket. The basket slowly ascends and the child follows it up to the --

INT - OLD KITCHEN - DAY TIME

SIDE AND FRONTAL FULL SHOT (TBC):

A typical Italian kitchen.

The child is at the table, sitting with his knees on a chair. He is eating from a LITTLE TERRACOTTA BOWL.

A sixty year old woman, his GRANDMOTHER, is standing next to him behind the table and making PIZZA DOUGH from a WHITE CERAMIC BOWL.

The child moves away the bowl as he doesn't want to eat anymore and he starts starrng at the pizza dough that his grandmother is working.

Near the table there several old-style pieces of furniture with OLD FRAMES AND PICTURES and a seventies RADIO. There is also a plant of basil.

The table is covered in flour and there is also plate with tomatoes and other key ingredients for making pizza.

OVER THE SHOULDER SHOT (TBC):

The grandmother realises he is starrng at her and she give him a piece of the dough. The kid is now happy to be playing with the dough and puts a lot of flour on his hands to let it fall onto the dough.

END OF PART 1.

EXT - COUNCIL ESTATE - AFTERNOON

PART 2.

A sunny afternoon. The 80s.

FRONTAL FULL SHOT:

A MAN (20s) is riding a VESPA in the middle of the road. He is wearing Rayban-style sunglasses and a shirt.

LONG SHOT:

The guy arrives under a big block of buildings and he gets off his Vespa. It is the same council apartment building we see in part 1.

FULL SHOT (TBC):

The man brings his Vespa towards at the entrance of the building and parks it on the side of a wall, in front of the main door of the building.

EXTREME CLOSE UP SHOT:

The man's finger presses the intercom button for one of the apartments.

BACK OF THE GUY - AMERICAN SHOT:

The man leans his head towards the intercom and nods his head. He is holding his helmet on his side, under his arm.

WIDE SHOT:

The guy walks towards the back of the building. We can still see the Vespa on the side on the wall.

INT - OLD KITCHEN - DAY

MEDIUM WIDE SHOT:

The same typical Italian kitchen.

The man is standing up behind the table and he is comfortably rolling out a pizza dough. On the table there are all the main ingredients and a WHITE CERAMIC BOWL with TOMATOES inside. There is also the LITTLE TERRACOTTA BOWL with flour inside.

The grandmother is sitting next to her grandson, wearing glasses and reading a book. She is older now.

She sneakily looks at him over the book to check out what he is doing. She looks proud of her grandson.

Near the table, there are several old-style pieces of furniture with OLD FRAMES AND PICTURES, a COLOUR TV.

At the back of the characters, two windows are open. On one of the windows there is a BASKET WITH A ROPE. We can also see a small kitchen unit from an angle (it is another little room).

CLOSE UP OF THE TABLE - CLOSE UP ON HANDS AND A TRAY:

The man is fixing some fresh tomatoes on a pizza with basil leaves and mozzarella cheese. The pizza is on a tray.

FULL SHOT:

He puts the tray into the oven and closes it.

CLOSE UP SHOT OF HIS HANDS:

He sets a small, funny-looking, mechanic COOKING TIMER that has the SHAPE OF A LITTLE FAT 'CHEF'.

END OF PART 2.

EXT - FIELD OF VEGETABLES - PRESENT DAY

PART 3.

LONG SHOT:

AN OLDER MAN (55) is walking through a sequence of tomatoes plants, picking the tomatoes slowly. The man is wearing a chef uniform.

CLOSE UP:

He puts the tomatoes in A BASKET. The basket already contains other vegetables.

AMERICAN SHOT:

The man keeps walking through the fields.

INT - MODERN KITCHEN - SUNSET TIME

CLOSE UP:

Two hands are holding a wooden sieve and the FLOUR is slowly coming down from it like dust. The sunset light comes through the flour from a side big window, making the flour look like snow.

MEDIUM SHOT FROM THE TOP:

Two hands are professionally chopping some vegetables. The table is full of ingredients and tools. In particular, we can see the LITTLE TERRACOTTA BOWL that he used to eat from. The terracotta bowl is cover with a bit of flour inside but it is empty.

FULL SHOT:

The shot reveals the man behind a table in a white kitchen. There are hobs and an oven at his back. The kitchen is fully equipped. It is the kitchen of a professional chef. On the counter there is the same WHITE CERAMIC BOWL with lemons

inside.

On a side piece of furniture there is also a modern TV and a frame with a black and white pic of him as a child.

Next to the photograph is the 'little chef' cooking timer. The timer is moving.

MEDIUM SHOT:

The man very gently washes the little terracotta bowl in the sink and dries it very carefully with a tea-towel.

We suddenly hear the the cooking timer ringing.

FULL SHOT:

The man opens the oven behind him and and takes out a PIZZA. It is the same type of pizza that he put in the oven when he was young.

He holds the tray and with a quick movement he lets the pizza slide onto a big white plate that was already placed on the hobs.

CLOSING SHOT - MEDIUM SHOT:

He picks the plate up and smells the pizza with a subtle smile.

Behind him the light of the sunset highlights his figure and the kitchen around him as the day comes to an end.

END.

Appendix G:
***The Dead Cry Out* Pitch Bible**

THE DEAD CRY OUT

PRODUCTION NOTES

A mystery thriller feature film

Running Time: 100 mins approx.

Draft 5 23/08/18

John.finnegan247@gmail.com

Michela.Cortese@falmouth.ac.uk

THE DEAD CRY OUT PRODUCTION NOTES

Premise:	3
Synopsis:	4
Writer's Statement:	5
The Island of Blackcross:	7
The Legend of the Wailing Woman (Banshee):	8
Character Bios:	9
Treatment:	11
Main Cast	17
Second leads	18
About the Filmmakers	19
Credits	21

Premise:

Doctoral student, Amanda Devlin, visits a remote Irish island in search of her estranged brother-in-law, only to discover that the God-fearing community may be behind his disappearance in order to protect a dark secret about their home. The Islanders turn against Amanda, who must solve the mystery and escape the island.

Link to pitch trailer: <https://www.youtube.com/watch?v=WXnnLcg8YfQ>



Figure 1. Grace O' Malley, the pirate queen who conquered a man's world.

Synopsis:

Amanda, an American historian living in Ireland, is tasked with travelling to an isolated and reclusive island, Blackcross, to find her missing brother-in-law, Nick, who disappeared while searching for a 500-year-old burial site.

On the bleak island, Amanda meets outsider Danny, who is investigating the mysterious deaths of livestock. They set out to find Nick, only to meet the anger of the islanders who resent their presence. Meanwhile, Amanda realises she is being followed by a teenage girl, Branna, who seems to be leaving clues for her. Livestock and islanders continue to disappear, and the islanders blame Branna, whom they believe to be embodying a centuries-old Banshee threat which haunts the island.

Amanda is haunted by dreams of her sister who recently drowned. As more people on the island disappear, the leader of the community, Gerard O' Keefe, rallies the island against Branna. Amanda follows Branna's clues and realises she is not dangerous, and Amanda protects her from the towns people. Amanda learns that Branna is a misunderstood outcast and that Gerard is using her to perpetuate old ideologies to keep the island in check.

The Islanders descend on Branna's father's farm and burn it in retaliation while Amanda realises that Danny is actually one of the islanders. He explains that he used the identity of a missing investigator to get close to Amanda and find the site. He attacks Amanda, but she escapes. In an exhausted state, she makes peace with her deceased sister.

Later, Amanda tracks Danny to the burial site which Nick was search for. Injured, he is left to the incoming tide and Amanda flees in search of Branna. Amanda then confronts Gerard O' Keefe, saves Branna and escapes the island.

In Dublin, Branna settles into her new life with Amanda, and Amanda conceals the location of the burial site from her peers.

Writer's Statement:

The Dead Cry Out is an investigative thriller with elements of the murder mystery and personal drama genres. However, as with all great mysteries, *The Dead Cry Out* will be more than just a story of investigation, adventure, and survival. *The Dead Cry Out* is a narrative about climate change told through a story of women's oppression in Irish history. Women are, in this case, the personification of the environment: women's abuse and oppression in history are the representation of society's exploitation of the Earth. 'Nature' is often associated with the female sex, starting with the most basic concept of 'mother nature' and, throughout the film, several metaphors will be established between the two concepts.

It echoes the narrative strategies used in *Take Shelter*, which uses natural disasters to explore mental health, *Get Out*, a horror film which indirectly deals with issues such as slavery and racism and *Interstellar*, a film which never mentions climate change but nevertheless is heavily associated with the subject.

In our case, the protagonist's quest is also set in a particular environment, where land exploitation, the side effects of mining, and the harsh weather conditions represent a chance to explore other central debates related to environmental risks. These aspects will make *The Dead Cry Out* a horror film that not only entertains but also educates and challenges the audience through a well-balanced mix of fictional and factual elements. It shows how societal mistakes of the past can come back to haunt us in the present and how we are often in denial (or decide to be dismissive) of the risks and atrocities going on in our society. The reason for refusing the truth, as the film will show through the characters' journey, is due to our need for survival and the islanders' fears of becoming climate refugees.

Thematically, *The Dead Cry Out* is nothing less than a desire for justice. This is evident in all aspects of the story. At a broad level, the Wailing Women seek justice for the murder of

their people and Amanda seeks to right the wrongs of history by finding an ancient burial site and revealing the bravery and the character of the women who died on the island. Branna seeks revenge for being shunned by the islanders and, at a personal level, Amanda subconsciously seeks atonement for failing to protect her own sister. Amanda proves her worthiness by abandoning the site to the sea and concealing its location from her peers, a plot point which is rare in many films of this nature.

Environmental exploitation and violence of women are longstanding issues that span centuries, but it is only recently, in historical terms, that society has opened and accepted a conversation regarding these two topics. Ireland is steeped in mythic stories of rebellion and an island still recovering from the plantations provides a perfect backdrop for these important issues.

Welcome to Blackcross.

The Island of Blackcross:

For centuries people believed that there was an island far out in the Atlantic called Hy Brasil. It could occasionally be seen from the Connemara coast and even appeared in medieval seafaring charts. The last recorded sighting was in 1872.

The island of Blackcross has been heavily linked to the legend of the enchanted island. It is a small island and situated far into the Atlantic. The great distance makes the island incredibly difficult to see from the mainland, and few have travelled there. The isolation of Blackcross from the rest of the country has contributed to many myths and legends about the island over the centuries.

One such legend recounts how in 1575, Sir Francis Drake led a series of raids on the Irish coast at the beginning of the English plantation of Ireland while attempting to quell a growing rebellion. One such raid took place in Connaught, where Drake was searching for the pirate queen, Grace O' Malley. Drake rounded up 24 women, sympathisers of O' Malley, and marched them into the water until they gave up her location. They drowned before submitting to the invaders. Days later, their bodies washed ashore and were buried by three sisters. To this day, the location of the burial site remains a mystery. Since then, explorers have tried to find the site, but with no success.

"Be it real and firm land, kept hidden by God, as the earthly paradise, or else some illusion by airy clouds appearing on the surface of the sea, or the craft of evil spirits" - Roderick O' Flaherty.

The island has a population of approximately 150 people, but was once a haven for piracy, 7th century monks, Cromwellian lookouts and in the 1800s, an American mining operation. Today, the island is devoid of activity. The inhabitants live off the land and, for the most part, are self-sustainable. Most know little of life outside of this island, and few ever leave. A place where old beliefs die hard.

The Legend of the Wailing Woman (Banshee):

Irish legend speaks of a lament being sung by a woman; she would sing it when a family member died or was about to die, even if the person had died far away and news of their death had not yet come, so that the wailing was the first warning the household had of the death.

She also predicts death. If someone is about to enter a situation where it is unlikely they will come out of alive she will warn people by screaming or wailing. When several wailing women appear at once, it indicates the death of someone great or holy.

Production note: The word 'banshee' should not be used when describing the wailing women in the film, due to negative connotations in popular culture. It is used here as a basis for the idea.

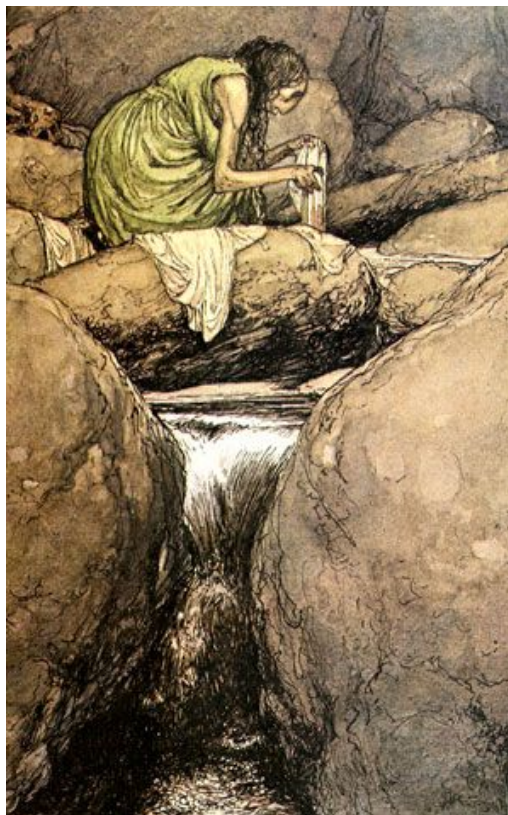


Figure 2. Early illustrations of wailing women or 'banshee'

Character Bios:

AMANDA DEVLIN -- American born PhD student, bright and uncompromising. She researches about the English plantations of Ireland. Idealistic but not naïve. Amanda is pushy and sometimes rude. Sometimes disrespected but always worthy of respect. Exhausted but determined to help others. She is the hero of the piece.

BRANNA O' KEEFE -- A teenager and an outcast on the island of Blackcross. She has been mistreated her entire life and left to the wild. She is animalistic in nature, does not speak and is considered an abomination by the other islanders. She believes the stories they say about her, that she is cursed and a punishment for the crimes of their past.

DANNY -- Early 30s. An investigator sent to solve the mysterious deaths of the island's livestock. He is very clever and possesses a charm that makes the overall trip to the island tolerable for Amanda. He knows much about the island, more than an outsider should.

GERARD O' KEEFE -- 60s and weathered. His bloodline dates back to the first settlers on the island and believes this land is his birth right. He is quick to temper but masks his feelings well. The islanders fear him, despite never leaving his tavern. Branna's uncle.



Figure 3. Cromwellian propaganda about Irish rebels.

Treatment:

AMANDA DEVLIN (30s), an American born PhD student, delivers a lecture about the massacre of Blackcross to undergraduate students at a Dublin university.

Afterwards, Amanda is approached by a professor, JOHN McCABE, who sheds light on the disappearance of Amanda's brother-in-law and their colleague, NICK. McCabe explains that Nick went to Blackcross to find *mythic burial site of the massacre*. Now he has gone missing on the island and McCabe asks Amanda to go and find him.

In Connemara, Amanda finds a PRIEST who reluctantly takes her to the island by boat. On the island, Amanda finds the owner of a nearby tavern, GERARD O' KEEFE, who takes her in and gives her a room. She is introduced to his wife, DEIRDRE and daughter CLAIRE. They bring her to Nick's room when he stayed there and explains that he has since left to explore the rest of the island. A picture on the wall called *The Wailing Women* catches Amanda's attention and that night she is woken to the sound of wailing. She sees a young woman, BRANNA, in a nearby field crying.

The next morning, Amanda decides to investigate the nearby fort, Nick's last known location. She is advised against it but goes anyway. On the way, Amanda is joined by DANNY, an engineer from the mainland who has come to investigate the toxic element on the island that is killing the livestock. On the way, Amanda goes to the shore where the mysterious women were the night before. There she sees an opening in a cave. Danny calls her away and they investigate the fort.

The fort is blocked off on account of the storm and Amanda is chased away by one of the islanders who doesn't take kindly to trespassing outsiders.

Danny brings Amanda to the local school which doubles as a records hall. Amanda finds old documents relating to a mining company in the 1800s, which came and corrupted the land in search of quartz. A teacher in the school, KAREN, offers help and gives

insight into Nick's activities. He had become obsessed with finding the burial site. Later, Amanda is returning to the tavern when she finds a couple mourning over the loss of their livestock.

The O' Keefe's discuss the incident at the farm and Amanda's progress in attempting to find Nick. That night, Amanda returns to her room from taking a shower and finds that her phone has been stolen. Claire suggests that Branna might have been responsible and Amanda demands to know more about the girl. Deirdre describes Branna as violent and "touched". She spends the night in Nick's room instead.

Amanda lies in bed reading the old material from the records hall when she hears another scream outside. She goes to investigate and finds Branna bathed in moonlight and soaked in blood. Outside, Gerard's dog is missing. The next morning, Amanda goes through more of Nick's notes on the artefact, hoping to piece together a trail of some sort. She finds a letter from Nick, addressed to her. However, before she can open it, she is distracted by an intruder and when she returns to the room, the letter is gone.

Later in the day, the islanders gather at the church in order to address Branna and the issue with the livestock. Arguments break out. Danny watches from the back of the church and leaves. Amanda and Karen stand outside and have a discussion about the island when panic breaks out. A dead sheep falls from the rafters, suspended by a hangman's noose. A prank by local teenagers.

Amanda returns to the tavern and finds Gerard mourning over his dog, discovered by Darragh. Gerard drinks his sorrows away and in his drunken state, he implies that he had an argument with Nick at the fort on the night he disappeared. Amanda realises that Nick might still be at the fort and she enlists Claire's help. Claire admits to stealing Amanda's phone, returns it and the two set out to the fort. Near an abandoned mine shaft,

Claire and Amanda are separated. Amanda, fearing for her safety, takes refuge in the shaft and follows it until she finds herself inside the fort. There she encounters Branna momentarily, before seeing MYSTERIOUS WOMEN in the water. She goes down to the water and is sucked in by the current. As the water takes hold of her, she dreams of rescuing her sister from a lake some time before. Then she is brought back to reality and to the shore by Danny. She is carrying Nick's rucksack, plucked from the water. She accepts that Nick is dead. Danny explains that he too suffered similar loss and gives her support in the moment.

Meanwhile, on the other side of the island, Claire is found by a local with a gossip's bridle clasped to her head, her tongue pierced and bleeding profusely.

Hostilities on the island reach a head as word about Claire's attack spreads. Patience for Amanda and her search has also waned, and they demand she leave. Amanda goes to Claire at the tavern and finds that she has lost her tongue in the attack. Amanda is horrified and goes to Nick's bedroom. The villagers start hounding Amanda and she is forced to flee the tavern and escape into the heart of the island.

There, she encounters MAURICE, brother of Gerard and father of Branna. He takes her in and it becomes clear that Branna's animalistic nature is a result of Maurice's extreme beliefs. He explains the history of the island. He explains that the islanders drowned two dozen pagan women, centuries ago. Three sisters, known as Wailing Women, collected the bodies and buried them away from the islanders. Amanda believes the women she has seen are these wailing women. Meanwhile, the islanders track Amanda to the house and Maurice tasks her with finding Branna at the fort to protect her. The islanders capture Maurice.

Amanda finds Branna at the fort and together they witness one of the locals burying Nick's body in a nearby grave. Branna takes Amanda into a crypt where she has been hiding. Amanda communicates with Branna using drawings on the wall of the crypt

and learns about the suffering Branna has faced at the hands of her father and the other islanders. The islanders, under orders from Gerard, kill Maurice as a way to get to Branna. Amanda helps Branna escape through the mine shaft before they are caught, but not before they witness her family home burned to the ground.

At Karen's cottage, Amanda and Branna formulate a plan to escape the island. Amanda and Branna go to the school to find a two-way radio. While trying to make contact with the mainland, she realises that Danny isn't who he says he is and has been working against her all along. A picture in the school reveals that Danny used to be a student long ago and states that his real name is O' Keefe. Danny confronts Amanda and explains that they had been using her to finish Nick's work which was cut short prematurely by Gerard when he murdered him. They hoped that Amanda would lead them to the burial site, so they could destroy it and prevent further explorers from threatening their way of life. The two escape and Danny pursues them across the island until Amanda is separated from Branna.

Amanda takes shelter near an abandoned graveyard. There, she passes out and dreams of her sister drowning in a lake, Amanda and Nick powerless to help. As she sits with her sister's body, three wailing women, the same mysterious women as before, surround them and perform their harmonic ritual to mourn her and to bring closure. Amanda wakes again, stronger than before and with renewed purpose.

Amanda chases Danny to the cave on the shore, where she first saw the mysterious women. In the cave, Danny has found the burial site. She demands to know where Branna is, and Danny confesses to killing Branna. In her anger, Amanda attacks Danny and is helped by the incoming tide. Violent waves flood the cave and Danny drowns. Amanda escapes and finds Gerard on the shore. He has attempted to kill Branna by drowning her in the water. He is shaken by the events, unsure of his own abilities. Amanda

wastes little time in wading into the water to rescue Branna. The Priest's boat arrives in time, having heard the distress call from the radio, and pulls Amanda and Branna onboard. Some of the other islanders, including Karen, climb aboard and the Priest takes them to safety. Meanwhile, hostilities on the island see an unpleasant end for Gerard and Deirdre who are consumed in the fires of the island.

In the weeks and months later, Amanda and Branna settle into their life together in Dublin. Amanda tries to teach Branna to speak and Amanda makes peace with her own demons. The location of the burial site is never revealed.



Figure 4. Conceptual poster.

Main Cast

Amanda Devlin



Danny



John McCabe



Branna O' Keefe



Gerard O' Keefe



Maurice O'Keefe



Second leads

Priest



Claire O 'Keefe



Karen



Boy



The Wailing Women



About the Filmmakers

Oisín Mac Coille (Director/Producer) has been directing films and music videos for over ten years. He studied T.V and Film Production in his native Cork City before embarking on a successful career directing for film and television. His work has been broadcast at home and abroad and has been shown in film festivals, both nationally and internationally. In 2013 he was nominated for 'best music video' for *Shakier* at the DareMedia Underground Short Film Festival, and his short film, *Still Life*, won the 'Best National Short' award at the Underground Film Festival in 2016. Oisín is currently directing for Tg4's flagship series *Ros Na Run*. Oisín is a native Irish speaker and promotes the language in his work.

John Finnegan (Screenwriter/Producer) has worked in the film industry for over fourteen years. He started his career as an assistant director, before moving into post production, where he became the head of post-production for a leading European production house. He left to form Bridge House Films in 2010, and began writing and producing short films, including *Still Life* in 2015 alongside Oisín Mac Coille. John has an MA in Screenwriting from Bournemouth University, a PhD in Screenwriting from Bangor University and runs the MA Writing for Script and Screen programme at Falmouth University. He is a member of the executive council of the Screenwriting Research Network and sits on the board of the Cornwall Film Festival.

Michela Cortese (Screenwriter/Producer) has worked as a visual communication expert for several years and has advised as a media consultant on matters relating to the environment, in particular, climate change and energy conservation. She is a PhD candidate at Bangor University and associate lecturer in Screenwriting at Falmouth University, as well as an expert in risk communication and environmental communication. She is also a member and advisor for the Media and Persuasive Communication

Network at Bangor University. Her research focuses on the visual communication of climate change through films and television programmes from a sociological perspective. She is currently the co-leader and producer of *Visually Capturing CO2*, a series of projects that involves the production of environmental visual representations in collaboration with Dr. Enrico Andreoli, senior lecturer in the department of engineering at Swansea University. Her recent paper on the role of films in environmental communication was published as a chapter in the first "*Handbook of Climate Change Communication*" by Springer in September 2017.

Credits

Story by

Michela Cortese, John Finnegan and Oisín Mac Coille

Screenplay by

Michela Cortese and John Finnegan

Directed by

Oisín Mac Coille

Appendix H:
Signed Consent Forms



Bangor University's 'Code of Practice for the Assurance of Academic
Quality and Standards of Research Programmes' (Code 03)
<https://www.bangor.ac.uk/ar/main/regulations/home.htm>

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Researcher's name: Michela Cortese, PhD student

Participant's name: Enrico Andreoli, PhD

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered.

I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected (if wish to remain anonymous).

I agree to having the interview/discussion recorded.

I agree for the information generated in the interview to be used as part of Mrs Cortese's doctoral research and thesis.

Signature of participant:

Date: 20/6/2019

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.



Bangor University's 'Code of Practice for the Assurance of Academic
Quality and Standards of Research Programmes' (Code 03)
<https://www.bangor.ac.uk/ar/main/regulations/home.htm>

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Researcher's name: Mrs. Michela Cortese, PhD student

Participant's name: Prof. Kip Thorne

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered.

I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected (if wish to remain anonymous).

I agree to having the interview/discussion recorded.

I agree for the information generated in the interview to be used as part of Mrs. Cortese's doctorate research and thesis.

Signature of participant:

Date: 2/21/18 .

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.



Bangor University's 'Code of Practice for the Assurance of Academic
Quality and Standards of Research Programmes' (Code 03)
<https://www.bangor.ac.uk/ar/main/regulations/home.htm>

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Researcher's name: Michela Cortese, PhD student

Participant's name: Dr John Finnegan

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered.

I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected (if wish to remain anonymous).

I agree to having the interview/discussion recorded.

I agree for the information generated in the interview to be used as part of Mrs Cortese's doctoral research and thesis.

Signature of participant:

Date: 20th June, 2019

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.



Bangor University's 'Code of Practice for the Assurance of Academic
Quality and Standards of Research Programmes' (Code 03)
<https://www.bangor.ac.uk/ar/main/regulations/home.htm>

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Researcher's name: Michela Cortese, PhD student

Participant's name: Oisín Mac Coille

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered.

I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected (if wish to remain anonymous).

I agree to having the interview/discussion recorded.

I agree for the information generated in the interview to be used as part of Mrs Cortese's doctoral research and thesis.

Signature of participant: *Oisín Mac Coille*

Date: 28/06/19

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.



Bangor University's 'Code of Practice for the Assurance of Academic
Quality and Standards of Research Programmes' (Code 03)
<https://www.bangor.ac.uk/ar/main/regulations/home.htm>

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Researcher's name: Michela Cortese, PhD student

Participant's name: Dr Lynda Yorke

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered.

I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected (if wish to remain anonymous).

I agree to having the interview/discussion recorded.

I agree for the information generated in the interview to be used as part of Mrs Cortese's doctoral research and thesis.

Signature of participant: 

Date: 20.06.19.

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.



Bangor University's 'Code of Practice for the Assurance of Academic
Quality and Standards of Research Programmes' (Code 03)
<https://www.bangor.ac.uk/ar/main/regulations/home.htm>

COLLEGE OF ARTS & HUMANITIES

Participant Consent Form

Researcher's name: Michela Cortese, PhD student

Participant's name: Philip Parker

The researcher named above has briefed me to my satisfaction on the research for which I have volunteered.

I understand that I have the right to withdraw from the research at any point. I also understand that my rights to anonymity and confidentiality will be respected (if wish to remain anonymous).

I agree to having the interview/discussion recorded.

I agree for the information generated in the interview to be used as part of Mrs Cortese's doctoral research and thesis.

Signature of participant:

Date: 4 July 2019

This form will be produced in duplicate. One copy should be retained by the participant and the other by the researcher.