TIME, RHYTHM and MAGIC
Developing a Communications Theory Approach to Documentary Film Editing

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ABSTRACT

*Time, Rhythm and Magic: developing a Communications Theory approach to Documentary Film Editing* is principally concerned with the editing of documentary films, in particular the historical documentary. The essence of the study draws upon a reflective experiential analysis of the author’s extensive creative practice in documentary film production, with particular reference to the principles and techniques the author employs in documentary editing. The research argues that the process of constructing certain forms of documentary film involves the selection of small segments, or *samples*, taken from a whole and re-assembled into a reductive re-presentation of that whole. The author finds that useful analogies can be drawn between this process in documentary film editing and the process of sampling, encoding and re-construction inherent in digital telecommunication systems.

The study also argues that a central component of both processes is the sharing and manipulation of temporal elements, and that although these manipulations are a crucial determinant of the cohesion and flow of a finished documentary film, they are invisible to the viewer. The documentary film editor is thus able to create convincing illusions which the audience perceives as reality—a creative process which might thus be described as a form of ‘magic’.

The author further describes his editing methodology as an iterative process involving a complex combination of cognitive, emotional and organic responses; responses which he believes are shared by other editors and which may be characterised as a unique ‘phenomenology of the edit suite’. This proposition is supported with both qualitative and quantitative argument and interviews with other film editors.

The study references much experiential data from the author’s professional practice, extracts from relevant literature incorporated into the written work, and four original examples of documentary film studio works, which are informed by and contributory to the analytical research.
STATEMENT OF ORIGINALITY

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another, except where due reference has been made in the thesis itself.

Paul John Davidson
s2611794
30 October 2016
# Table of Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Abstract</td>
</tr>
<tr>
<td>4</td>
<td>Statement of Originality</td>
</tr>
<tr>
<td>5</td>
<td>Table of Contents</td>
</tr>
<tr>
<td>6</td>
<td>List of Illustrations</td>
</tr>
<tr>
<td>7</td>
<td>Acknowledgements</td>
</tr>
<tr>
<td>9</td>
<td>Chapter One: INTRODUCTION</td>
</tr>
<tr>
<td>9</td>
<td>A Personal Perspective</td>
</tr>
<tr>
<td>10</td>
<td>The Basis of the Study</td>
</tr>
<tr>
<td>12</td>
<td>The Research Propositions</td>
</tr>
<tr>
<td>12</td>
<td>Research Methodology</td>
</tr>
<tr>
<td>14</td>
<td>Defining Davidson Documentary</td>
</tr>
<tr>
<td>16</td>
<td>The Found Story: Purpose and Content</td>
</tr>
<tr>
<td>18</td>
<td>The Studio Works</td>
</tr>
<tr>
<td>20</td>
<td>Chapter Two: TIME, CINEMA, PHILOSOPHY</td>
</tr>
<tr>
<td>21</td>
<td>The Cinematic Illusion</td>
</tr>
<tr>
<td>23</td>
<td>Cinema and Philosophy</td>
</tr>
<tr>
<td>25</td>
<td>Chapter Three: EDITING, TIME, SAMPLING</td>
</tr>
<tr>
<td>25</td>
<td>Creating Something Else</td>
</tr>
<tr>
<td>28</td>
<td>The Fourth Dimension</td>
</tr>
<tr>
<td>29</td>
<td>The Editing Paradox</td>
</tr>
<tr>
<td>30</td>
<td>Editing the Documentary</td>
</tr>
<tr>
<td>32</td>
<td>The Documentary Edit: Macro-Sampling</td>
</tr>
<tr>
<td>35</td>
<td>The Documentary Edit: Micro-Sampling</td>
</tr>
<tr>
<td>36</td>
<td>The Tommy Norton Interview</td>
</tr>
<tr>
<td>39</td>
<td>What a Difference a Frame Makes</td>
</tr>
<tr>
<td>43</td>
<td>Chapter Four: TIME and the TELEPHONE</td>
</tr>
<tr>
<td>43</td>
<td>Sharing Time and Space</td>
</tr>
<tr>
<td>44</td>
<td>The Great Time-sharing Trick</td>
</tr>
<tr>
<td>46</td>
<td>A PCM Primer</td>
</tr>
<tr>
<td>50</td>
<td>Analogy and Integrity</td>
</tr>
<tr>
<td>52</td>
<td>Sampling History</td>
</tr>
<tr>
<td>55</td>
<td>Chapter Five: RHYTHM and EDITING</td>
</tr>
<tr>
<td>55</td>
<td>Suite Rhythms</td>
</tr>
<tr>
<td>58</td>
<td>Cutting by Heart</td>
</tr>
<tr>
<td>61</td>
<td>A Blinking Nuisance</td>
</tr>
<tr>
<td>63</td>
<td>Chapter Six: The PHENOMENOLOGY of the EDIT SUITE</td>
</tr>
<tr>
<td>65</td>
<td>It’s a Kind of Magic</td>
</tr>
<tr>
<td>68</td>
<td>Chapter Seven: The Documentary Works</td>
</tr>
<tr>
<td>69</td>
<td>Past Forward</td>
</tr>
<tr>
<td>71</td>
<td>Ragged Bloody Heroes</td>
</tr>
<tr>
<td>76</td>
<td>Once Were Whalers</td>
</tr>
<tr>
<td>80</td>
<td>Chapter Eight: SUMMARY and CONCLUSIONS</td>
</tr>
<tr>
<td>82</td>
<td>Appendices</td>
</tr>
<tr>
<td>83</td>
<td>I: Studio Works—On-line Access</td>
</tr>
<tr>
<td>84</td>
<td>II: Selected Filmography: Paul Davidson</td>
</tr>
<tr>
<td>85</td>
<td>III: Editor Biographies</td>
</tr>
<tr>
<td>86</td>
<td>IV: Editor Interview Questions</td>
</tr>
<tr>
<td>87</td>
<td>V: Film Credits</td>
</tr>
<tr>
<td></td>
<td>Bibliography</td>
</tr>
<tr>
<td></td>
<td>Attachments</td>
</tr>
<tr>
<td></td>
<td>DVD: Past Forward</td>
</tr>
<tr>
<td></td>
<td>DVD: Ragged Bloody Heroes</td>
</tr>
<tr>
<td></td>
<td>DVD: Once Were Whalers</td>
</tr>
<tr>
<td></td>
<td>DVD: Time Rhythm Magic</td>
</tr>
</tbody>
</table>
## List of Illustrations

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Figure 1  Basic Historic Timeline</td>
</tr>
<tr>
<td>33</td>
<td>Figure 2  Sampling the Timeline</td>
</tr>
<tr>
<td>33</td>
<td>Figure 3  Sample Assessment and Assembly</td>
</tr>
<tr>
<td>34</td>
<td>Figure 4  Assembly and Transmission</td>
</tr>
<tr>
<td>36</td>
<td>Figure 5  Original Interview Clip</td>
</tr>
<tr>
<td>37</td>
<td>Figure 6  Sampled Clip</td>
</tr>
<tr>
<td>37</td>
<td>Figure 7  Compressed Clip</td>
</tr>
<tr>
<td>38</td>
<td>Figure 8  Jump Cuts Removed</td>
</tr>
<tr>
<td>38</td>
<td>Figure 9  Final Compressed Sequence</td>
</tr>
<tr>
<td>40</td>
<td>Figure 10 The Six-frame Blink</td>
</tr>
<tr>
<td>45</td>
<td>Figure 11 Telephone Time-Sharing</td>
</tr>
<tr>
<td>46</td>
<td>Figure 12 Time-Sharing cont</td>
</tr>
<tr>
<td>47</td>
<td>Figure 13 Typical Audio Waveform</td>
</tr>
<tr>
<td>47</td>
<td>Figure 14 Positive Peak Amplitude Levels</td>
</tr>
<tr>
<td>48</td>
<td>Figure 15 Sampling of Audio Signal</td>
</tr>
<tr>
<td>48</td>
<td>Figure 16 Sample Quantisation</td>
</tr>
<tr>
<td>48</td>
<td>Figure 17 Signal Comparison</td>
</tr>
<tr>
<td>49</td>
<td>Figure 18 Encoding Samples into Bits and Packets</td>
</tr>
<tr>
<td>49</td>
<td>Figure 19 Packet Assembly and Transmission</td>
</tr>
<tr>
<td>52</td>
<td>Figure 20 Building History Timeline</td>
</tr>
<tr>
<td>53</td>
<td>Figure 21 Sampling and Selection</td>
</tr>
<tr>
<td>61</td>
<td>Figure 22 Last Frame Blink</td>
</tr>
<tr>
<td>62</td>
<td>Figure 23 Last Frame Blink Avoided</td>
</tr>
<tr>
<td>62</td>
<td>Figure 24 Last Impressions</td>
</tr>
<tr>
<td>64</td>
<td>Figure 25 Editors</td>
</tr>
<tr>
<td>69</td>
<td>Figure 26 Annotated Storyboard</td>
</tr>
<tr>
<td>70</td>
<td>Figure 27 Storyboard continued</td>
</tr>
<tr>
<td>71</td>
<td>Figure 28 Ragged Bloody Heroes Montage</td>
</tr>
<tr>
<td>74</td>
<td>Figure 29 Annotated Storyboard</td>
</tr>
<tr>
<td>75</td>
<td>Figure 30 Storyboard continued</td>
</tr>
<tr>
<td>78</td>
<td>Figure 31 Annotated Storyboard</td>
</tr>
<tr>
<td>79</td>
<td>Figure 32 Storyboard continued</td>
</tr>
</tbody>
</table>

## Supplementary Material

| DVD: Past Forward | https://vimeo.com/190299939 |
| DVD: Ragged Bloody Heroes | https://vimeo.com/190299401 |
| DVD: Once Were Whalers | https://vimeo.com/190468146 |
| DVD: Time Rhythm Magic: Conversations with Film Editors | https://vimeo.com/190299402 |
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Many persons participated in, or contributed to, the four films completed during this study and all are acknowledged in the closing credits or otherwise. However special mention must be made of Sydney based singer/songwriter Luke O'Shea and Wellington based researcher/designer Barbara Gibb for their indispensable contributions to the film works. Much of it could not have happened but for the assistance and artistry of these two talented people.

The final and most deserved thanks goes to my dear wife Sheila, whose unconditional support and Welsh humour has kept me sane and smiling for years. I also wish to acknowledge my late mother Irene Davidson, for the help I always get from her whenever I really need it, even after her passing in 1992. Irene always wanted her eldest son to be a doctor—but even she might be surprised it took seventy two years!

Paul Davidson
October 2016
Chapter One

INTRODUCTION

In feature films the director is God; in documentary films God is the director.
— Alfred Hitchcock

A PERSONAL PERSPECTIVE

I embark on this professional doctorate study late in life, and make no claim to be an experienced researcher, fully conversant with the theories and methodologies of formal academic enquiry. I am happy to acknowledge that an inevitable consequence of such inexperience might manifest as a weakness in parts of the structure or content of the written component of the study. Nonetheless, with the assistance of colleagues and supervisors, I have strived for an acceptable, albeit imperfect, degree of academic rigour and discourse.

In balancing any such weakness, I believe that observations made and methods developed over thirty-seven years of professional practice have provided a solid base of primary experiential data. Reflective analysis of this data and its iterative implementation has clearly had a cumulative influence on my ongoing work. I also believe that although my documentary editing practice may not be dissimilar to that of many other editors, the analysis of the practice from a temporal communications perspective brings an original perspective to the study. This perspective has cumulatively enhanced my documentary editing practice over many years, and I believe its presentation in this DVA study, as set out in the exegesis and exemplified in the studio works, might also be a useful alternative perspective for other practitioners of the editors’ art.

Before embarking on this study, I was encouraged by the university's descriptor for its Doctor of Visual Arts degree, which states that “the professional doctorate is an integrated program of professional and research work, including a thesis that contributes to the generation of new knowledge and/or conceptual advances.” The descriptor goes on to state “You will develop the expertise needed to provide leadership in the field and you will gain research skills and the ability to articulate a theoretical position within a visual arts discourse.”

There is no doubt that the pursuit of this study, the reflective analysis of my body of work and the integration of such analysis into current studio practice has been of considerable personal inspiration and significantly enhanced my expertise in documentary work. I further believe that the concepts advanced in this study are original, their studio manifestations are of high professional standard, and the various propositions are well articulated and illustrated. Whether this amounts to a useful and/or significant contribution to knowledge within a visual arts discourse is
for others to judge. Perhaps the best judges of this might be fellow editors, but I make neither claim nor presumption.

Overall however, I can state unequivocally that the opportunity to conduct an analysis of my documentary editing practices, draw experiential conclusions from the analysis, and examine commonalities with digital communications systems, has positively contributed to my development as both working professional and reflective practitioner. I am hopeful that the reflections and conclusions of this exegesis, together with their practical manifestation in the presented studio works, might positively influence the work of others.

**THE BASIS OF THE STUDY**

As suggested by its title—*Time, Rhythm and Magic: developing a Communications Theory approach to Documentary Film Editing*—the principal topic of this study concerns the significance of the time domain in film editing and the time-related parallels that exist between film editing and digital telecommunication systems.

More specifically, the analytical research and associated studio works are concerned with the editing and assembly of documentary films of a retrospective nature. In my own experience with this type of film, I have found that although the basic facts and historical context may be known, the narrative structure and emotional arc of the film work are not necessarily pre-determined. In many cases the story is found, extracted and reconstructed after filming is completed, in the post-production or ‘editing’ phase. In this phase the principal responsibility for re-creating the story from a multitude of diverse elements and re-presenting it in a creative and cohesive screen form lies with the documentary film editor, working with the film’s director— noting of course that the editor may also be the director.

This research argues that the editing of such documentary films involves much ‘sampling’, that is, a process whereby small parts of a whole are chosen and re-constructed as representative of that whole. This sampling occurs at many levels. Initially, as the broad narrative structure of the documentary is constructed, a process of selection occurs which we shall call ‘macro-sampling’. This may be thought of as selecting relevant pieces of ‘content’ and assessing the relevance of any particular piece and its contribution to the story. The process continues at increasingly precise levels of temporal sampling, down to durations of a second or less, which we shall refer to as ‘micro-sampling’.

In my own editing practice, I have come to regard the temporal aspects of the selections to be as equally important as the content. That is, what is the duration of the sample, at what speed do things happen within it, what inherent rhythms lie within it, how might those rhythms interplay with other clips when integrated into a sequence?
These temporal aspects of duration, speed and rhythm are of course all sub-sets of a common base—time. Time also underpins the core proposition of this study, which is that time is a discontinuous dimension which may be sampled, manipulated and assembled into convincing re-presentations of reality, re-presentations which occur in both communication systems and documentary film. It is these two disciplines which are specifically considered in this study, although it is not claimed that temporal re-presentation is exclusive to them.

In my experience as a director and/or editor of many such constructed documentary works, I have concluded that although the macro-sampling process is the principal determinant of content and story structure, it is principally the micro-sampling that, although imperceptible to the viewer, determines the rhythmic flow elements that contribute greatly to engagement and emotional resonance in an audience.

This notion is examined by referencing examples of time manipulation in the construction of the studio works, manipulations demonstrated as invisible to the viewer but crucial to the overall rhythm and flow of the finished documentary work.

I have also referenced my earlier experience as a telecommunications engineer to propose that useful analogies to the sampling processes described in documentary filmmaking may be found in digital telecommunication systems. In these systems, small samples of time are extracted, measured, encoded, grouped and processed into sub-sets, then transmitted and re-assembled as a reductive re-presentation of the original. However unlike the precise mathematically determined time sampling in digital communication systems, the sampling and assembly that occurs in film editing is determined by a complex combination of cognitive, emotional and organic responses which shape the final creative decisions of the editor.

By this creative sampling and restructuring of cinemematic time, I believe my own documentary films, and those of many others, present convincing but fundamentally illusory representations of reality to the audience. What they see is not the truth, even though it may be truthful. It is suggested that in doing this, directors and their editors operate in similar manner to a magician, using a skilful but invisible sleight to infuse their work with a special, mysterious or inexplicable quality, which many describe as ‘magic’.¹

¹ A recent documentary on the life and work of famous film actor and director Orson Welles was actually titled Magician. (Cohen Media Group: directed by Chuck Workman, 2014)
THE RESEARCH PROPOSITIONS

With the temporal considerations set out above as the overarching purpose of the study, the four specific propositions argued herein are:

1) the process of constructing certain forms of documentary film involves the selection of small segments, or samples, taken from a large whole and re-assembled into sequential sub-sets to create a reductive re-presentation of that whole.

2) Useful analogies exist between this sampling and re-assembly process in documentary film editing and the process of sampling, encoding and re-construction inherent in digital telecommunication systems;

3) This temporal sampling and manipulation may be integrated into finished film works in a manner whereby it cannot be perceived, and is thus invisible, to the film viewer, who remains unaware of the mechanisms even when fully engaged with the outcome. By this means, a documentary film editor creates convincing but illusory representations of reality, illusions which can be described as a form of ‘magic’;

4) Film editing is a highly iterative process involving a complex combination of cognitive, emotional and organic resonances within the editor. This combination of resonances is an experience shared by many editors, and may be characterised as a unique ‘phenomenology of the edit suite’.

These four propositions are argued with qualitative experiential data from professional practice, illustrated with examples, incorporated into specific studio works and placed with analyses and conclusions into the body of the exegesis.

RESEARCH METHODOLOGY

A major part of the study is based on experiential and empirical methodology drawing upon the author’s experience as a graduate telecommunications engineer in both analogue and digital systems, and upon his significant body of work in directing and editing documentary films. An analysis of key concepts is made based on observations, calculations, experiments, comparisons and conclusions reached in thirty five years of creative practice. This ongoing iterative analysis has then been progressively distilled into empirical propositions and conclusions, adapted into creative practice and given material form in original studio works informed by, and contributing to, the research.
The temporal sampling and manipulation techniques developed in the author’s creative practice are described. Sampling in the documentary context is illustrated diagrammatically and referenced to the studio works. The concepts of ‘macro-sampling’ and ‘micro-sampling’ as integral parts of the documentary editing process are introduced, with supporting explanation and illustration.

The study suggests that the manipulations of elements of time, rhythm and duration that are made during the construction of documentary film are generally invisible to the audience. Providing arguments and examples to support this proposition presents something of a quandary. If the results of the temporal manipulations are indeed invisible in the finished film, how can they be convincingly demonstrated? It seems that without an explicit demonstration of the options an editor might consider, and some form of ‘before’ and ‘after’ comparison, the research proposition will remain unseen and unproven. No definitive answer to this quandary is provided, but an examination of process and diagrammatic examples from the studio works are provided and some ‘invisibilities’ thus revealed.

The basic principles and practice of sampling in digital communication systems are outlined and explained diagrammatically, drawing on the author’s early career as a communications engineer. Analogies that exist between sampling, rhythm, and resonance in film and their equivalents in telecommunications are graphically illustrated, and a number of qualitative parameters for assessing the integrity of the sampling process in both disciplines are examined.

The study also reflects more broadly on time as a discontinuous, divisible and malleable element in documentary editing, and argues that time-based rhythm is a crucial determinant of the flow, cohesion and emotional impact of documentary film. The topic is introduced by examples from the literature supporting the notion of discontinuous time, including its significance in the technology and psychology of cinema. The idea of commonalities between the nominally disparate disciplines of cinema and telecommunications is introduced, commonalities which are later explored as central to the sampling propositions of the study.

The hypothesis that audience response to a sequence of shots cut together might be partially due to reactive resonances with natural physiological rhythms is examined and demonstrated, in particular with respect to the editor as ‘first audience’. This is supported with some quantitative analysis, and further explored in filmed interviews with a number of experienced editors.

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2 Further discussion of the editing paradox in Chapter Three

3 *Time Rhythm Magic: Conversations with Film Editors*, directed by Paul Davidson, (DVD, 22 minutes, 2013)
Those same editors are also interviewed more broadly, in a qualitative phenomenological research study. This study seeks support for the proposition that in constructing their diverse films, editors share common knowledge, understandings and experiences unique to them and them alone. The methodology employed was to locate and interview a number of experienced film editors of various cultures and specialities. The responses were then grouped and analysed for commonalities in the various editors’ experiences, influences and edit suite responses. The outcome sought from this methodology was to determine whether there might be a special ‘phenomenology of the edit suite’, and in so doing, better understand the shared experience of ‘being’ an editor.

DEFINING DAVIDSON DOCUMENTARY

As the reflective analysis of this study derives principally from the author’s extensive body of documentary work, together with associated studio works, it is appropriate to consider where these works might lie in the broad spectrum that is ‘documentary’.

Many persons have proposed definitions of the documentary genre, or attempted to do so, starting with the so-called ‘father’ of documentary, Scottish filmmaker and theoerist John Grierson. He famously described documentary as “the creative interpretation of actuality”, and his various and pronouncements on the subject have been hugely influential. In particular Grierson’s works and analyses are regarded as an excellent encapsulation of:

The central tension that constitutes all debates about documentary: the relationship between reality and artifice.

It is self-evident that the documentary film shares the audiovisual temporal characteristics of any other film, including the fictional feature film. However the documentary film has not generally attracted as much analytic attention as the fictional film, possibly because the documentary spectator has a self-fulfilling expectation that they are viewing ‘truth’; the possibility that they are being deluded by manipulations of filmic time is less imagined. Whatever the reasons, as Wahlberg writes:

Not even Gilles Deleuze recognised the complex relation between the time of the image, allegories of time and time experience in documentary. (added emphasis) This is remarkable given that his idea of cinema as the mnemonic machine par excellence has

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much in common with the sublime representations of time, history and memory offered by documentary.\(^6\)

In the early years of my film career (1979–1982), I did not normally describe my work as ‘documentary’. In retrospect, this was possibly a reflection of the times, when a television ‘documentary’ was almost always of the earnest narrator-driven form favoured by the BBC and other broadcasters. Rather, my initial productions were thought of simply as short films about various subjects, where I hoped there might be a story which would connect with an interested audience.

The 1983 establishment of my production company Capcom (Capital Communications Company Ltd) in Wellington allowed me some choice in pursuing my story interests, and the company came to specialise in films about mental and physical health, disability, sexuality and social issues. Along with these the company produced many short films on new technology and digital communications, plus a number of historical stories, these latter works being the stimulus for a subsequent career focus on historical documentary.

I came to describe all these films as ‘documentary style’, meaning they involved ‘real people, doing real things’. The bulk of the story would be told as first-person reflective testimony, although occasionally the subject matter was of such complexity that some expository narrative was essential.

The Capcom crew would thus find ourselves in various parts of the country, filming in sensitive and sometimes daunting institutional situations, where we shot real-time events, illustrative sequences and personal interviews with a wide range of participants. Examples of those early works are included in my filmography\(^7\). We told stories of premature babies, severely disabled children, sexual and mental health, death and dying, prisons, rehabilitation and the justice system, all of these stories incorporating aspects of New Zealand’s increasingly multi-cultural society.

These were all films full of real people responding to real situations, so all fell within my definition of ‘documentary style’. However, the often difficult subject matter was not easy to turn into engaging and informative screen stories for a general audience.

The production team came to realise that the more difficult the actuality of the subject, the more creative we had to be in our efforts to produce a satisfying story for the audience. We were dealing with real situations, so the story was essentially non-fiction, but the televisual remediation of the story demanded that many creative

\(^6\) Wahlberg, *Documentary Time: Film and Phenomenology*, xi

\(^7\) Appendix II: Selected Filmography–Paul Davidson
devices, subtle or otherwise, be employed. We were making, as Sheila Curran Bernard describes it, ‘creative non-fiction’.  

Later productions became increasingly of a retrospective nature, stories of past people and past events and their connective relationships with the present. The content of these stories was of real people doing real things and fell within Grierson’s ‘actualities’. The production team came to realise that the more difficult or sensitive the actuality, the greater the creative challenge in finding, extracting and presenting an effective screen story. The response to that challenge might come in scripting, imagery, performance, location or cinematography, but the greater creative alchemy often occurred in the darkness of the edit suite.

Some years later it was illuminating to find a more academic definition that succinctly summarised our documentary filmmaking endeavours. Bernard describes it as:

an organic and often time-consuming process in which a filmmaker approaches a subject, finds (as opposed to imposes) a story within that subject, and then uses a wealth of narrative devices—structure, character, questions, point of view, tone, stakes and more—to tell that story truthfully and artfully, so as to attract and actively engage an audience.  

This precisely encapsulates much of my personal methodology and experience as a maker of ‘documentary style’ films, stories about real people and real events in a truthful but artful screen presentation.

Bernard goes on to challenge the use of the general term ‘documentary’ to describe any and all forms of nonfiction film, and uses the analogy of a library, where the term ‘nonfiction’ would not be a very useful category for a vast number of such books, regardless of their content, purpose, format, style, readership or form. So she extends her definition of documentary film to be the audio-visual equivalent of creative prose: ‘creative nonfiction on screen’.  

I have adopted this as a satisfactory description of my own work.

THE FOUND STORY: PURPOSE AND CONTEXT

It was also works similar to Bernard’s ‘found’ story that most differentiated my documentary filmmaking from dramatic fiction production. In the latter, it is usual that the story, the script and the order of scenes is pre-determined and precisely planned well in advance of any filming. The editor’s task is then a methodical

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9 Ibid., xiii
10 Ibid., 3
cataloguing of takes, assessment of the creative options and assembly into the pre-
scribed narrative arc. In contrast, the director of a ‘found’ documentary may often
have no idea of how the story might evolve as filming commences, but will
nevertheless record the ongoing events and related material. When filming is
complete the director and editor will then begin exploring and assessing a great deal
of diverse footage, seeking connections, extracting the essence and giving it form.
The raw material may be non-fiction, but as A K Stout pointed out to the Board of the
Australian Broadcasting Corporation in 1944:

   Documentary is not just a haphazard record. It is dramatic. It dramatizes life without
distorting it… The documentary director selects and arranges his material in such a way
as to get across a coherent and revealing story.11

Employing creative devices to make documentary more ‘dramatic’, inevitably gives
rise to the question of ‘truth’ in documentary, and whether any form of editing at all
must necessarily destroy any claim to truth. In my view the answer to this question
can only be, “It depends.” As Paul Ward writes:

   All documentary films are nonfictional, but not all nonfictional films are documentaries…
there is nothing inherently ‘fictional’ about narrative structure and the editing styles that
have developed to tell stories. The key distinction is never one of form or style, but rather
of purpose and context.12

‘Purpose and context’ might also define documentary in terms of the relationship
between creator and spectator. Who is making this film? Why? Who will watch it?
Why? Perhaps any notion of truth in documentary is necessarily equivocal; it certainly
demands clear distinction between ‘truth’ and ‘belief’. The distinctions are especially
pertinent to this study if we re-state the question as: if documentary editors
creatively sample and manipulate both content and time in a manner imperceptible
to the viewer, are they still presenting truth? Can creative illusions of reality be
presented as actuality? Is there a difference between ‘truthful’ and ‘truth’?

These questions are not the principal focus of this study, which is concerned with the
temporal mechanisms of sampling and manipulation in documentary construction.
But in employing such techniques, a responsible documentary maker will be making
constant judgements, along blurred boundaries, about the purpose, intent and effect
of their ‘creative non-fiction on screen.’

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8 Trish Fitzsimons, Pat Laughren and Dugald Williamson, *Australian Documentary: History, practices and
genres* (Sydney, NSW: Focal Press, 2011), 243
12 Ward, *Documentary: The Margins of Reality*, 7
PHENOMENOLOGY OF THE EDIT SUITE

The first three propositions of the study relate principally to temporal aspects of the documentary editing process. The fourth and final proposition is concerned with a more general exploration of the editing experience. This involves a limited and academically risky attempt to assess and define both the cognitive and emotional experiences that form part of ‘being’ an editor. The quest is ‘limited’ because there is only one fully available editing practitioner—myself—and access to other practitioners was restricted by finance, geography or availability. Review of the literature provides further argument and support, and overall I believe the study has provided valid and useful results, which might well be extrapolated beyond the limited participant sample to encompass a larger editing population.

This exploration is also academically ‘risky’ because I could find no more appropriate description of the common editing experience than the word ‘magic’. It would be fair to say that my academic advisors struggled with the use of this word in the exegesis, their main concern being that it there is insufficient rigour in its common usage or meaning for academic purposes. As opposed to that understandable view, every editing practitioner interviewed affirmed the word as the only satisfactory encapsulation of what happens in their edit suites. It happens not on a daily basis, but as the culmination of much editing endeavour which eventually produces an amalgam of audio and visual elements that creates a powerful emotional resonance in the first viewer—the editor.

In short, this part of the study is firstly, an attempt to analyse and verbalise my own edit suite experiences, and secondly, to determine to what extent these experiences might be shared by other editors. The results might offer a reassuring critique of my own practice, and also support the qualitative phenomenological concept that film editing is a shared and special group experience. In other words, it might provide a more formal validation of my own belief that the edit suite experience is fully understood only by fellow practitioners.

THE STUDIO WORKS

The propositions of the study draw heavily on the author’s experiential data drawn from some thirty-five years of documentary-style film-making and several hundred completed works. Additionally a number of studio works have been completed in the course of the study, all of which have been influenced by and contributed to the arguments of this study. Four of these works are presented as the substantive part of this DVA submission.
Three of these documentary works tell stories of the past and can thus be categorised as reflective historical documentaries. Each film illustrates in various degrees the propositions of the study, which relate to the sampling process and invisible temporal manipulations. The three films are distinctly different in content, narrative structure and dramatic style, and respectively illustrate the expository, testimonial and poetical documentary genres.¹³

The fourth film— *Time Rhythm Magic: Conversations with Film Editors* —is the practical manifestation of a small-scale qualitative research study investigating the phenomenology of the edit suite. This film is a selection of first-person interviews with experienced film editors, and is submitted principally as a source of qualitative data for the final proposition of this study—the special phenomenology of the edit suite and the existence of ‘magic’ in the editing process. This fourth film addresses some aspects of time and rhythm in editing, but is neither intended, nor submitted, as support for the sampling proposition argued elsewhere.

The four studio works, supported by this written exegesis, constitute the full research thesis hereby submitted for a professional Doctorate in Visual Arts.

¹³ Further discussion of these documentary genres in Chapter Seven
Chapter Two
TIME, CINEMA, PHILOSOPHY

The only reason for time is so that everything doesn’t happen at once.
—Albert Einstein

As its title implies, time and rhythm are at the heart of this study, and much of the argument involves time as a parameter that can be divided, shared and manipulated in various ways. It is thus appropriate to commence the study with a more general reflection on the nature of time.

In our everyday life, time is invariably framed as a numeric or spatial measurement of uniform, rhythmic, measurable and predictable segments of duration passing by in continuous and universal homogeneity. Our ability to ‘tell the time’ in a measurable and consistent clockwork manner is useful in an industrial synchronised digital world, even though time itself might remain something of a mystery. In this context, the idea that time may not in fact be an inalterably advancing parameter seems an enigma.

Physicist Albert Einstein developed a model in which time and space are linked as both necessary and sufficient conditions for the existence of anything. Our spatial reality is determined by the three dimensions of length, width and depth, with time as the necessary fourth dimension. Einstein further postulated that in this four-dimensional space the past, present and future must all exist simultaneously, and there could thus be no separation of the condition we call ‘now’. In 1952 he wrote:

Since there exists in this four dimensional structure no longer any sections which represent ‘now’ objectively, the concepts of happening and becoming are indeed not completely suspended, but yet complicated.\(^{14}\)

For Einstein there was no true division between past and future, there is only a single four-dimensional existence. He gave moving testimony to this belief when his lifelong friend Michele Besso died and Einstein wrote to the family saying that although Michele had gone before him, it was of little consequence because:

…us physicists believe the separation between past, present and future is only an illusion - although a very convincing one.\(^{15}\)

This study similarly suggests that the separation between past, present and future for the film editor might be somewhat illusory. A bin of footage might be filled with


\(^{15}\) Albert Einstein, quoted by Jeremy Bernstein in “A Critic at Large: Besso” (*The New Yorker*, 1989)
material from many times and places, and the editor is free to select and assemble in a filmic chronology with little regard for real time. So a documentary filmmaker is not constrained to a predictable recitation of events in the order in which they occurred. The finished film may proceed in a linear fashion, but many segments of past, present and future time may be juxtaposed in the story-telling. As Sheila Bernard says:

> It involves the interweaving of chronological and non-chronological elements to form a cohesive and satisfying whole—a film that drives forward while being enriched and made complex by elements outside or apart from the chronology.\(^{16}\)

A responsive, and responsible, documentary editor would do this creative interweaving of time with integrity and purpose. It may be a chronological story—a biography or a history for example—but it does not have to be told in a chronological manner.

For the communications engineer, time is also something that can be sliced, sampled and shared, and the invisible manipulations with which this is done create our entire digital world. Similarly time is the element—the necessary catalyst for creative alchemy—with which filmmakers craft rhythms and resonances to give us the gripping narratives and beautiful illusions of the cinema. In fact, traditional cinema is a literal example of the illusions created by a discontinuous process, and cinema, telephony and philosophy share a surprisingly close temporal commonality.

**THE CINEMATIC ILLUSION**

The history of cinematography, like the history of photography, is a history of parallel invention initiated by the industrial revolution and continued with an outpouring of ideas in Europe and America through the nineteenth century. The ‘Cinematographe’ that Auguste and Louis Lumiere unveiled to the public in 1895\(^ {17}\) had its technological basis in the 1882 ‘Chronophotographe’ of Etienne-Jules Marey, a physiologist who used his early camera as an instrument to study the mechanics of locomotion. Marey’s mechanism produced a single image containing a succession of overlapping moments in which a fleeting passage of time—‘chronos’—was rendered permanently visible. With the resultant ‘photographe’, Marey was able to capture past temporal durations as printed spatial distances, that could be measured and analysed at leisure.

\(^{16}\) Bernard, *Documentary Storytelling*, 63

\(^{17}\) The first display of the Cinematographe was on 22 March 1895 at 44 Rue de Rennes in Paris. A short unedited film *Workers leaving the Lumière Factory* was screened, this first film being also the first documentary. The first public screening occurred on 28 December 1895 at the Grand Café, Boulevard de Capuchines, Paris. This was the first performance of ‘cinema’ as we now know it.
The cinematic illusion that so awed the first Parisian audience, and audiences ever since, depends on temporal elements. The projection mechanism operates in a repetitive alternating cycle, and the timing of that cycle determines the success of the illusion. That success depends on the duration each image is projected for, the duration for which no image is present at all, and the rate at which this rhythmic pattern occurs. The traditional cinema mechanism thus merges a series of precisely timed discontinuities to create an impression of continuous movement from nothing but still images.

Both in filming and projection, cinema is created by a kind of clockwork mechanism which links time and vision in a ‘clock for seeing’, as Roland Barthes first described it. But the linking of time to vision, and the clicking shutter as the echo of a ticking clock, are not the only temporal relationships. As Bliss Cua Lim writes:

The cinema and its photographic base have been repeatedly compared to a clock, since both machines represent time and movement as measurable and divisible into uniform intervals... On the one hand, the cinema as clockwork apparatus belongs to the regime of modern homogeneous time; on the other, fantastic narratives strain against the logic of clock and calendar, unhinging the unicity of the present by insisting on the survival of the past or the jarring coexistence of other times.

Experiencing the temporal disruptions of narrative, and the continuous fluid movement of the cinema, is thus a dual illusion. Watching a projected film, we do not see an uninterrupted moving image; in fact, we do not ever see anything moving at all. We are actually looking at a series of completely still pictures, each of which is shown for a fraction of a second before being replaced by complete darkness, then another picture, in a synchronised and regular cycle which necessarily must run ‘like clockwork.’ Even then, as Richard Barsam notes:

As the projector moves one of these images out of the frame to replace it with the next one, the screen goes dark... we spend a good deal of our time in movie theatres sitting in complete darkness, looking at a screen with nothing on it at all.

The cinema thus involves a dual temporal trick of perception. It creates the illusion that we are seeing movement, from nothing but a series of still images, and it lets us think we are watching a continuous image, when for one third of the time we are watching a blank screen. These are not the only temporal tricks of the audiovisual media, as we shall see.

19 Bliss Cua Lim, Translating Time - Cinema, the Fantastic, and Temporal Critique (Durham, UK: Duke University Press, 2009), 11
20 Richard Barsam, Looking at Movies: An Introduction to Film (New York NY: Norton, 2004), 24
At the same time as the Lumiere brothers were astounding Paris, French philosopher Henri Bergson was developing the theories soon to be published in his acclaimed work *Time and Free Will*. He wrote this in late nineteenth century Paris, the time and place of cinema’s birth, and was as enthralled as everyone else by the brothers’ new invention.

However, it was not the apparatus that performed these audience delusions that most interested Bergson. He saw that the new cinematic machinery belonged to a shared genealogy of mechanical clock, wireless telegraph and railroad, devices that brought profound changes in our appreciation of time and space, especially the tendency toward denaturalization, homogenisation and standardization initiated by the industrial revolution. It reinforced his model of ‘spectatorship’ as a failure to understand the heterogeneity of true duration, and hence an inability to recognize the artificialities of perception. Bergson wrote:

> Perception, intellection, language so proceed in general. Whether we would think becoming, or express it, or even perceive it, we hardly do anything else than set going a kind of cinematograph inside us. We may therefore sum up what we have been saying in the conclusion that the mechanism of our ordinary knowledge is of a cinematographical kind. (original emphasis)

Bergson had recognised that the new apparatus provided a convincing illustration of the cinematographic nature of reality. As Lim puts it:

> The moving picture, therefore, is a mechanical illusion that substitutes abstract movement for the real, specific movement of pure duration. Thus the cinema, like human perception, is a mechanism of substitution—the mechanical substitution of discontinuity (a given number of frames per second) for real existential continuity.

The ‘false movement’ created by the motion picture apparatus inspired Bergson’s ‘cinematographic mechanism of thought’ which likewise encompasses the misconceptions of natural human perception common to both modern science and ancient Greek philosophy. Eighty years after Bergson wrote this, Gilles Deleuze, author of the *Cinema* volumes, wondered:

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23 Lim, *Translating Time*, 58
Does this mean that for Bergson the cinema is only the projection, the reproduction of a constant, universal projection? As though we had always had cinema without realising it?24

The cinematographical model embodies a fundamental duality. The linear, ordered and measurable intervals of its clockwork mechanisms permeate science and engineering, while the illusory perceptions those mechanisms generate inspire poet and philosopher. We should hardly be surprised by this. A popular descriptive analogy for the philosophical concept of phenomenology is a scene of prisoners chained in Plato’s Cave, a fire behind them casting shadows on a wall in front of them. That wall of flickering light and rippling shadows becomes their only perceived reality. Is a cinema audience, sitting transfixed in virtual chains of escapism, doing anything much different to Plato’s prisoners? As Bergson says, “The cinematographical method forces itself upon our science, as it did already on that of the ancients.”25

Bergson went on to suggest that a compelling explanation for the unprecedented realism of the cinema he was now experiencing, despite its flickery, mute and monochromatic nature, was rooted in the manner in which it mirrored our own perceptions. That is, the convincing quality of the illusion did not rest in its fidelity to the real; rather the cinema feels so realistic because of its resemblance to the nature of our perceptions.

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25 Bergson, *Creative Evolution*, 330
Chapter Three

EDITING, TIME, SAMPLING

Editing. I dislike this word and think the French expression “montage” far more adequate and expressive, for it means “assembly”—and that is really what happens in editing.

—Bela Balazs

CREATING SOMETHING ELSE

Since the birth of cinema, filmed images have been imagined, then realised, in vast quantities. Initially just the repeatable re-presentation of everyday life was sufficient to enthrall early audiences. The Lumiere brothers’ first cinematograph was in fact camera, developer and projector in one, and audiences were captivated by the simple screening of everyday events in one continuous shot.

The next step towards editing as we know it was achieved by stopping the camera, changing the viewpoint or the scene, and re-starting. The Lumieres pressed on with what they called ‘phantasmagorical views’—fictional stories with some narrative ambition—but these were all limited to the seventeen metres of film that could fit on a reel. At the same time, fellow Parisian Georges Méliès was creating films of increasing artistic content and complexity, achieving international fame with his 1902 creation Le Voyage dans la Lune.26 He had mastered the process of joining pieces of film together to achieve the fourteen minute duration of his story, but the various changes of view and action were still achieved by stopping and re-starting the camera. There was no film sound, other than a live musical performance that might accompany each screening.

As technology improved and possibilities multiplied, the act of joining two pieces of film, then joining other pieces, and showing them in a repeatable sequence, became far more than a succession of scenes or a clerical cataloguing. Those doing the cutting and joining would doubtless make assessment of the aesthetic content of each shot, for example who or what was in it, what they were doing, how they were doing it, the narrative and emotional content. They would also make temporal choices as they joined the shots—how long each clip would be, and when in the sequence it would appear. These decisions turned disparate pieces into a ‘something else’ that was more than the sum of those pieces; it could also be something quite different from the individual parts. As Edward Dmytryk reflects:

Not too long after Edwin S Porter started experimenting with the intercutting of related and simultaneous action, and D W Griffith decided to shoot a ‘close-up’ to increase the dramatic impact of a player’s reaction, filmmakers found that by means of a ‘cut’ they could manipulate pace, time, emotions and emotional intensity to an extent limited only by their

26 A Trip to the Moon was the most famous of Georges Méliès many films. It premiered in September 1902.
individual instincts and creative abilities. Film editing thus became the essence of ‘motion pictures’.27

Clearly the content, performance and aesthetics of individual scenes contribute to the cohesiveness of a finished edited sequence. But in my experience Dmytryk is entirely correct in describing an editor’s almost unlimited ability to “manipulate pace, time, emotions and emotional intensity”. I agree that what makes a sequence ‘something else’ is largely determined in the temporal fourth dimension, and it is the distinction between sequential recorded time and disconnected filmic time, that makes that difference.

The ‘something else’, even (or perhaps especially) in documentary, is likely to contain highly mediated illusions of the re-presented reality, illusions almost entirely created by an editor’s manipulations. This has been the case since the first film montages were created, as one of the most original cultural critics of the twentieth century acknowledged in the 1930s. German philosopher and cultural critic Walter Benjamin, contrasting the place from which the film illusion arises with the equivalent in theatre, wrote:

The complex and highly artificial manner in which a film creates an illusion of reality gives it a particular status in the technical mediation of contemporary life… In the theatre one is well aware of the place from which the play cannot be immediately detected as illusionary. There is no such place for the movie scene being shot. Its illusionary nature is that of the second degree, the result of editing. (added emphasis)

—Walter Benjamin28

The disconnected temporal relationships created by editing in cinema were of much fascination to early practitioners. In 1929 Russian director Vsevolod Pudovkin wrote:

… after the cutting and joining of the separate pieces of celluloid, there arises a new filmic time; not that real time embraced by the phenomenon as it takes place before the camera, but a new filmic time, conditioned only by the speed of perception and controlled by the number and duration of the separate elements.29

Pudovkin enthusiastically and effectively used the new freedoms of filmic space and time in creating his own significant movies. But he had no doubt where the creative force came from, and the opening words of his 1929 book are unequivocal:

“The foundation of film art is editing.” (original emphasis)30

27 Edward Dmytryk, On Filmmaking (Boston, MA: Focal Press, 1986), 413
30 Ibid. xiii
Russian film theorist Sergei Eisenstein formulated the idea that time in cinema does not necessarily flow as the linear sum of the duration of each individual shot. He used the term ‘vertical montage’ to indicate the process of superimposition and integration of the various structural elements of cinema, wherein integration had to take place not only horizontally (from shot to shot) but also vertically, in the manner of an orchestral score. This juxtaposition:

...binds all the details into a whole, namely, into that generalised artistic image, wherein the creator, followed by the spectator, experiences the theme.\(^{31}\)

Eisenstein, a former civil engineer, also experimented with ‘rhythmic montage’ where he joined different film scenes at mathematically precise intervals so that the resultant visual ‘beat’ would build a layer of rhythmic tension beneath the explicit dramatic tension of the images.\(^{32}\)

His compatriot Andrei Tarkovsky, from the next generation of Russian filmmakers, agreed that time was the essence of film-making, although to him it was the time embodied within the shot that mattered most:

The image becomes authentically cinematic when (amongst other things) not only does it live within time, but time also lives within it, even within each separate frame.\(^{33}\)

Eisenstein and Tarkovsky differed in their theories of time in cinema, especially their approach to editing. It is the former’s montage theories that better encapsulate my own experience of editing, which is that the manner each shot is perceived is dependent on what shot immediately precedes it in the sequence, what shot precedes that, and so on, until every shot in the film resonates in some way with every other. Because of this, the temporal context in which the shot is placed is as significant as its physical and temporal content.

As the editor makes these time-based decisions, the assembled film becomes a medium of inter-dependent time-based relationships, with each seemingly separate part impacting on all that has gone before and that which is to come. In that sense, as Janet Harbord says:

Editing perhaps is a virus, spreading its dis-ease into each new part, a lateral movement of disturbance and connection.\(^{34}\)

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32 A well-known example of Eisenstein’s rhythmic montage is the Odessa steps scene of *Battleship Potekim*. *Battleship Potekim*, directed by Sergei Eisenstein. Film, 75 minutes (Mosfilm, released 21 December 1925)
34 Janet Harbord, *The Evolution of Film* (Cambridge, UK: Polity Press, 2007), 80
Few editors would think of themselves as perpetrating such ‘acts of contagion’ in Gilles Deleuze’s use of the term.35 My personal approach to this is an acceptance that a ‘principle of uncertainty’ underpins all editing, and the response to any shot or sequence cannot be definitively assessed until contextualised within the entire finished assemblage. Editing thus becomes a highly iterative process wherein no logical or emotional decision ever has a totally predictable consequence. As Harbord continues:

Editing, more than any other aspect of cinema, unleashed the contingent into filmic structure. Through editing, images take up a sense of an indeterminate and endlessly contingent relation. In mixing up the temporal logic of the recording, editing threatens to unravel the ‘natural’ relation between things. In creating juxtapositions of image, the effect was not only of temporal dysfunction, but of contrasts of scale and space.36

THE FOURTH DIMENSION

In its fundamentally two-dimensional form, each individual frame in a film has an aesthetic content, a property found in any traditional work of art. That aesthetic will combine elements of form, pattern, lighting, colour and composition into an image which the viewer may engage with and take meaning from. In this sense a film frame is comparable with much other visual art.

It is its temporal existence however, which makes the film frame so different. Much static visual art, whether of two or three dimensions, contains no significant temporal component. Its time relationship with the viewer is entirely subjective—it is available for enjoyment or interpretation for a period of time entirely of that viewer’s choice.

In contrast, a filmed projected image exists for only a moment. It is offered to our gaze for a specific brief duration, a duration which is determined and fixed forever by the film editor. Because of this, as Malin Wahlberg writes:

The moving image challenges the classical contemplative mode of watching an image during an elective moment. In this case our eye meets with the time of artificial views, not forgetting the time of edited sounds.37

Every film clip has therefore both an aesthetic property and a temporal property. The latter can be assessed as simply duration, or by the more subtle rhythms of filmic time within the clip. In my practice as a documentary editor, seeking a cohesive story from a mass of raw footage, the temporal aspects of a clip are often as significant as

35 Deleuze, Cinema 2: The Time-Image, 40
36 Harbord, The Evolution of Film, 80
37 Malin Wahlberg, Documentary Time: Film and Phenomenology (Minneapolis, MN: University of Minnesota Press, 2008), ix
its content. This is by no means a unique or new approach. As Tarkovsky says of editing:

We could define it as ‘sculpting in time’. Just as a sculptor takes a lump of marble, and, inwardly conscious of the features of his finished piece, removes everything that is not a part of it—so the film-maker, from a ‘lump of time’ made up of an enormous, solid cluster of living facts, cuts off and discards whatever he does not need, leaving only what is to be an element of the finished film, what will prove to be integral to the cinematic image.\(^{38}\)

The raw materials for the sculpting are scene, image and performance, created on set or location. Once the filming is done, as Jerome Turner says, the editor’s work begins:

In many ways a director makes a movie on the set and the editor creates it on the screen. Both are filmmakers, but the editor works as the interpreter for the director. In doing that, the editor has to draw the viewer into the film and place them exactly where they want, every step of the way.\(^{39}\)

The early silent films of Eisenstein, Pudovkin and their contemporaries needed no literal interpreter for screening in the West. But Pudovkin, who often both directed and edited his own films, understood where the creative energy came from:

Once more I repeat… that editing is the creative force of filmic reality, and that nature provides only the raw materials with which it works. That, precisely, is the relationship between reality and the film.\(^{40}\)

Perhaps not everyone would entirely agree with Pudovkin when he describes editing as “the creative force of filmic reality”. But I certainly do, and I believe most editors would also.

**THE EDITING PARADOX**

Yet there exists a great editing paradox. I am confident most directors know that a skilled and sympathetic editor—even if it is themselves—can make a mediocre production look good, and a good production look even better. This is especially true in observational documentary, where the raw material may be obtained in imperfect conditions, from untrained performers, in unscripted scenarios. The editor’s task is to create a believable situation, a coherent story and an emotional arc from this in a way that links, flows and engages. But the great paradox is: the better the editor does this, the less the audience notices their work. The paradox is neatly summed up in the words of Ephraim Katz:

\(^{38}\) Tarkovsky, *Sculpting in Time*, 63–4
\(^{40}\) Pudovkin, *Film Technique*, xvi
Often, an editing job is considered successful when it goes unnoticed on the screen. Ironically, an editor invests weeks or months of intensive work to achieve the impression that he or she has done nothing at all.\textsuperscript{41}

How a film is edited is generally unnoticed, and thus essentially invisible, to the spectator. In my experience the only time an audience notices the editor’s work—unless they are editors themselves—is when the editing is bad. This possibly explains why most editors are quietly introverted and self-deprecating artists, because, as Katz continues:

Working behind the scenes, away from the glare of publicity and the glamorous surrounding of the film set, the film editor is an unsung hero of a motion picture’s creative team.\textsuperscript{42}

Nonetheless, the greatest reward for an editor is to sit amidst an audience and sense their emotional engagement with the film that he or she has cut together. Only that editor will know of the myriad small illusions they have created, much as a magician performs a repertoire of tricks. The editor will also, like the magician, enjoy the quiet satisfaction of knowing how the tricks were done, and how completely convinced was the audience. So as we shall see, it is perhaps not surprising that the word “magic” was a word used by all the editors who were interviewed for this study.\textsuperscript{43}

**EDITING THE DOCUMENTARY**

Unlike most feature films, many documentaries are not fully scripted in advance of the camera rolling. This has certainly been the case in my own practice, when in many cases the camera crew were there to film whatever might happen, rather than knowing in advance what definitely would happen. Similarly in the post-production phase, the documentary is often not assembled to a pre-determined editing plan. With most of my observational documentaries it was only after filming was completed that work began in earnest on developing a structure, a treatment and a script.

It is also usual for a documentary editor’s selection and assembly to be made from a total footage many times that of the duration of the finished film. The editor is in effect taking just ‘samples’ of the whole, samples of various and often brief durations. The choice of samples, their sequential arrangement and their temporal relationship with each other will ultimately determine the narrative structure and emotional rhythm of the finished documentary.


\textsuperscript{42} Ibid., 410

\textsuperscript{43} *Time Rhythm Magic: Conversations with Film Editors*, directed by Paul Davidson, (DVD, 22 minutes, 2013)
Sampling of course occurs in many disciplines other than the communications and documentary of this study. Choosing what, when and how to sample, and the subsequent processing of those samples is central to much quantitative and qualitative research. The proposition that documentary filmmaking depends on choosing and assembling samples of the whole, though especially true of the historical documentary, is not confined just to film. With all historical discourse, as Robert Rosenstone points out:

Omission and condensation… are integral to all forms of history, written, oral or filmed; for no matter how detailed any portrait of the past, the data included are always only a highly selected and condensed sample of what could be included on a given topic.44

In my historical documentary work, it became evident that the success of the final film was crucially dependent on which particular samples were “selected and condensed” from the whole, and the sequence and rhythm in which they were assembled. However whatever the subject, content and style adopted for diverse works, my directorial intent and editing ethos was the same for each, an intent well summarised by Ward when he wrote:

The key is for a documentary representation of historical events not to capture the exact and detailed textures of ‘what happened’ but rather to communicate the underlying contextual forces at work, and thereby achieve some explanatory power rather than simply describing.45

Explanatory power alone, however, will rarely be sufficient to engage an audience. The end purpose of all the sampling decisions, temporal manipulations, narrative cycles, creative devices and rhythmic elements that make up the finished documentary is to engage the audience—and keep them engaged for the duration of the work. It is my belief that this is what all filmmakers, documentary or otherwise, strive to achieve.

45 Ward, Documentary: The Margins of Reality, 63
THE DOCUMENTARY EDIT: MACRO-SAMPLING

We discussed above how the documentary film editor is faced with a great deal of filmed material, material which often covers a significant period of time. In many ways the editor’s footage bin (real or virtual) becomes a practical manifestation of Einstein’s fourth dimension, where “the separation between past, present and future is only an illusion.” The documentary editor may, and often does, chose footage of disparate content from widely separated time periods and process them into a cohesive whole.

In my own documentary work, I have come to describe this process as macro-sampling, whereby the available footage is contemplated as a whole and relatively small ‘samples’ are chosen from it. In doing this, the editor will firstly assess content: narrative relevance, image aesthetics, significant action and emotional impact, both within the clip itself and within the context in which it is to be placed. The editor will also contemplate the temporal aspects for each shot: what is the useful duration of the sample, how might it be re-timed, what inherent rhythm does it possess, where and when might it fit into the story? Once integrated into a finished film, the choice and sequencing of content will generally become self-evident to the viewer. In contrast, the choices, sequencing and manipulations of temporal parameters will generally remain invisible.

Consider for example, the periods of history encompassed by the submitted studio works Past Forward and Once Were Whalers. Both of these stories cover several decades of history and many chronological events of interest to a historian, sociologist or filmmaker. The significant peaks, troughs and plateaux of periods such as these might be represented on a historical timeline as illustrated:

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**Figure 1** Basic Historical Timeline

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The period of interest represented by the horizontal time-base is years and the events of the period may be described on the vertical scale, with different amplitudes related to their perceived significance. It might be the story of a film school, the whaling industry, or indeed any other story with the typical peaks and troughs of life. The historian or filmmaker contemplating such a story will choose samples from the timeline, the timing and width of each sample varying with significance, content or intent.

**Figure 2  Sampling the Timeline**

The selected samples from the raw footage (illustrated as vertical blue lines) will then be viewed, assessed, analysed, processed, weighted and catalogued. They will be placed into context amongst many like samples and other elements, so that gradually a number of assembled sequences of various durations emerge.

**Figure 3  Sample Assessment and Assembly into Sequences**
Finally the sequences are assembled and output in a coherent sequential form dependent on narrative relevance and film-maker intent; the story is re-created from the chosen samples in a greatly condensed form:

**Figure 4** Assembly and Transmission - completed Film

This macro-sampling process of choice, assessment and assembly into a coherent representation certainly is central to my own practice. I believe it occurs in much documentary editing, though it may not necessarily be described as such.

It is also in the her-stories and his-stories of ordinary people, rather than great events and famous persons, where this macro-sampling finds greatest application. The actuality of these stories may be drawn-out, subjective, unreliable, complicated, disjointed and confusing, but the film of such a story must have structure and order. It must also have a narrative arc of some coherence if it is to effectively engage an audience. Though some of these things will be found in the everyday life of everyday people, the filmed story can inevitably only capture fragments from the flow of their physical, social and human reality.

These ‘fragments of the whole’ for the documentary editor may be compared with the fragments of memory that a popular poet, well before the advent of cinema, called his ‘spots of time’:

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There are in our existence spots of time
With which distinct pre-eminence retain
A vivifying virtue, whence, depressed
By false opinion and contentious thought,
Or aught of heavier or more deadly weight
In trivial occupations and the round
Of ordinary intercourse, our minds
Are nourished and invisibly repaired.

—William Wordsworth
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Wordsworth is reflecting that the memories of special moments in one’s life can be energising and nourishing, inspiring a will to carry on when embraced by tough times or dark thoughts. The documentary editor also seeks out ‘spots of time’, slices of the whole which when re-assembled might convey with fidelity and integrity the

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essence of that whole, as an artful but honest re-presentation of actuality. As other editors and theorists suggest:

Filming real life is a constant struggle to distil reality into a meaningful subset of itself—into the telling moments, the telling gestures, the lines of dialogue that will suggest the rest of the scene without having to see the rest of the scene.

—Steve Ascher⁴⁸

There is another sense of the craft of editing that is like weaving. Shots, then sequences, are inter-mixed to contrast and blend with each other and build a whole that is stronger than the sum of its parts… Contrasting one story thread against another, paralleling others, while creating a world that is coherent, consistent, seductive, and surprising, this is the editor as dreamweaver.

—Julie Janata⁴⁹

Documentary film is thus, always was, and ever will be, intrinsically linked to issues of realism and realistic representation… the preservation and perpetuation of moments of everyday life which would otherwise be doomed to fade into darkness within the ever-changing flux of perceptual experience.

—Ian Aitken⁵⁰

Stories from the ever-changing flux however, inevitably require some sort of subjective editorialising to be accessible on screen. Whether this is done with creativity, fidelity and integrity is entirely dependent on the ethos and intent of the documentary maker.

THE DOCUMENTARY EDIT: MICRO-SAMPLING

Let us now consider the next stage of the documentary edit. After usually a great deal of macro-sampling and contemplation of the content, the editor has assembled a draft structure and some reasonably cohesive sequences. The samples, or ‘clips’ chosen to this point will be rich in relevant content, and to a lesser extent, determined by their temporal parameters of duration and rhythm. Now a further sampling process occurs, which in my own practice I describe as micro-sampling.

Unlike the macro-sampling, which selects from a large amount of raw material, micro-sampling focuses on individual sequences. The aim is to extract the essence of these sequences, maintaining integrity of content, but manipulating the temporal elements of duration, context and rhythm to maximise the cohesion, flow and emotional impact of the finished sequence. The micro-sampling process is much less visible than the earlier macro-sampling, but it is micro-sampling that constructs the

⁴⁸ Steve Ascher, quoted in Bernard, Documentary Storytelling, 69
⁴⁹ Julie Janata, Transitions, 202
subtle rhythms and resonances which largely determine the emotional arc of the story and maximise viewer engagement.

The submitted studio works, as with all my documentaries, were constructed with a great deal of both macro- and micro-sampling. In particular the films *Past Forward* and *Once Were Whalers* required a great deal of both, and as a practical example of the micro-sampling process, we shall refer to an example found at 18min10sec in the finished *Once Were Whalers*. The development of digital editing software, and the universal use of visual ‘timelines’ as the basis of all current video and audio editing, allows us to consider a simplified graphic description of the micro-sampling process.

**MICRO-SAMPLING: The Tommy Norton Interview**

Tommy Norton is a former whale gunner, now forty years retired, and was interviewed about his experiences as part of the documentary work *Once Were Whalers*. Using the usual timeline convention of video content in frames above the related audio waveform, Tommy’s description of his introduction to a whaling career can be set out thus:

"Yeah I can remember the first opportunity I had a job, ah Mr Gilly Perano… asked me whether I would like to go whaling, well going back a little bit prior to that… my first forebear Patrick arrived here around about 1827…1829 and ah… from there on in they were involved in whaling I was the… one two… I don’t know, fourth or fifth generation… there was Patrick… ah Dad’s father, Dad’s… I was a fourth generation… whaler and of course ah… it was always in our blood and ah… there was a retirement Max Kenny retired at the time and ah… and Gilly came and asked me whether I’d like to go on the hill because I think Sid Thoms also retired the same year but ah… even though I was very keen I didn’t want to look behind glasses all the time and I I said no… a fortnight after that he asked me whether I’d like to go on the gun well that was different altogether yeah… so that’s where I ended up."

Tommy’s description of how he became involved in the industry is typical of many people responding to an interviewer’s questioning. It is conversational, somewhat disjointed, a little hesitant, and sprinkled with incomplete phrases, non-sequiturs and a number of ums and ahs as he searches for the next few words. In other words, it is ordinary phraseology from an ordinary person, and is exactly as may be heard around many a dinner table or pub lounge. It is in fact how most people communicate in a live situation.

However when the same conversation is remediated and presented in a televsual format, these characteristics, unnoticeable in normal conversation, become less transparent to the viewer. Television time passes differently to real time, and should Tommy’s response be presented in its full un-edited form, it would almost certainly slow the narrative and frustrate the viewer.
The editing process can thus be thought of as a form of sampling, whereby just segments of a sequence are selected, then re-assembled into a more concise essence of the whole. In this case, discrete samples from the full Tommy interview clip are taken thus:

**Figure 6** Sampled Clip

"I can remember the first opportunity I had a job" "Mr Gilly Perano" "asked me whether I would like to go whaling" "well going back a little bit" "my first forebear Patrick" "arrived here" "around about 1827" "and" "from there on in they were involved in whaling I was the... one two... I don't know, fourth or fifth generation... there was Patrick... ah Dad's father, Dad's... I was a fourth generation... whaler and of course ah... it was always in our blood and" "Gilly came and asked me whether I'd like to go on the hill" "but" "even though I was very keen I didn't want to look behind glasses all the time and I" "said no" "A fortnight after that he asked me whether I'd like to go on the gun well that was different altogether" "so that's where I ended up."

The choice of samples is dictated by both the narrative contribution and emotional value of the content. The samples must cohere into a sensible narrative, but often how something is said is more significant than simply what is being said. This explains the choice of the largest central sample from the Tommy clip, in which he ponders whether he is a fourth or fifth generation whaler. Although his delivery is interspersed with pauses, his facial expressions and hand gestures convey some of Tommy's thoughtfulness and character, encouraging a deeper empathic connection with the viewer.

The gaps are then eliminated and the samples coalesced into a new whole. It is usual to add appropriate audio processing at the joins to ensure the essence of the original conversation is maintained, but no audible evidence of editing is discernible:

**Figure 7** Compressed Clip

The audio component of the new clip is now a re-presentation of the original, but it is almost a third shorter and significantly more rhythmic and cohesive. However there is now a problem with the visual content. Whereas a skilful audio cut may be completely inaudible to the audience, the corresponding video edits produce obvious and disconcerting 'jump-cuts'. Except in very special circumstances these jump-cuts are unacceptable and the visual part of the sampled clips must be removed:
A common method to replace the removed video component is to add visual material which directly or indirectly supports the now concise audio content. In this case some relevant material was available from footage of both present-day whale-spotting and earlier archival footage. Adding this material completes the process of sampling and re-assembly, and delivers a concise, cohesive and engaging first-person interview sequence:

"I can remember the first opportunity I had a job, Mr Gilly Perano asked me whether I would like to go whaling. Well going back a little bit my first forebear Patrick arrived here around about 1827 and from there on in they were involved in whaling. I was the… one two, I don’t know, fourth or fifth generation. There was Patrick, Dad’s father, Dad’s… I was a fourth generation whaler and of course it was always in our blood. Gilly came and asked me whether I’d like to go on the hill but even though I was very keen I didn’t want to look behind glasses all the time and I said no. A fortnight after that he asked me whether I’d like to go on the gun, well that was different altogether. So that’s where I ended up.”

Note that the micro-sampling process involves much smaller elements of time, measured in seconds and frames, than the macro-sampling performed earlier in the editing process, where we are dealing in minutes, chosen from hours of footage.

To assess the process in a more quantitative manner, the documentary *Once Were Whalers* has a finished duration of 30 minutes. In its making, interviews of various durations were conducted with eight different whale-spotting participants, providing some two hours of raw footage. In addition just under three hours of archival footage was sourced, and more than twelve hours of new whale-spotting footage was filmed over a period of time.

The macro-sampling process reduced this to a draft first cut of approximately 50 minutes. The subsequent micro-sampling maintained the essence of the story but invisibly manipulated time to achieve the final duration. In assembling the final film, a total of 124 micro-samples were extracted from the chosen interview clips and re-assembled into cohesive sequences similar to the Tommy interview illustrated above. I would suggest that most, if not all, of these time manipulations are invisible to the
viewer, who nonetheless emotionally engages with, and accepts as truthful narrative, this “creative non-fiction on screen.”

The sampled and re-assembled sequence\textsuperscript{51} is clearly only a re-presentation of the original, but the fact that it is an artificial construct is invisible and inaudible to all but the most discerning viewer. Both content and time have been manipulated, and the fact that this is undetectable, even by the original interviewee, suggests we again reference Grierson’s “creative interpretation of actuality”. I suggest that in the sampling process above, we are indeed interpreting the actuality of Tommy’s words by reducing them to their essence. It is in this creative interpretation that a written work differs so much from the televisual equivalent. In the former, any such interpretation might raise issues of ethics, integrity and truth; at the least, a serious academic paper would necessarily indicate by the use of ellipses (…) that the original words have been significantly edited.

In contrast, no such indication is ever used in the televisual equivalent. The sampled sequence is presented as an integrated whole, with a strong suggestion to the viewer that within the context in which it is presented, it is not just the truth, it is the \textit{whole} truth. The choice, duration, order and re-assembly of the samples is invisible to the viewer, who is privy only to the presented finality. In \textit{Once Were Whalers} the audience views a re-presented interview with Tommy which strongly invites acceptance as ‘truth’, or at the very least ‘truthful’. The real truth is that \textit{Tommy never said} that which is presented, and neither the audience—nor Tommy himself—will ever be any the wiser. A convincing illusion has been created, the mechanism of which is entirely invisible to the audience. In this respect I suggest the editor’s craft is similar to the magician’s, who also creates convincing illusions without ever revealing the mechanisms. Which perhaps explains why so many editors describe what happens in their suites as ‘magic’.

\textbf{WHAT A DIFFERENCE A FRAME MAKES}

Even at the smallest possible increment of adjustment, the editor’s sampling and manipulation of time may still have a significant impact on the outcome, but be equally invisible to the audience. Conventional cinema presents its illusion to the audience at twenty four still images, or ‘frames’, each second.\textsuperscript{52} Those frames are laid out sequentially to make up a ‘shot’, the shots are assembled into ‘scenes’, and an assemblage of scenes becomes the ‘film’. Until recently this was a literal and physical process of cutting and joining on the editing bench. The mechanical apparatus of

\textsuperscript{51} The edited sequence appears in \textit{Once Were Whalers}: 10min 10sec

\textsuperscript{52} 24 frames per second is the long-established standard cinema rate. Television frame rates vary in different countries but are usually 25 or 30 frames per second. Various special frame rates are also used.
traditional editing has given way to electronic digital systems, but the frame, even in its virtual digital form, remains the basic time unit of film.

It follows that the briefest possible shot in a film is of one frame duration, normally one twenty-fourth of a second. Conversely, the longest possible shot is theoretically the length of the finished film—perhaps an hour or more. However, films such as Russian Ark, a historical drama comprised of just one shot are, thankfully for the editing profession, extremely rare.53

At one twenty-fourth of a second, a frame exists for a very short period of time. A human blink, for example, typically occupies the time of six frames, so even the phrase that editor Walter Murch chose as the title of his insightful book on editing—In the Blink of an Eye 54—does not reflect how quickly things can happen in film. One-sixth of the time it takes to blink would hardly be perceived in real life—so can it be perceived in film?

**Figure 10** The six-frame blink

Over the course of much editing it has become clear to me that the duration of one frame is close to the threshold of the human eye’s ability to perceive. Nonetheless, if one incorrect frame remains, by accident or design, in an otherwise contiguous edited sequence, it jumps out as a clear discontinuity, a signal that something is wrong and needs to be fixed. As editor Mike Horton says, “When you’re down in that area of twenty-fourths, sometimes they beat your eye, and sometimes they bang!”55

However, at least half the people who visit my edit suite cannot see that discontinuity, no matter how many times they view the sequence. It is clear that the length of time that one frame occupies is close to the liminal point of human visual perception. The fact that editors can see this when others cannot is a puzzle for which I can only suggest two possible conclusions. Either the rods and cones of some eyeballs have a naturally faster response than those of others, or the lengthy and repetitive screen-watching that editors endure trains and improves their eyes’ performance accordingly. I favour the latter explanation.

53 Russian Ark, directed by Alexander Sokurov. Film, 96 minutes (Seville Pictures: released 22nd May 2002)
55 Time Rhythm Magic, Davidson, 2013
It is also clear to me that the success of a cut, and the degree to which it ‘works’, is very often determined to a one-frame precision. Such tiny ‘spots of time’ go completely unnoticed in our living human reality, so it is again something of a puzzle that they can be crucial to an audiovisual re-presentation of that reality.

Why this should be so, is not a question for this study. Whether it is so is more relevant, and the question was put to experienced editors. Their response was surprisingly unanimous—one frame can make a huge difference as to whether or not a cut works.

The editors’ responses are presented fully in the film *Time Rhythm Magic* which forms part of this submission. It is timely to consider some extracts here:

I’ve thought a lot about one tiny frame, because so often it has made the difference. It’s made the difference between energy flowing forward, and energy stopping. And one frame will make the difference.

—Annie Collins

Timing is huge. As they say in comedy, timing is everything. So one aspect of timing is choosing precisely which frame, and I have frequently found in the edit suite that you can change the meaning of a gesture completely with one frame.

—Karen Pearlman

It tends to be a relative judgement, and they’re the easiest to make. So it’s better or worse, when you’re down in that area of twenty-fourths.

—Mike Horton

One frame is extremely important. Whenever I teach I always say to my students “Watch out for the one frame difference.”

—Mary Stephen

At 24 pictures a second, you don’t see, but you *feel* it’s something wrong. So every frame is important. I learnt that very early.

—Sylvia Ingemarsdotter

The depth of analysis may vary, but all the interviewees, and I believe the vast majority of editors, are unanimous in their appreciation of the difference that one frame can make. The difference between a cut that works and a cut that doesn’t may well be explainable as a consequence of applied gestalt, the phi phenomenon, a quirk of human psychology, a physiological limen, or some combination of all these things. I expect most editors prefer to just accept what their acclaimed colleague Murch says when he reflects, “Perhaps it is kind of like the bumble-bee, which should not be able to fly, but does.”

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56 All editor comments here from *Time Rhythm Magic*, Davidson, 2013

57 First defined by Max Wertheimer in 1912, the Phi Phenomenon is an autokinetic effect that makes two stationary but fluctuating lights appear under certain conditions to be one moving light.

58 Murch, *In the Blink of an Eye*, 9
In summary, one twenty-fourth of a second is such a brief flicker of time that it should not make a difference to anything: in film editing, it certainly does. Knowing this, and more importantly, being able to feel this, is a gift to any editor, for whom time is the glue that binds the other filmic elements together.

**SUMMARY**

Chapter Three has been principally concerned with the first and third propositions of the study. Firstly, that the process of documentary editing involves various levels of sampling from a whole; and secondly, that much of this sampling is invisible to the viewer, who is presented with an illusion of reality often accepted as truth. I submit that the discussion and examples of the chapter provide significant illustration and validation of those two propositions.
Chapter Four

TIME and THE TELEPHONE

To communicate is the beginning of understanding.
—Bell Telephone Laboratories

The second proposition of the study compares and relates sampling in editing to sampling in telecommunications. In the course of my professional practice in both disciplines, I have noted that key analogies exist between the documentary construction process described above, and the process by which digital communication systems transmit and re-present information streams. These outwardly disparate disciplines are linked by their key parameters—time and sampling. In this chapter we shall discuss the significance of these parameters in digital communications systems, and explore the nature and relevance of the sampling analogies.

SHARING TIME AND SPACE

We noted earlier that the mechanism of cinema arrived as a parallel development. This is no surprise, as the latter part of the nineteenth century was a time when new inventions and discoveries were bursting forth everywhere, even as hardship or ambition took millions from the old world and spread them across the globe.

Among those who travelled from the old world to the new was Scottish scientist Alexander Graham Bell, who settled in Boston USA. His most famous words, spoken on March 10, 1876, are hardly the oratorical equivalent of other famous addresses, but “Watson, come here. I want to see you.” were the first words ever spoken on his new invention—the telephone.59

Thomas Watson was only in a nearby room that day, but a few months later Bell again spoke to him over a two-mile wire stretched between Boston and Cambridge, Massachusetts. Here was another leap of distance, a reduction of the geographical gap between the persons speaking. Although far apart, two persons could now converse with the intimacy of a normal drawing room conversation. Bell’s new machinery was creating tricks of perception that paralleled those that the visual mechanisms of Marey and the Lumiere brothers produced.

59 Bell named his device from the Greek words ‘tēlē’, meaning far, and ‘phōnē’, meaning voice, and thus gave us the means to hear ‘far away voices’.
Film editing can similarly shatter spatial and temporal absolutes, as with a simple ‘cut’ the viewer may be instantly propelled to a new place or time. In doing this, the editor shares much with the communications engineer. In the words of Tom Gunning:

The spatial disjunction of the edit in early film borrows from the logics of other new technologies of the period, such as the telephone and the telegraph, technologies that connect discontiguous space without travelling the distance. The combination of intimacy and distance common to other technologies resurfaces in the editing of filmic space.\(^{60}\)

For Gunning, the ability of telecommunication devices to let us communicate over vast distances without actually having to travel that distance is mirrored in the ability of the film editor, using the cut, to shift us instantly in both time and space. Aparna Sharma agrees when he describes the juxtaposition of montage in film editing as having the ability to:

- span vast spaces and times, to compress and condense durations within narrative, to combine varied elements for suggesting connections and rearranging understandings of subjects.\(^{61}\)

As we saw in the previous chapter, much temporal manipulation in editing is invisible, but it nonetheless lies at the heart of the process. Reflecting on Gunning’s words about the parallels between filmic space and the telephone, it is perhaps no surprise to find that communications engineers also trick our perceptions of time with very persuasive illusions. And just like the best editors, and the best magicians, the illusions of the engineer are so convincing that no one realises there has been a trick at all!

**THE GREAT TIME-SHARING TRICK**

One of my early film works was an educational video for Telecom New Zealand, the purpose of which was to explain in simple terms how the new digital switching systems then being introduced actually worked. The scenarios developed for that film successfully engaged and informed the target audience, and relevant parts of the content are summarised here:

(adapted from *Doing it Digital*, 1986)\(^{62}\)

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\(^{60}\) Tom Gunning, “Heard Over the Phone – the lonely villa and the delorde tradition of the Terrors of Technology”, *Screen*, Vol 32, No 2, 184


\(^{62}\) Doing It Digital, written and directed by Paul Davidson. Video, 18 minutes (Wellington NZ: Telecom, 1986)
NARRATOR: “Alexander Graham Bell invented the telephone in 1876, but until he invented the second one it was not much use. Connecting those two telephones by a pair of copper wires enabled two people to converse quite naturally, though a great distance apart, and provided the genesis of the global village.

“The problem was: every pair of talkers needs a separate pair of copper wires connecting them—and them alone. By the middle of the twentieth century, all the copper in the world could not provide the wires needed to meet the demand for telecommunications. Multiple users clearly couldn’t be on the same line at the same time—but could that same time somehow be sliced up and shared amongst them?

“The challenge for the scientists and engineers was to take that telephone discussion, or any other stream of information, and process it into a new form able to be transmitted to a distant location and reassembled as a coherent and faithful reproduction of the original.”

In meeting that challenge, telecommunications made a breath-taking shift from the physical domain (a copper wire for everyone) to the time domain (a slice of time for all). What made this, and ultimately our entire digital world possible, was an invention called Pulse Code Modulation—PCM. This revolutionary idea from the somewhat eccentric British engineer Alec Reeves shifted telecommunications from the physical domain of circuits and switches, to the time domain, where time becomes a digital commodity to be sampled, sliced and shared around.

PCM transformed the copper wire-based telephony of the time, and remains the basis of all modern communication systems: if we listen to a CD, search the internet, use a GPS navigator or make a phone call, we are using PCM. The telephone has long been a universal device, taken for granted even in its more recent ‘smart’ forms. But very few telephone users appreciate how they are participants in a most convincing temporal illusion, which we here illustrate in its most basic form:

Figure 11 Telephone time-sharing

Imagine two persons having a conversation along a typical hard-wired telephone line:


Now suppose we insert a simple switch in the line and begin flicking it back and forth. It is easy to envisage the result. The sound would cut in and out in a staccato effect, creating gaps in the conversation making it difficult to understand:

But if we gradually *increase the speed* of switching, the gaps in the conversation will become less and less. Eventually, when the switching happens fast enough, the gaps become imperceptible and the conversation is perfectly clear once again. But even though the conversation is now just as clear as it was when there was no switch at all—the circuit is now in use for only half of the time.

**Figure 12** Time-sharing cont

If we now put another switch in the circuit and switch both of them rapidly—and in sync with each other—we can connect two other callers to the same line:

As long as the switching is fast enough and stays in sync, all the parties get perfect individual service, unaware that their actual time on the line is only *half what they perceive.*

This rather neat time-sharing trick, multiplied many times over, is the basis of Pulse Code Modulation (PCM), Time Division Multiplexing (TDM), and our whole digital society. The engineer slices up time and re-presents it as reality in a simple but persuasive example of time-based illusion.

Now we shall look in more detail at time in telecommunications, in particular the sampling, processing and time-sharing processes of Pulse Code Modulation systems, and examine the parallels that exist with the nominally disparate practice of documentary film editing.
A PCM PRIMER

Most people nowadays are familiar with the visual representation of an audio signal, such as might be generated by speaking into a telephone handset or microphone; the modern digital film editor or sound designer certainly is. Consider this example of a simple voice phrase and its resultant electrical waveform:

![Figure 13 Typical Audio Waveform](image1)

This generally familiar shape is a symmetrical waveform which peaks at the loudest parts of the voice and goes to a minimum when the speaker pauses. Note that this is a smoothly varying ‘analogue’ waveform—in other words an electrical analogy of the sound waves in the air that created it. The height of the wave represents the loudness of the voice, and the density of the waves within it represents the pitch, or ‘frequency’.

Firstly, we shall simplify the waveform a little by tracing out just the changing amplitude (technical term for ‘volume’) as the sound level varies. The waveform is symmetrically positive and negative, so for the purposes of this explanation, just the positive component will be illustrated:

![Figure 14 Positive Peak Amplitude Levels](image2)

The heavy black line now shows the analogue amplitude, or loudness, of the waveform, typically measured in Volume Units (VU) or decibels (dB)
Now we take just a *sample* of that amplitude at regular intervals (vertical red lines):

![Figure 15 Sampling of Audio signal](image)

Each sample (vertical red line) will be a different height depending on the amplitude of the signal at that point. So when the volume is loud, the sample is bigger; conversely when everything is quiet, the sample will be small, or even zero.

Clearly samples must be taken at sufficient intervals to capture a realistic representation of the complete waveform and properly re-construct it as required. It is fairly self-evident that samples must thus be taken quite close together in time. Note however, that the actual *duration* of each sample can be very brief.

Now each sample is ‘quantized’—given a numerical value related to its amplitude. In voice telephone systems the minimum value is zero and the maximum is 255, so we have the makings of a basic analogue-to-digital converter with 256 levels of precision.

![Figure 16 Sample Quantization](image)

At this stage the part of the signal that in its original analogue form looked like this:

now looks like this:
Even though the samples must be taken frequently to accurately capture the waveform shape, the very short duration of each sample means that the time space between each can be used to sample several completely separate audio waveforms at the same time. In essence, in an extension of the ‘great time-sharing trick’; the same piece of time is being sliced and sampled into discrete pieces, which are allocated to different users.

The process continues with each sample then encoded into a ‘packet’ of binary pulses (bits), the structure of each packet being related to the size of the sample. Typical communication systems use packets of eight binary bits,\(^{65}\) sufficient to encode 256 discrete levels:

\[ 00111001 \quad 01101011 \quad 11111111 \quad 01010110 \]

65 Binary, from the word ‘bi’ (two) means the pulses (‘bits’) can only be one of two states - On or Off. A group of eight such bits provides \(2^8\) possible levels; that is, 256 levels in a range from 0 to 255 inclusive. The entire digital world now operates in binary code, though much earlier binary communication systems include Semaphore (two flags) and Morse Code (dot or dash).
The original analogue audio waveform, which may have had the complexity and beauty of a symphony orchestra, has been reduced to a stream of consecutive pulses, each pulse having the simplicity of a light switch—either ‘off’ or ‘on’. Such is the reductive power of Reeve’s remarkable invention, even though when he patented the idea in 1938 there was no technology capable of actually doing it. As Reeves himself reflected in 1965:

Pulse Code Modulation is a good example of an invention that came too early. When PCM was patented in 1938, I knew that no tools then existed that could make it economic for general civilian use. It is only in the last few years, in this semiconductor age, that its commercial value has begun to be felt.66

But at the same time, when Reeves predicted:

In my view therefore, by AD 2000, PCM in some form will be the very backbone of the world’s communication systems.67

he got it absolutely right.

**ANALOGY and INTEGRITY**

The second proposition of the study is that useful analogies exist between the sampling and re-assembly process in documentary editing and the sampling, encoding and re-assembly inherent in digital telecommunication systems.

It is clear from the discussion and illustrations of the previous chapters that analogies exist. In both cases, samples are chosen from a whole, the samples are evaluated, processed and assembled as sequences, and the sequences coalesced into a reductive representation of the whole. In telecommunications, the outcome is a reassembled conversation; in documentary, the outcome is a story. The principal difference is in the sampling mechanisms. In communications systems, the sampling occurs very quickly and precisely, controlled by mathematically determined algorithms and electronic mechanisms. Compared with these systems, the sampling of the editor is extremely slow and imprecise. Furthermore, the editor’s sampling is never a function of precise algorithms, but the result of a complex amalgam of cognitive, organic and emotional responses, which are further discussed in Chapter Five. Nonetheless, it is clear that analogies exist—but is there any usefulness to a documentary editor available within those analogies?

In maintaining the quality of their PCM-driven systems, communication engineers study the equations of information technology and sampling theory, and implement


67 Ibid., 63
practical techniques to ensure the digital integrity of their networks. A large number of parameters are monitored to ensure this is the case, including:

- **Sample Width**: what, and how much should be selected from the original?
- **Sampling Rate**: when, and how often, should the samples be taken?
- **Quantisation**: with what degree of precision must each sample be measured?
- **Weighting**: what relative significance might be placed on each sample?
- **Encoding**: how should the samples be assembled into coherent packages?
- **Error Rate**: what errors occur and what effect will they have on the output?
- **Distortion**: how different is the final signal from the original?
- **Bias**: does the signal have an underlying positive or negative energy?
- **Noise**: will the message be masked by non-useful static or interference?
- **Decoding**: will the final output be a faithful re-presentation of the input?

Surprisingly all these qualitative parameters, important in their communications context, are also parameters which can be interpreted in terms relevant in a documentary film context. With a typical historical timeline for example, the story decisions made may well be influenced by:

- **Sample Width**: what parts of the story are we concentrating on?
- **Sampling Rate**: are we taking enough samples to complete the overall story?
- **Quantisation**: how much precise detail are we able we include?
- **Weighting**: where are the tensions and releases in the narrative arc?
- **Encoding**: in what order should the parts of the story be told?
- **Error Rate**: what level of validation do we need on the factual content?
- **Distortion**: are we altering the truth to suit the story?
- **Bias**: is the telling of the story influenced by an editorial agenda?
- **Noise**: is the story confusing because of unnecessary content?
- **Decoding**: will the final story be a credible re-presentation of the reality?

Considering this re-interpretation of parameters more usually thought of as exclusive to telecommunications, I believe that making a deliberate and routine evaluation of them in the editing environment is a useful discipline that provides the editor with a more objective measure of the balance, truth and integrity of their re-presented screen story. This has certainly been the case in my own practice. In no way is it suggested that the editing process can be codified and automated in any way similar to a data process. However the discipline that a routine consideration of these parameters brings to an otherwise iterative and organic decision-making process can only be of benefit.
SAMPLING HISTORY

Much of the above processing was incorporated into the making of another of the studio works forming part of this study – *Past Forward*. This is another historical documentary with a time span of one hundred and thirty years, and in essence is the history of a building constructed in South Brisbane in 1880. As with most films however, it is people, lives and relationships that enrich a story. The story of a building thus became the story of its diverse usage over the years, the people connected with it, and its geographical and historical context in the community that surrounds it.

Adopting the historical timeline analogy discussed earlier, the history of the building (which currently houses the Griffith Film School) can be graphically illustrated thus:

![Building History Timeline](image)

Research for the film revealed that the fortunes of the building had paralleled the fortunes of its South Brisbane neighbourhood, through periods of prosperity, hardship and decay, until its eventual refurbishment and establishment as the Griffith Film School. Although a historian may record history in a uniform chronological sequence, the filmmaker’s choice of time and event is determined by irregular samples, weighted and biased by considerations other than chronology.

In research for my own documentaries of this type, I especially seek two things—visual material, in the form of archival film footage, photographs, newspaper files and the like, and personal connections, people with a direct connection to past aspects of the story who are able to put a human face to a past story. This understandable focus in seeking material to tell a good visual story is also a good reason to routinely consider the sampling parameters listed above. In this way undue weighting, noise, bias, distortion and the like can be identified. This does not mean that identification necessarily means elimination—but the process definitely means that editing decisions are made with better knowledge and optimum judgement.
Consider then a graphical depiction of the sampling and selection process for *Past Forward*:

**Figure 21** Sampling and Selection

The blue vertical lines represent the macro-samples taken from the overall story. Their horizontal position indicates the chronological time they refer to, and their horizontal width is a measure of the amount of content selected from that period, and the weighting given to it.

For example, it can be seen that a significant weighting was given to the building extension and the Richard Randall Gallery events of the early twentieth century. In both cases some interesting photographs and paintings were available to illustrate the story, but the most significant factor was that both events were able to be linked directly to the present. The architect who designed the 1902 building extension was the great-grandfather of the architect of the 2006 film school conversion. The great-niece of artist Richard Randall was available to directly contribute information, anecdotes and original paintings of the artist himself. In terms of their historical significance, the extension and the Randall phase are relatively brief and unimportant. But the editor’s choices reveal a clear bias towards personal connection at the expense of historical balance. Such connections and testimonies contribute greatly to keeping the documentary a warm and engaging human story rather than a recitation of historic facts.

A relatively wide sample was also taken through the 1920’s when the building was a popular dance hall. In this case a visual bias swayed the editor’s decisions, there being a rich and interesting catalogue of photographs of the time available. In addition, as the dance hall later became a modern sound stage for the new film school, there was an opportunity to link past and present in an interesting and creative manner.\(^{68}\)

\(^{68}\) The green-screen dance hall sequence that links past and present: *Past Forward*, 9min 10 sec
Clearly the editor is entitled to make judgements and selections based on other than a strict historical chronology—it is a film being made, rather than a book being written. But in accepting any such disproportionate sample widths, weightings and bias in pursuit of a creative and engaging film story, the editor should also take care that any resultant noise, error rates, distortion or faulty encoding does not prejudice the fidelity and integrity of the final story—especially in documentary.

Similar considerations influenced many of the macro-sampling choices made from the lengthy historic timeline and copious research material available. The editing process also featured much invisible micro-sampling, as previously discussed in relation to *Once Were Whalers* (Chapter Three).

The inter-relationship of past and present was a principal theme for the film. It was pre-visualised in scripting and choice of filming locations, and artfully realised in various post-production manipulations, making good use of the power that Aparna Sharma previously described:

> Film editing has the ability to span vast spaces and times, to compress and condense durations within narrative, to combine varied elements for suggesting connections and rearranging understandings of subjects.69

I believe the finished film is an excellent manifestation of these words. Its communication objectives were to engage, entertain and inform a general audience. By judicious sampling of the data, creative leaps in time and space and the synergy of multiple rhythmic elements, I believe those objectives have been met in a successful documentary work.

**SUMMARY**

This chapter has been principally concerned with the second proposition of the study, which suggests that the sampling principles and processes that concern communications engineers are analogous to the principles and processes that concern documentary filmmakers. The principles of time-sharing and time-sampling in communication systems have been illustrated, and compared with similar processes in editing. Similarities and differences have been examined, and the alternate meaning of qualitative parameters in each discipline compared, parameters that might be usefully applied in the documentary editing process. The parallels might be considered surprising in such nominally disparate disciplines, but perhaps not when we consider that both engineer and documentary maker work with the same *raison d’être*—a wish to communicate.

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RHYTHM and EDITING

What is editing? You take the end of a strip of film and then you paste it to the end of another strip of film. Then you put it into a machine where light goes through it onto a screen and you look at it and then you cry.
—Alfred Hitchcock

SUITE RHYTHMS

The fourth proposition of the study argues that film editing is a highly iterative process, and that editing decisions are determined by a complex combination of cognitive, emotional and organic resonances within the editor. That it is an iterative process will be self-evident to anyone who has ever been in an edit suite. A cut is made, the sequence is viewed, the result is assessed, the cut is adjusted and the cycle repeats over and over until a final editing decision is reached. Then the process is repeated for the next cut, until the many hundred cuts in a typical film are each individually optimised.

In my practice I have found that finding that optimum cut is indeed a complex combination of cognitive, emotional and organic resonances. Content, aesthetics, context and story all affect the decision-making, but the single most significant element is rhythm.

Rhythm and duration are a direct sub-set of time, and inverted inseparable twins of each other. Duration measures how long a single event takes, and is more deeply embedded in life than rhythm; we accept the duration of a day to be twenty four hours, of a film perhaps two hours, of a life some seventy years or so. Rhythm is more subtle, but equally definable and quantifiable. Rhythm considers a specific event or action, and measures how often that event occurs in a fixed interval of time.

The result may be a rhythm of magnitude ranging from the smallest to the largest imaginable. There are rhythms of a galactic scale—the moon makes one revolution per month around the earth, the earth makes one revolution per year around the sun. There are also rhythms of more human scale, the most fundamental being the muscular contraction of the heart, squeezing a pulse of blood into our arteries seventy two times per minute.

Rhythm is also the life blood of musicians and dancers, who are driven by events they call ‘beats’ and intervals they call ‘bars’. The pace of a song or a dance will be described as so many beats per minute, and the counting of those beats defines its rhythm. But beyond the implied homogeneity and synchronicity thus implied, rhythm also embodies a huge emotional component with an ability to resonate, stimulate, energise and intoxicate in a psychological and physiological effect that human beings almost universally describe as ‘feeling’ the rhythm.
Scientists and engineers also measure rhythm, but they call it ‘frequency’. The events or actions they study, just like music, occur regularly in measurable form. That measure is very often no more complex than the number of times something occurs in one second of time, or ‘cycles per second’. This fundamental measure of scientific rhythm was named a ‘Hertz’ in honour of the German physicist who deeply explored it, in the same late nineteenth century period of discovery that produced the cinema and telephone.  

Rhythm is also at the heart of film editing. The editor shapes the chronological and emotional rhythms of the film by timing, pacing and phrasing techniques analogous to choreography or music composition. In music, dance and cinema alike, rhythm’s physiological and psychological effects on the participant can be experienced as a deep and visceral stimulation. The human pulse is itself a tiny fluctuation of tension in a series of pressures and releases, cycling regularly in much the same manner as the measures of musical rhythm (a four-beat bar, for example) combines ‘beat’ and ‘not beat’ into patterns.

In my initial days as an editor in the early eighties, I read the few books on editing that were available at the time. Most of them concentrated on the technology and techniques of the craft, explaining what ‘in’ and ‘out’ points were, how to mix shot sizes for smooth cuts, where eyes should be looking in successive clips, the use (and misuse) of the cutaway and so on. They also told me that the greatest editing sin of all was to ‘cross the line’, and if all else failed when a cut wouldn’t work, the advice was, “If you can’t solve it—dissolve it.”

Having knowledge about film editing, however, is not the same as being an editor. The difference was something that could not be learned by reading. Like music, it could only be learned by doing and feeling. It was the rhythm of editing.

It became clear that my editing endeavours were not that much different from the musician’s quest to fuse vocal, chromatic, timbrel and rhythmic elements into a cohesive—and often highly emotional—experience. The same principles applied, but the players were different. The ‘players’ in the edit suite were not musicians, rather they were the individual visual and aural elements that at any point, or in any sequence, had to ‘play’ together to create an emotional synergy that was something different, and greater, than the sum of their individual parts. The editor’s task, like the conductor of an orchestra, was to get those parts working together in a cohesive composition. Manipulating diverse timings and rhythms provide the pathway to achieving this. Editor Julie Janata succinctly summarises this:

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70 Dr Heinrich Hertz. The term ‘hertz’ is now used instead of ‘cycles per second’ and has come into common usage. For example a computer with a 10 Megahertz processor runs at 10 million cycles per second.
Film editing is the art of combining images, dialogue, sound and music to develop characters and build a story. Those images and sounds have movement and pace, colour and emotional tone that in the best case, when skilfully arranged, create a synergy of storytelling elements. Editing is like conducting music when it propels a story, with the rhythm of the cuts enhancing the rhythms of dialogue and movement within the shots.\(^71\)

Filmmakers often talk of making films that, first and foremost, engage the audience. My personal and pragmatic interpretation of ‘engagement’ means simply to generate in the audience an ongoing desire to keep watching. I do not believe this will happen just because there is something intellectually interesting happening on the screen—rather it happens if the audience is emotionally engaged.

In my professional practice I came to understand that a first step towards achieving this was to emotionally engage the person who first saw the film—the editor. Others agree:

> We’re not trying to finish something in a technical sense. We’re actually trying to make somebody feel something, and initially the gateway to that is to make yourself feel something.
> —Ian John\(^72\)

Intuition is not a rational process, so its value is not easily spelled out. I believe it goes to the heart of how a movie makes an impression on the audience. As the editor watching the first assembly of a sequence, you are the first audience of the movie.

> —Mark Solomon\(^73\)

The documentary films that I was making were constructed of many visual and aural elements, each of which had its own distinct rhythm. For example, the subjects of our many filmed interviews each spoke with individual pacing and mannerisms. The real or illustrative footage had distinct rhythms in both the raw pictures and the accompanying wild sound. The expository presenter or narrator’s voice, if there was one, proceeded at a certain pace and emotional level. Various musical themes or sound effects might underpin sequences, and each had their distinct rhythm. Even the graphic elements such as titles, sub-titles, captions, credits and other text, all enter and exit their screen space at a certain time and pace. Every element has a rhythmic component, explicit or implicit, and sometimes the editor’s starting point is simply to find it:

> Sometimes I can spend a whole day without making a cut. I’m just watching it, looking at things and feeling the internal rhythm of a shot. Quite often I tell my students to go and feel the internal rhythm of a shot.
> —Mary Stephens\(^74\)

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\(^{71}\) Janata, Transitions, 202

\(^{72}\) Time Rhythm Magic, Davidson, 2013

\(^{73}\) Mark Solomon, Transitions: Voices on the Craft of Digital Editing (Birmingham, UK: Friends of ED, 2002), 85

\(^{74}\) Time Rhythm Magic, Davidson, 2013
So like the choreographer of a dance, the arranger for a band, the producer in the recording studio or the conductor of an orchestra, I came to realise that arranging the ‘performers’ of my documentaries—the selected clips with their diverse visual, aural and rhythmic properties—was much like arranging and rehearsing a complex musical score. When the composition was completed and the multiple rhythmic elements were working in a tight synergy, the effect, like music, could be visceral and intense.

It’s a feeling, you feel it, and it’s very musical, it’s not just magical, it’s very musical. I always suggest to editors two things they absolutely have to do. Go read poetry—and listen to music.

—Mary Stephens

My own increasing ability to feel the often complex rhythms of the sequences I was editing echoed my experience with musical arranging. I suspect the relationship between music and editing for me parallels the relationship between dance and editing that Karen Pearlman draws upon in her book Cutting Rhythms. Pearlman has a long experience as a professional dancer and choreographer, and brings her embodied wisdom in those disciplines to the practice of editing. She considers the rhythms of the dance, creating as they do physical, emotional and event energies, as key considerations for a film editor constructing an appropriately rhythmic edit:

The reason I think that editing is something that is strongly related to dance is that what the editor does is shape movement to create meaning. They shape the movement of the story, the movement of emotion and the movement of images and sound. And that is what a choreographer does… the choreographer is the person who makes a composition out of movement to make meaning, and that of course is what the editor is doing.

—Karen Pearlman

CUTTING BY HEART

For both dancer and editor then, movement is shaped by temporal parameters: duration, rhythm, placement, pace and timing. My editing methods became increasingly intuitive and responsive to both external and internal life rhythms in an iterative cycle of cognitive and organic reactions. It was indeed as Pearlman writes in Cutting Rhythms:

…an editor learns where and when to cut to make rhythm from two sources: one is from the rhythms of the world that are experienced by an editor, and the other is the rhythms of the body that experiences them.

75 Time Rhythm Magic, Davidson, 2013
76 Karen Pearlman, Cutting Rhythms: Shaping the Film Edit (Burlington MA, Focal Press, 2009)
77 Time Rhythm Magic, Davidson, 2013
78 Pearlman, Cutting Rhythms, 7
There are of course many such ‘rhythms of the body’, but the most fundamental and familiar is the beating of the heart. It was that primordial beat that led me to an interesting conclusion about the rhythm of the edit suite.

When labouring to make a cut work, going through the familiar iterative cycle of ‘cut—assess—adjust—cut again’, it was surprising how often the right place to cut would end up being exactly twenty frames—a little less than one second—from some other distinct event in the sequence, aural or visual.

For example, a cut might be made to a new scene in which a door opens and a character enters. The right time for that door to open was very often exactly twenty frames after the cut. A little earlier than that, and the transition was joltingly abrupt. A little later, the shift became hesitant and momentum was lost.

A related timing was also apparent in that basic element of documentary, the first-person on-camera interview, in which two things consistently occurred:

- the ‘right’ time to cut to a new scene after an interviewee had finished what they were saying was nearly always twenty frames after they had finished speaking;
- almost every interviewee blinked after they had said their final word—exactly twenty frames after they had said it.

There were exceptions to these conditions, usually when unspoken emotions were conveyed by expression or gesture. However, as I optimised many cuts in many films, this observation persisted, until eventually I realised why it was so fundamental. I was in fact, cutting by heart. The rhythm of the edit was matching, and resonating, with the beat of my heart—but how, and why?

As discussed earlier, standard film puts one still image (frame) on screen and then replaces it with another 24 times per second. Multiplying by the number of seconds in each minute, the standard film rate becomes 1,440 frames per minute.

Recalling my observation that the optimum editing rhythm was so often at 20 frame intervals, dividing the standard film rate of 1,440 frames per minute by 20, gives a result of 72. That number is the measure of a most fundamental human rhythm. It is the rate at which the human heart beats when we are at rest—72 beats per minute.

So by a little simple mathematics, I came to realise that my editor’s heart was beating once every twenty frames. It was no surprise that a twenty frame cutting rhythm was generating an organic feeling of ‘rightness’ in me. My heart was beating at the same rate.
As each edit is iteratively edged towards the optimum, I believe it is an interplay of many rhythms that resonates in the editor’s body, and becomes the principal determinant of their cutting decisions. Some of these rhythms are within the raw material—aural and visual rhythms, musical beat, voice patterns, graphics movement, emotional rhythms—and others exist within the editor. Finding the optimum cut thus becomes a process of seeking the point of maximum resonance, and the heart rhythm, beating once every twenty frames, is—both figuratively and literally—central to this process. The editor makes a cut, feels the rhythm, cognitively adjusts, cuts again, feels the rhythm and repeats that cycle over and over until the cut is right. Many logical cognitive adjustments will be made during the process, but no matter how prolonged and intensive their editing sessions might be, editors seem unanimous that it is always the organic response of their body, not their mind, that lets them know when they have got it right:

It’s *never* in the head that I know that it’s working, it’s always that I *feel* it’s working; and that is why it is extremely difficult, actually editing is something that is very difficult to teach.

—Mary Stephen 79

As an editor, your intuition is your best friend. There is simply no better guide to whether a scene is working than it ‘just feels right’. Intuition is a wonderful thing. You don’t have to explain it or justify it, but it does help to be able to articulate it. The most important thing however, is to listen to it.

—Mark Solomon80

I think everybody knows when they’ve got it right… you *know* that it is working. I don’t know how you know it, and the only way you know it is because it hits you emotionally, that you can *feel* it. You can feel a tingle, a chill down your spine, a prick in the eyes.

—Ian John81

All that I know is that when I’ve got it, I can feel the hairs start to stand up on my arms and up the back of my neck. It’s almost too much to keep sitting at the bench, I have to get up and walk.

—Annie Collins82

The world already exists in the footage, and the artist’s role is to bring into visibility that world… there’s always this energy going back and forth and circulating between the artist and the material. And when that happens the way it should, the way we would like it, then the result is a beautiful work of art.

—Vilsoni Hereniko83

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79 Time Rhythm Magic, Davidson, 2013
80 Solomon, Transitions, 2002, 85
81 Time Rhythm Magic, Davidson, 2013
82 Ibid.
83 Ibid.
I am confident all editors would agree that it is the interplay of the rhythms they feel round them, the rhythms within their material, and the rhythms within themselves that guide them to that result.

**A BLINKING NUISANCE**

Although my twenty frame heartbeat theory remains an excellent starting point for any cut, the other twenty frame event—the blink that almost every interviewee made at the end of their statement—creates a related problem. More often than not, the optimum cutting point, twenty frames after the interviewee’s last word, was also exactly the frame where their eyes were partly or fully closed in the course of a blink.

First impressions count, the saying goes, but experienced editors know that in screen media it is the last impression that counts. That is, the last frame we see before a cut to a totally new image, lingers disproportionately long in the viewer’s perception. This is especially true if you are cutting from a face, such as in the first person interview common in documentary.

So the editing dilemma is this: the optimum ‘out’ point, the last frame in the shot, is often at exactly the point where the subject’s eyes are part way through a blink. Making the cut at this optimum rhythmic point results in an unsatisfactory final frame, that then lingers as a poor ‘last impression’. Figure 22 illustrates this:

![Figure 22](image)

This common dilemma can be solved with a piece of invisible editing deception. At the point where the subject says their last word, their lips stop moving. Twenty frames later is the optimum cutting point, but at this point the subject is in the middle of a blink. To overcome this problem, as soon as the subject’s lips stop moving, the clip can be slowed down to 80 percent of normal speed, or a little less.

The visual effect of this time change is imperceptible, but now instead of the subject starting to blink twenty frames after their last word, the blink is delayed to twenty five frames later. Now the cut can be made at the optimal twenty frame point and the new clip starts before any blink has occurred. The sequence looks exactly the
same, the cutting rhythm is perfect, the last impression is favourable, and no one, except another editor, would ever know.

**Figure 23** Last Frame Blink avoided

The difference has to be seen to be believed, but it is only in the edit suite is the difference ever seen. To the audience, there is no indication that time has been so invisibly manipulated. The change is subtle, the illusion convincing and the effect often significant. Consider for example, which of the two persons below conveys the more credible, confident and honest personality?

**Figure 24** Last Impressions

Although a somewhat simplistic example, it also demonstrates the editorial power of the editor, who is capable of conveying a negative or positive impression of a subject, by this and other means, should that be the director’s or editor’s intent.

**SUMMARY**

In Chapter Five we have focussed on rhythm in editing, and examined the fourth proposition of the study which suggests that the choices an editor makes are determined by a complex combination of cognitive and organic factors. The multiple rhythms involved in the assembly of film sequences are discussed, and a quantitative connection made between the human heartbeat and optimum editing rhythms. Comments from a number of editors which support the proposition are included, a common theme being that their edits are judged by physiological and emotional impact rather than logical cognitive factors. Finally an example of a visual discrepancy arising from the twenty frame rhythmic pattern is described, together with a typical time manipulation which invisibly corrects it.
This research study is concerned with aspects of film editing, in particular documentary film editing. Film editing is the profession of a relatively small number of persons who work in a non-public situation, applying their art and craft in subjective, individual and creatively diverse methods. What every editor aims to achieve—a flow of sound and vision and sound that ‘feels right’—is an intuitive and organic phenomenon that each must experience uniquely, but must at least partly share with fellow practitioners. The final strand of my research thus set out to determine what degree of commonality might exist among editors, and to what extent discussion of their own experiences might resonate with my own. It was also possible that analysis and grouping of the responses might add some independent validation to the propositions of this study.

Cinema, in its many genres, is much concerned with illusions of reality, or the temporary suspension of reality, for the viewer. It is thus not surprising that the phenomenological issue of ‘being’ is readily adapted to cinematographical models and analogies in a great deal of research and literature. However it is more difficult to find studies directly relating phenomenology to the editing process. There may be phenomenological parallels in ‘being’ an editor, but questions of existence and reality, as addressed in philosophical phenomenology, seem less relevant to this study than the methods of psychological phenomenology research, which do seem especially helpful. In this respect the practice of film editing, and the editing experiences of individual practitioners, can be considered ‘shared phenomena’ and for this part of the study the systematic approach of Clark Moustakas was adopted. Clark Moustakas lists the basic steps of phenomenological research as:

1) Determine if the research concerns several individuals’ shared experiences of a phenomenon (in this case, the cognitive and organic experiences of film editing);

2) Determine if the research can be framed in terms of what it means to be a participant in these experiences;

3) Collect data, principally in the form of in-depth interview, recorded or otherwise;

4) Ask the participants common questions regarding their experience of the phenomenon;

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5) Analyse the responses for clusters of meaning with the intent of describing the essential invariant structure, or ‘essence’ of the phenomenon.

—Procedures for Conducting Phenomenological Research: Moustakas

I believe that Moustakas’ methodology provides an appropriate and reliable strategy for a study of the editing experience. Accordingly a set of questions was developed and a series of filmed interviews conducted with seven experienced editors from a variety of countries, cultures and film genre backgrounds. The participants have jointly edited many hundreds of films and documentaries, working with well-known directors including Ingmar Bergman, Eric Rohmer, Peter Jackson and Lee Tamahori, and between them have many Film Festival Awards, plus BAFTA nominations and an Academy Award for Editing. The editors who kindly participated in the filmed interviews were:

- Annie Collins  
  New Zealand
- Vilsoni Hereniko  
  Hawaii
- Mike Horton  
  New Zealand
- Sylvia Ingemarsdotter  
  Sweden
- Ian John  
  New Zealand
- Karen Pearlman  
  Australia
- Mary Stephen  
  France

Figure 25  Editors

A more detailed biography of each is given in Appendix I. Seven editors is clearly a tiny sample of the population, but I believe the diversity and depth of their joint experience is such that any conclusions reached have statistical validity and relevance for practitioners.

The resultant interview footage was sampled, assessed, grouped by commonality and assembled into a straightforward interview film. That film is titled Time Rhythm Magic: Conversations with Film Editors, and is the fourth and final studio work submitted as part of this study.

86 The questions put to each editor are listed in Appendix Three.
The film serves two purposes. Firstly, it is a concise audiovisual description and valid grouping of the participants’ editing experiences, and offers the viewer a composite description of the essential commonalities and structure of the editing phenomenon—in other words, its ‘essence’. On the basis of these interview responses I believe one may unambiguously conclude that the participants’ individual editing experiences are in most respects a shared and special phenomenon. The film is thus a satisfactory valid outcome of the phenomenological research, in that it makes it possible for the viewer to, as psychologist Donald Polkinghorne describes it, “come away with the feeling ‘I understand better what it is like for someone to experience that’.”

As a documentary filmmaker and editor, I also believe this short film effectively conveys to a general audience the ethos, methodology and passion for editing that unifies the participants. As such, the combined wisdom of this diverse group of experienced film editors makes an accessible and useful contribution to the body of editing knowledge.

**IT’S A KIND OF MAGIC**

When asked to describe the key defining moments in their experience of the edit suite, the interviewees consistently used one particular word—‘magic’. This was not entirely unexpected, but it posed two difficulties for this study. Firstly, although ‘time’ and ‘rhythm’ can be discussed in quantitative terms and with appropriate academic rigour, this is more problematic with respect to ‘magic’. As an academic researcher, I can understand that. But as an editor, I suggest it is not possible to exclude the word ‘magic’ from a credible study of the film editing experience.

Consider the various definitions of the word:

**magic: noun.** (1) A power that allows people to do impossible things by saying special words or performing special actions

(2) tricks that seem to be impossible and are done by a performer to entertain people

—Merriam-Webster Dictionary

**magic: adjective.** A quality of being beautiful and delightful in a way that seems remote from daily life

—Oxford Dictionary

It is illuminating to imagine how applicable these definitions might be if the word ‘magic’ was replaced with ‘editing’. In my view the words then become equally descriptive of the “power” editors have at their fingertips, the “tricks” they perform to

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entertain, and the “beauty and delight” they bring to their audiences. I am sure Dr Karen Pearlman agrees when she says:

Editing is a magic trick in a certain way, in that it activates the viewer’s mind without necessarily alerting them to the fact that it is activating their thinking processes. Any action which gets the spectator to use their own powers of observation and cognition to make meaning - that’s got to be a magic trick!  

I believe from the evidence presented in *Time Rhythm Magic*, that the word ‘magic’ is an appropriate, and perhaps the only adequate, way to describe the combination of psychological, emotional and physiological responses experienced by editors in their shared ‘phenomenology of the edit suite’. They seem to agree:

Oh absolutely, of course magic happens. I mean it’s why we do the job, it’s why we slave for hours on end to get something absolutely right. We’re not trying to finish something in a technical sense. We’re actually trying to make somebody feel something.

—Ian John

Magic doesn’t come from (the head), magic comes I think more from what Hawaiians call *uhane* which is more like your gut, three inches above your belly button. That’s where the seat of truth resides for Maori and Hawaiian people… But I think for not just Hawaiians but for Polynesian cultures maybe, it’s from the gut that you know you’ve got it right. And that’s when the magic happens.

—Vilsoni Hereniko

Out of that fusion of picture and sound, you get this third element that comes up out of the middle of it, and that’s when the magic happens. And that is pure magic. I don’t know when it’s coming. I’ve got a fair idea that if I put this sort of element with this sort of element with this one, or this piece of concept with this piece of concept, that some sort of collision is going to happen. But I don’t know, until it’s on the bench and I try it, whether the magic will come, whether that thing will rise up out of it.

—Annie Collins

The flint strikes, a spark of life is born. I’ve long been obsessed by that wondrous moment when blurs of movement and snippets of sound fuse into something living, something rich with emotion—an honest riveting experience for the audience. The transformation is mystical and exhilarating in any editing room.

—Lee Unkrich

That was magic for me, and it’s a huge kind of gift from the ancestors if you like… But that meant living and breathing the material, and you are so enclosed by this thing that comes

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88 *Time Rhythm Magic*, Davidson, 2013
89 Ibid.
90 *Time Rhythm Magic*, Davidson, 2013
91 Ibid.
in and out of you and your brain and your thoughts. And unless the artist, whether it’s the editor or the director, is in that kind of milieu, or sacred space, you won’t get magic.

—Vilsoni Hereniko

Where do I get that biggest tingle, that biggest buzz, where is the moment that I can actually grasp that and say “this is working”? And when that happens and the magic is there, don’t lose it, don’t throw it away. Keep it, distil it—and put it in the final picture!

—Ian John

I submit therefore that the responses of these seven experienced editors, as referenced in this exegesis and presented in the film *Time Rhythm Magic: Conversations with Film Editors*, provide valid conclusions from correctly conducted phenomenological research, research which confirms that the editing experience is a ‘shared phenomenon’. The film also provides credible independent support for the third and fourth propositions of this study, namely, that tiny but vital manipulations of timing and rhythm are crucial techniques used by film editors; that their editing decisions are optimised by responses to emotional and organic resonances; and that the term ‘magic’ is an appropriate qualitative descriptor for the process.

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93 *Time Rhythm Magic*, Davidson, 2013

94 Ibid.
Chapter Seven

The Documentary Studio Works

The best compliment one can pay an editor is to tell them that their work is invisible.

—Ephraim Katz

When designing original studio practice which would unambiguously address and support the research, a number of new documentary possibilities with particular relevance arose. From these three projects were chosen as practical implementation of the principal concepts addressed in this study: sampling, time shifting and rhythmic assembly.

The three works each fall into the category of historical documentary, and each story, being founded in known events and real people, is clearly non-fiction. However a distinctly different creative approach was taken for the three works, giving each finished film a unique narrative topography and aesthetic content. The type and amount of sampling varied, the filmic time manipulations were different, and the internal and external rhythms were quite distinctive for each film. Broadly categorised, the three works can be considered examples of the expository, the reflective and the poetical mode of documentary respectively, and all are, as Bernard defined earlier, ‘creative non-fiction on screen’—a documentary film.95

Theories for the practice of editing continually evolve, as cinema and screen media themselves evolve. As fascinating as the debate may be, as a working editor I find myself constantly returning to the fundamental point of all editing endeavour—to make a film and engage an audience. I could not agree more with editor Tuula Mehtonen when she advises fellow practitioners:

It is important to consider the experience of real viewers. Through our own reactions and through a test audience we get valuable information we need in editing. But we have to learn to formulate our own questions, because empiric reception research very often expresses what we as film makers already know. (added emphasis) Editors have a lot of silent knowledge on how emotions occur… being able to analyse theoretically the stimuli of emotion is important. However we must remember that as artists we should not feel any academic pressure—only the right to get inspired! Clear thinking and brilliant theories are a means to an end for a working editor—the end being brilliant practice.96

The author’s professional practice is embodied in the studio works submitted herewith. The works are both a source of empirical data for this study, and a visible manifestation of the principles and propositions herein.

96 Tuula Mehtonen, “Theory for Practice”, Maximising the Moment - Theories for the Practice of Editing (Helsinki, FI: University of Art and Design, 2005), 16
PAST FORWARD: Bringing an Old Building to Life

The inspiration for this film came when I attended a presentation for the Brisbane Historical Group by research methodologist and historian Dr Bill Metcalf. The creative possibilities for the content as a screen story, and the availability of a personable on-screen expert presenter, led me to develop a screenplay in traditional expository style. The frequency and width of sampling over a one hundred and thirty year time span yields a volume of data that can only realistically be communicated this way, with much of the information presented verbally, either as narration or by on-screen presentation. Recognising that the basic history was inherently somewhat dry and of little interest to a general audience, many creative devices were employed to present, or illustrate, historical facts in a manner that would both engage and inform. In particular much use was made of the leaps in filmic time and place that the cinematic structure, via creative editing, permits.

ANNOTATED EDITING STORYBOARD: Past Forward

Much of the extensive macro- and micro-sampling involved in the production of Past Forward was discussed in Chapter Four. Further creative considerations and temporal manipulations in the editing of the film are outlined in the annotated storyboard which follows. The viewer may note that Past Forward is an especially busy film, which may well reward subsequent viewings.

[1] The film commences with an intensively edited sequence creating an abstract layered montage of antique film technology and associated textural layers. These resolve into the building which is the subject of the film, overlaid with title graphics. Underpinning it all is a contemporary and oddly syncopated musical theme mixed with a soundscape of classic film audio.

[2] The expository style is quickly established as the expert presenter is introduced and invites us to join him.

[3] A little ‘green-screen’ editing then opens the door to another time and place—nineteenth century Brisbane—where archival photographs illustrate the early history. Subtle animations add a degree of depth and some visual exclamation marks to otherwise static old photographs.

[4] Further history follows. The 1902 building extension is illustrated with beautiful architectural drawings of the time, and we chronologically link past and present via four generations of the family architectural firm responsible for various reincarnations of the building.

Figure 26  Annotated Storyboard
[5] There is then another temporal leap as two dancers unexpectedly step from a 1920s ball crowd and waltz into the present day. A significant amount of precision editing was required to locate them in both places, including shifting the visual rhythm of their dance to synchronise with the quirky waltz-time audio track.

[6] The dance involves more ‘green-screen’ illusion, but now the magician reveals the trick, simultaneously returning us to the present time and place.

[7] The power of editing also puts the presenter in different times and places, as he is transported from artist Richard Randall’s studio in the Botanic Gardens to the 1914 gallery showing his works. The decades are again spanned as we interview the artist’s great niece.

[9] The story moves on to the Second World War, during which the building was commandeered by US Pacific Forces. Photographs of the adjoining dry dock submarine base, military HQ and US personnel capture the atmosphere of wartime South Brisbane.

[10] The post-war period sees the building flourish as a major city library. Visual records of this important period are few, but samples from the childhood memories of the caretaker’s daughter, who lived in the building for many years, add depth and warmth to the story.

[11] The port and railway close down, the area declines, and an era of decay begins when the dry dock closes in 1972, to a poignant farewell from our presenter. Two decades later a major revitalisation of the area begins, and in 2006 the building reopens as Griffith Film School.

[12] The film ends with a scene of students enjoying their brand new cinema inside the building, but in a nod to its rich history the credits roll in the manner of an old-time movie, in an appropriate final editing illusion.

*Past Forward* premiered in Brisbane on 13 March 2012. Several hundred DVD copies have been sold and the film is lodged with the Queensland State Archive and other libraries throughout the State. I later edited two further versions, including one with Mandarin subtitles intended for the Beijing Film Institute, China.

The communication objectives of *Past Forward* were to engage, entertain and inform a general audience. By judicious sampling of the data, creative leaps in time and space and the synergy of multiple rhythmic elements, I believe those objectives have been met in a successful documentary work.
The expository and deliberately quirky style of *Past Forward* could hardly have been more different from the approach taken for *Ragged Bloody Heroes*. Once again, it is a real story being recounted, or more precisely, remembered. Factual footage of the past was available, the key annual event could be re-enacted, and participants in the history being remembered could give reflective testimony if required. Therein lay the elements of a standard reflective documentary, but this film is not of that genre.

In *Ragged Bloody Heroes* the story is not told in scripted narration or interview clips, but in the words of a song. The singer is the narrator, and explicit rhetoric gives way to abstract associations of mood, imagery and texture, bound together by a strong 4:4 musical rhythm. As a documentary the work thus falls into the ‘poetic mode’, an abstract and artistic expression of the real rather than the real per se. In this less common documentary genre, as Spence and Navarro describe it, “poetic constructions prevail over the prosaic quality of storytelling.” They continue:

> These documentaries manage to skirt both narrative and rhetorical conventions by organising their material around freer associations, sometimes arranging the material in formal patterns, often incorporating aesthetic experimentation and the filmmaker’s personal perceptions.  

Exploration of the poetic form appeared especially relevant for this study because the literature suggests it depends more than most forms on post-production, with ‘rhythmic editing’ and a ‘mesmeric montage style’ constructing a ‘poetic, contemplative framework’ for images and stories of the world.  

Well known examples of this often powerful and hypnotic poetic genre include films like the very early *Berlin: Symphony of a Great City* (1927) and the well-known *Koyaanisqatsi* (1983) which explores the cities and landscapes of the United States to the music of Philip Glass.

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99 *Berlin: Symphony of a Great City*, directed by Walter Ruttmann. Film, 79 minutes (Fox Europa, 1927)

100 *Koyaanisqatsi*, directed by Godfrey Reggio. Film, 85 minutes (Institute for Regional Education, 1982)
I am grateful for the serendipity that brought me an opportunity to explore the special aesthetics, rhythms and emotions of this documentary form in a special tale of real people and real events—*Ragged Bloody Heroes*.

**BACKGROUND**

In May 2009 I travelled to the annual Urban Music Festival at Caboolture, 50km north of Brisbane. Among the performers there was a singer from Sydney named Luke O’Shea,¹⁰¹ who performed a simple acoustic version of his song *Ragged Bloody Heroes*, a tribute to the soldiers of Australia and New Zealand—the ‘Anzacs’.

The message and the music of the song resonated strongly with me, and after the show I sought out Luke to tell him that if possible, I would like to make a New Zealand themed video to complement his song. We exchanged emails and went our ways.

After some more planning back in New Zealand, I engaged a Wellington based researcher to search out military records, archive footage and potential locations. We then put the idea to the national headquarters of the New Zealand RSA (Returned and Services Association). They were enthusiastically supportive and came up with a little funding. More importantly, they were able to arrange supplies of flags, uniforms and other props, access to special locations and contact with genuine war veterans prepared to play a part.

**SCREENPLAY**

Luke’s song told the Anzac story in a generalised way, as songs do. The planned imagery to accompany it aimed to complement the words in a somewhat loose ‘poetic’ manner, but two new storylines would also be woven into the screenplay. These would be told in visuals only and be independent of the lyrics. In the first scenario, a group of old war comrades visit their local RSA clubrooms and watch newsreel footage of soldiers in action, contemplating their experiences and loss. The second parallel story tells of a young family preparing for the Anzac dawn parade, where they join the veterans, lay a wreath and contemplate the names on their community memorial. The song and parallel stories then merge and resolve in the final chorus, where each veteran recites a line of Binyon’s famous ode from *To the Fallen*.¹⁰² The song ends in a layered montage of past and present, an aggressive guitar outro and the echoes of a Maori warriors’ *haka* (war dance).

As white men are the usual protagonists in traditional war films, a specific communication objective for the clip was to reiterate the Anzac message in a manner

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¹⁰¹ Luke O’Shea is a multiple winner of Artist and Song of the Year at the CMMA (Country Music Association of Australia) annual awards. Full details at www.lukeoshea.com

¹⁰² Laurence Binyon, *To the Fallen*, poem (London UK: The Times, September 1914)
that would engage others, especially women and young people. Many aspects of the visual screenplay were influenced by this consideration, with some care taken to avoid gratuitous political correctness. In the film a young girl prepares for the dawn ceremony, her ‘tween’ flashing shoes marking her as a contemporary young woman. Both men and women military personnel feature in the newsreel footage, and among the honour guard at the memorial. Families, veterans and service personnel gather at the memorial; a young boy staunchly holds the flag in the Wellington wind; soldiers of the 8th Maori Battalion are seen in archive footage; and the music is underpinned with a Maori karanga (welcoming call) and warriors’ haka, an unequivocal placement of the action on the New Zealand side of the Tasman.

The production phase was short but intense, filming being completed over three days in February 2010. Location shoots always involve the unexpected, including in this case a dawn weather cancellation, but the necessary scenes were completed and editing began.

**POST-PRODUCTION**

Post-production of the clip followed, together with an associated ‘making of’ documentary. The editing process was a combination of straightforward sequential sequences interspersed with more visually complicated layered sequences. Surprisingly, the singer only appears on screen for twenty-six seconds of the total four minutes and ten seconds song. However, the strength of his performance is such that the viewer quickly relates to his personality, passion and direct delivery of his message—“I shall not forget.”

With a strong music bed driving the clip, it would be easy to assume cutting was dictated by the musical beat. On the contrary, a great deal of micro-sampling at the one-frame level was necessary so that the aural rhythms, cutting rhythms and internal shot rhythms worked in contrapuntal sympathy. The layered sequences in particular demanded much iterative adjustment of entry point, clip speed and dissolve rate to achieve the desired visual dynamic and emotional rhythm. Further reference is made to some of the key edited sequences in the annotated storyboard following. The overall editing strategy was to maintain the emotional power of the words and music whilst layering a horizontal montage of separate but complementary visual narratives, together with increasingly complex layers of vertical montage. The process was intensive and challenging, but even after many viewings over several years, in my view the clip is edit-perfect—there is not a frame I would change.

An annotated storyboard is provided to reference key edit decisions and timings in the editing of *Ragged Bloody Heroes*. 
[1] The early scenes are straight-forward cuts, as the young girl puts on her shoes in the early morning, and others get ready for the dawn parade. In a parallel storyline four old soldiers arrive at their RSA club and sit to watch war footage on newsreels of the past.

[2] Here is the first subtle special effect, where the footage the men were watching as they were filmed, is replaced by archival wartime footage. The unstated implication is that they are watching film of themselves.

[3] As the full band kicks in on the first chorus, the singer and band emerge from the flash of an explosion. This scene is a key rhythmic moment with many crucial timings despite lasting just twenty frames. This is the only time we see the band, but their presence remains strong throughout.

[4] As the chorus ends, a long dissolve takes us from the singer back to the dawn crowd arriving at the memorial. The flashing shoe reconnects us to the young girl, even though we haven’t seen her face yet. A haunting karanga calls the visitors onward.

[5] Subtle timing nuances permeate the second verse. We cut between the screen action and the faces of the vets, timing a blink or the touch of an eye to maintain the emotional rhythm. A cut to the first close-up of the singer puts particular emphasis on the key words “Anzacs, from the southern lands, New Zealand and Australians.”

[6] The second chorus follows the visual rhythms of the first. As the chorus starts, the singer briefly appears on the vets’ screen, in a subtle editing link between past events and the present action of the song performance.

[7] The editing becomes increasingly layered, as we connect marching soldiers of the past to the young honour guard at the monument and the dawn crowd preparing. Flags flutter in the Wellington wind and a morning sun rises to dramatically back-light the scene.

[8] A key moment as the music pauses; we see the faces of the crowd for the first time—schoolchildren, veterans, civilians and serving personnel in quiet reflection as our young protagonist lays her wreath. A fade to black complements the musical pause before the final chorus, and gives a parallel moment of reflection for the viewer.
[9] The final chorus transposes up a key, cleverly lifting the emotional intensity. The musical rhythm does not change, but the visual rhythm accelerates as three layers in constant motion mix images of historic action with images of the dawn service activities. Micro-adjustment of many timings determine the flow of this complex montage sequence.

[10] Four veterans each recite one line of the Ode in a clearly heart-felt and intense experience for each of them. Between each line the singer reiterates his key promise—“I shall not forget.”


[12] The musical, visual and emotional rhythms reach a crescendo and a simple but visually stunning resolution, as the final sustained guitar note fades to the last sounds of the haka. A visceral and welcome release of tension to end this unique performance and powerfully poetic celebration of the legendary Anzac story.

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**Ragged Bloody Heroes** premiered at the National War Memorial Museum in Wellington on 8 April 2010 and was released two weeks later for Anzac Day. The project generated significant media interest, was well received by schools, and the national RSA despatched copies of the DVD to all 180 clubs throughout New Zealand.

The film and associated ‘making of’ documentary screened on Stratos TV on Anzac Day 2010, and **Ragged Bloody Heroes** continues to be screened each Anzac Day on TVNZ, CTV, and Maori TV.

Two news clips from New Zealand television regarding the premiere are included as a prologue on the **Ragged Bloody Heroes** DVD submitted herewith.
ONCE WERE WHALERS: Community, conservation and change

BACKGROUND

For a hundred and fifty years the Guard, Heberley, Norton and Perano families hunted humpback whales in Cook Strait, the narrow passage between the two main islands of New Zealand. For them and their community, nothing was more exciting or heroic than to be a gunner on a whaleboat. The Perano brothers whaling station in remote Tory Channel, just off the strait, was the most long established and successful whaling operation in New Zealand—until it all abruptly ended in December 1964.

Fifty years later, the last of those whaling men have come back to Tory Channel and again scan the waves of Cook Strait looking for humpbacks. When they find them, the boats again race out in hot pursuit—but this time, not to kill. Nowadays, the old whalers and young conservationists team up to find, identify and tag the whales, so that their great Pacific journeys are better understood and their survival assured.

In a world of new understanding and conservation, have the old whaling heroes become latter-day villains? How does their community now view them, and how do they themselves feel about what they once did?

An opportunity came to explore these questions when I was invited to film the New Zealand Department of Conservation’s annual whale survey. The survey station is situated in Tory Channel, overlooking Cook Strait, where the whales were once hunted, and is accessible only by sea. My regular self-funded trips to the station enabled me to spend time filming the survey and its participants in an observational but interactive manner, without any clear notion of what was happening, or what might happen.

However as filming proceeded and I got to know the old whalers, it became clear that there was a good story to be told. It was also clear that the best way to tell it was in first-person reflective testimony from the persons most intimately involved—the whale men themselves.

This third documentary, Once Were Whalers, is thus quite different from Past Forward and Ragged Bloody Heroes, in that the story was found and extracted from observational film footage. No prior script development or detailed production planning was possible; in fact production planning at this remote location involved nothing much more than just waiting, and being ready to shoot whatever might happen. The real work started back in the edit suite, and the whole project was a good example of the observational ‘found’ story that editor Julie Janata is referencing when she writes:

On the other hand documentaries, especially those without a narrator or script, are wholly created in editing. No matter how well planned, it’s impossible to know what will happen

TRM Page 76
during shooting, so, as the editor, you literally find the story in the footage you get and build the structure from that. With documentary you are effectively the writer as well as the editor.\textsuperscript{103}

**EXTRACTING THE STORY**

What Janata describes is essentially what happened with *Once Were Whalers*. No screenplay, script, narrative arc or communication objective had been established before filming. Some events unfolded during filming which clearly had potential as interesting sequences, but the building of a screen story did not really start until many hours of footage had been logged and reviewed.

As with *Past Forward*, macro-sampling was crucial to the process. From the observational footage it was possible to extract content with visual and emotional impact, which might provide the hooks on which an engaging story could be hung. A tension of uncertain expectancy existed in the long periods the old whalers spent searching for the tell-tale spout of a humpback, followed by much excitement when one was spotted. The drama then intensified as the young conservationists set off on the chase. Would they be able to find the whale, could they get their boat alongside it, would their dart gunner get a successful shot? Here were the makings of a compelling narrative structure.

Complementing the action were more subtle human relationships, revealed in both the observational footage and the location interviews with various participants. A cautious uncertainty was evident as the old whale hunters worked alongside young marine biologists and the female project leader. The men now reflect on their bloody and dangerous past careers with nostalgic affection, but do they feel any guilt, far from the ethos and values of the society of their youth? Or should they?

My research also uncovered some unique colour footage of 1950s whaling by a local amateur filmmaker. His grandson was traced to Austin, Texas, and the rights to use this previously unseen footage were duly granted. Much of the footage is graphic and initially shocking to a present day audience, but it is an illuminating insight into the remarkable seafaring skills of the men, and the ever-present dangers they casually faced in their day-to-day job.

These men also spoke warmly and frankly in a series of interactive interviews filmed as they worked at their whale-spotting. Condensed and re-timed, these interviews have become the first-person narration for the film. This technique demands much careful micro-sampling and compression of content to deliver a concise and cohesive narrative. It is also a documentary method that demands more of the editor, and the audience, than a traditional scripted narration. In my view this disadvantage is greatly outweighed by the absence of editorial bias, the greater ‘truth’, and the

\textsuperscript{103} Julie Janata, *Transitions: Voices on the Craft of Digital Editing* (Birmingham, UK: Friends of ED, 2002), 211
intimate insights into emotion and character provided by letting the participants tell their own story.

In summary, I believe *Once Were Whalers* successfully melds personal stories, remarkable archival film, and the excitement of the chase, into a thoughtful documentary exploring the changed status of whaling, the community that once depended on it, and the transition from hunter to protector of the men who once lived it.

Outwardly appearing a more straight-forward edit than *Past Forward* or *Ragged Bloody Heroes*, *Once Were Whalers* was equally demanding for other reasons. The most significant of these was the need to create the entire story by macro-sampling a mass of unscripted raw footage. As Julie Janata puts it above—the editor also had to be the writer.

A further annotated storyboard is provided to reference key edit decisions and timings in the editing of *Once Were Whalers*.

**ANNOTATED EDITING STORYBOARD: Once Were Whalers**

[1] *Once Were Whalers* is of the interactive observational genre of documentary, and a key narrative component is the spoken testimony of the whalers and other survey participants. However, the time and place is set early with gentle visuals and a text roll as the film commences.

[2] The first of many temporal shifts dissolves to the same place fifty years earlier. The quiet spotting of the present is replaced by the dramatic reality of a whale chase in the rough seas of Cook Strait. No narration is necessary, the action is graphically self-evident. The visuals are underpinned by an initially subtle theme track, which rises to match the intensity of the action before reaching a crescendo as the title image and graphic appear. [3]

[4] From the past to the present and back again, as traditional spotting activities are mirrored in the work of the current team. The renewed camaraderie of the old whalers and their enthusiasm for the work, both then and now, becomes apparent. In parallel the young team of conservation scientists set up their equipment and go about their measurements.

[5] Editing compresses the real-time action and extracts key interchanges in the crowded tent, as all the while the tension, and the hope for a whale sighting, grows.
[6] A whale is spotted! The boat team swings into action and the chase is on. All the elements of the classic cinematic chase are here—excitation, potential conflict, disappearance and reappearance, much shouting, near misses, intensification, culminating in climax as the whale surfaces and is tagged.

[7] However, unlike a scripted chase, there is little need (and in fact no alternative angles available) to intensify the visible and audible action with explicit cutting rhythms or underlying theme music. The sea-borne handheld camera, the unfolding reality, and the uncertainty of outcome give the sequence the feel of ‘direct cinema’ or newsreel, in which the film spectator shares the emotion of the chase and the exhilaration of the participants. [8]

[9] The tensions of the present-day chase provide a useful emotional reference for the real hunting of the past, as the former gunners, spotters and boat crew give reflective testimony of their experiences and memories. A series of conversational interviews here in the men’s working environment has yielded much good footage of personal insight into their former whaling days. [10] However, a considerable amount of micro-sampling, condensing and editing was necessary for assembly into concise and coherent first-person descriptive narration.

[11] The availability of good quality, relevant illustrative footage to cover multiple voice edits, helped create cohesive stories from each of the participants. The interview clips also reveal some of their personal character, their nostalgia for the past and their mutual respect for each other as good men of an era now gone.

[12] The film comes full circle with some final reflections from the men. The editor then literally mirrors whaling past and present in a reprise of the opening soundtrack and a final graphic, credit sequence and surprise after-thought. The story is told.

Once Were Whalers premiered at a special function at the Edwin Fox Maritime Heritage Centre, Picton NZ, on 20 December 2014. This event marked fifty years to the day since the last whale was killed in New Zealand waters. Prior to that I shot the footage for a TVNZ news story which aired on the evening of the event. That news story is included as a prologue to the story on the Once Were Whalers DVD submitted herewith.
Chapter Eight

SUMMARY and CONCLUSIONS

Editors have always been, and always will be, the keepers of the magic—the alchemists of cinema.
Lee Unkrich

The analyses and analogies discussed in this work have emerged, firstly, from a cumulative reflective analysis of a body of documentary editing work spanning thirty-five years, and secondly, from practice-based research embodied in the four documentary films produced as the substantive component of this study.

The first proposition of the study is that the process of constructing certain forms of documentary film involves the selection of small segments, or samples, taken from a large whole and re-assembled into sequential sub-sets to create a reductive representation of that whole. After a more general discussion of time in cinema and the temporal mechanisms involved in the cinematographical illusion (Chapter Two) the first proposition is specifically argued in Chapter Three, with a particular focus on the editing of historical documentary. The concept of macro-sampling from an extensive whole of base material is explained, then micro-sampling is illustrated with a case study from the studio work. The invisibility of this sampling is demonstrated and the illusory nature of perceived reality in documentary discussed. Overall it is argued that the process of sampling from a whole and re-assembly as a documentary film sequence is proven as a valid representation of the documentary editing process.

The second proposition is that useful analogies exist between this sampling and re-assembly process in documentary film editing and the process of sampling, encoding and re-construction inherent in digital telecommunication systems. Chapter Four commences with a discussion of the sampling process in telecommunications and an illustration of how time might be divided and shared in such systems. The sampling, encoding and re-assembly process in Pulse Code Modulation is explained so that the analogies with the documentary editing process might be established. The qualitative parameters used to measure the performance of communications systems are listed, and methods to use such parameters as a disciplined subjective assessment of documentary quality are suggested. Useful application of the sampling analogy as a practical editing methodology is illustrated with another example from the submitted studio work. It is thus submitted that the interdisciplinary analogies of the proposition are both valid and useful as an approach to documentary editing, and that this argument is well validated in Chapter Four.

The third proposition of the study argues that the sampling and other temporal manipulations of the documentary editor are essentially invisible to the audience, which remains unaware of the mechanisms even when fully engaged with the outcome. By this means, a documentary film editor creates convincing but illusory
representations of reality, illusions which can be described as a form of ‘magic’. This is discussed and illustrated with examples in Chapter Five. Much empirical support for this proposition is given in responses from other editors, either taken from relevant literature or extracted from the seven original interviews conducted for the study.

The fourth and final proposition overlaps the others, and suggests that film editing in general is a highly iterative process involving a complex combination of cognitive, emotional and organic resonances within the editor. This combination of resonances is an experience shared by many editors, and may be characterised as a unique ‘phenomenology of the edit suite’. This proposition is examined in Chapters Five and Six where the interaction of various rhythms in both the material and the editor are discussed and demonstrated, rhythms at the heart of the editing process.

Overall, I am confident that the outcomes of this reflective analytical research, together with the practice-based research embodied in the four film studio works, provide sufficient qualitative evidence to validate all four propositions. I also believe a subjective sample-based approach to documentary film editing, drawing from the temporal aspects of communications systems discussed in this study, provides a useful adjunct to traditional practice for such editing endeavour.

I also submit that the results of this empirical research study support the proposition that film editors use multiple temporal manipulations, invisible in the outcome, to create the convincing illusions of the cinema and screen media.

As we have heard, ‘magic’ is a word used by all the editors who were interviewed for this study. However, in the documentary genre, where my own experience sits, I suggest an even better term is ‘alchemy’. As Lee Unkrich puts it:

> The medieval alchemists were obsessed with the notion that they could take something plain, something simple, something worthless, and through the diligent application of chemical and magical processes, somehow transform it into a thing of beauty, value and significance. Kind of what like an editor does.104

Indeed, the documentary editor takes a base material of raw footage, sometimes very ordinary indeed in cinematographic terms, and strives to turn it into something of great value—a finished film. This study suggests that the editor’s power to invisibly manipulate time, duration and rhythm to alter filmic time and space, provides the craft and the catalyst for cinematographic alchemy.

For this documentary film maker, that alchemy has made it possible to put ‘creative non-fiction on screen’, and in so doing tell stories of ordinary people, doing extra-ordinary things, with concision, integrity and truth. It has been a privilege.

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APPENDIX I: The Studio Works – On-line Access

Four completed documentary films are submitted as the studio works associated with this doctorate study. The films are discussed in the body of the text and submitted in DVD format together with the hard copy of this exegesis.

For readers of the text in digital format, the four films are also available on-line at the following links:

- *Past Forward*: https://vimeo.com/190299939
- *Once Were Whalers*: https://vimeo.com/190468146
APPENDIX II: Selected Filmography–Paul Davidson

All films written, directed and edited by Paul Davidson unless otherwise stated

**A Short History of Griffith Film School.** Griffith Film School: DVD / USB, 13 minutes, 2013.

**A Test of Faith.** St Mary of the Angels, Wellington: DVD / Online, 16 minutes, 2015.

**Answer It Anywhere.** Telecom New Zealand: VHS, 16 minutes, 1986.

**Being More Specific.** Otago University School of Medicine: VHS, 18 minutes, 1982.

**Carbon Zero.** Grove Mill Wine Company: DVD, 12 minutes, 2006.

**Chlamydia is Not a Flower.** Abbott Laboratories: VHS, 14 minutes, 1984.

**Danger Down Under.** Telecom New Zealand: VHS, 14 minutes, 1984.

**Doing It Digital.** Telecom New Zealand: VHS, 16 minutes, 1986.

**Driven to Discover.** Marlborough Wine Research Centre: DVD / Online, 13 minutes, 2009.

**Early Paths.** McKenzie Early Intervention Centre: VHS, 14 minutes, 2002.

**Early Paths.** Roy McKenzie Foundation: VHS, 16 minutes, 1999.

**Getting In Touch.** Otago University School of Medicine: VHS, 14 minutes, 1981.

**Giving It All Away.** Roy W Dean Foundation: VHS / DVD / TV, 75 minutes, 2005.

**Helen’s Story.** Hospice New Zealand: DVD / Online, 72 minutes, 2015

**Home is Where I Choose to Be.** J R McKenzie Trust: VHS, 22 minutes, 1993.

**Hope House.** Bread of Life Trust: DVD / Online, 12 minutes, 2012.

**Hospice Story.** Marlborough Community Hospice Trust: DVD, 14 minutes, 2008.


**Living Till You Die.** Mary Potter Hospice Foundation: VHS, 48 minutes, 1984.

**Lochmara Lodge.** Lochmara Lodge Wildlife Recovery Centre: DVD, 12 minutes, 2008.

**Love Marlborough.** Destination Marlborough Trust: DVD, 9 minutes, 2006.

**Mining Women.** Griffith Department of Employment Relations: DVD / Online, 14 minutes, 2007.

**Ngati Apa Were Here.** Ngati Apa Ki Te Ra To Trust: DVD, 3 x 10 minute series, 2002.

**Not In Our Street.** Richmond Schizophrenia Fellowship: VHS, 18 minutes, 1992.

**O is for Ostomy.** Federation of New Zealand Ostomy Societies: VHS, 14 minutes, 1991.

**Once Were Whalers.** New Zealand Department of Conservation: DVD, 34 minutes, 2014.

**Packet Switching.** Telecom New Zealand: VHS, 12 minutes, 1985.

**Past Forward.** Griffith Film School: DVD, 25 minutes, 2012.

**Perano Whale Station Restoration.** New Zealand Department of Conservation: DVD, 22 minutes, 2011.

**Pressures with Precision.** Otago University School of Medicine: VHS, 10 minutes, 1982

**Ragged Bloody Heroes.** New Zealand Returned and Services Association: DVD / TV, 4 minutes, 2010.

**Rainha Vermelha (Red Queen).** Mike Douglas Music Brazil: DVD, 4 minutes, 2007.

**Remembering David.** Auntsfield Estate: DVD, 22 minutes, 2010.

**Shaping Futures: 40 years at Mt Gravatt.** Griffith Faculty of Education: DVD, 23 minutes, 2009.

**Sharpen Up.** New Zealand Wine Growers: DVD, 10 x 10 minute series, 2011.


**Stretching the String.** Telecom New Zealand: VHS, 14 minutes, 1987.

**The Biggest Love.** New Zealand Ministry of Health: VHS / TV, 22 minutes, 1989.


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**The Kaikoura UFOs.** Bytesize Productions: DVD, 30 minutes, 2008.


**The Standard Bearers.** Standards Association of New Zealand: VHS, 16 minutes, 1986.

**Time Rhythm Magic: Conversations with Film Editors.** Bytesize Productions: DVD, 22 minutes, 2013.

**Vintage Marlborough: 30 Years of Festival.** Marlborough Heritage Trust: DVD, 45 minutes, 2015.

**Working for Justice.** New Zealand Department of Justice: VHS, 48 minutes, 1989.
APPENDIX III: Editor Biographies

Annie Collins  New Zealand

Annie Collins is based in Wellington, New Zealand and is best known for her editing work on Peter Jackson's Lord of the Rings trilogy. She was film conformer on The Fellowship of the Ring (2001), moved up to assistant editor on The Two Towers (2002) and as additional editor with Jamie Selkirk won an Oscar for Best Editing for The Return of the King (2003). Other significant films Annie has edited include Scarfies (1999), Out of the Blue (2006) and the documentaries Patu (1983) and The Neglected Miracle (1985).

Michael Horton  New Zealand

Michael Horton is based in Wellington, New Zealand and since 1970 has edited many television programmes, hundreds of commercials and over 25 feature films. These include the iconic New Zealand movies Goodbye Pork Pie (1980), Utu (1983) and Once Were Warriors (1994). After completing Sam Neal's documentary Cinema of Unease (1995) Mike edited the mockumentary Forgotten Silver (1995) for director Peter Jackson and continued on to edit The Two Towers (2002) from the Lord of the Rings trilogy, for which he was nominated for both a BAFTA and an Academy Award for editing.

Vilsoni Hereniko  Hawaii

Playwright, screenwriter, director and editor based in Hawaii, Vilsoni has produced and directed a number of films including The Land has Eyes set on his homeland of Rotuma in Fiji. This culturally unique narrative feature premiered at the 2004 Sundance Festival and has won several awards including ‘Best Dramatic Feature’ at the 2004 Toronto Imaginative Film and Media Arts Festival and a nomination in the Foreign Language Category of the 2005 Academy Awards. Vilsoni is currently Adjunct Professor of the Academy for Creative Media at the University of Hawaii.

Sylvia Ingemarsdotter  Sweden


Ian John  New Zealand

Ian has been involved in the film industry for over forty years, his first major editing job being the pioneering television series Tangata Whenua (1974). Other major works include Sleeping Dogs (1977) with Sam Neal, The Scarecrow (1981), Utu (second cut - 1984) and Leave All Fair (1984). He has also produced and directed documentaries such as Here is New Zealand (1984) and Waka: the Awakening Dream (1990). Ian is based in Auckland, New Zealand.

Karen Pearlman  Australia

Author of Cutting Rhythms, Shaping the Film Edit (Focal Press, 2009), Karen Pearlman is well known for her pioneering work in articulating underlying principles concerning rhythm in film. She has directed and edited numerous highly acclaimed short films, online and mobile productions and the short feature Thursday's Fictions (2006). Her recent half hour documentary …the dancer from the Dance was a finalist in the Australian Dance Awards for Outstanding Achievement in Dance on Screen, and also a finalist for an ATOM Award for Best Arts Documentary. Dr Pearlman is currently Lecturer in Screen Production at Macquarie University in Sydney, Australia.

Mary Stephen  France

An accomplished film editor based in France, best known as Eric Rohmer’s long time collaborator. Initially an assistant to Cécile Decugis (editor of Jean-Luc Godard’s Breathless) since The Aviator’s Wife (1981), Stephens became Rohmer’s chief editor in the early nineties with Winter’s Tale and edited all of Rohmer’s subsequent films until his last, The Romance of Astrea and Celadon (2006). In recent years Stephens has worked in Turkey, Canada, and China on films such as Du Haibin’s 1428 (a prize-winner at the Venice Film Festival), Lixin Fan’s Last Train Home (Grand Prize winner at IDFA) and Huseyin Karabey’s My Marlon and Brando (prize winner at the Tribeca Film Festival). She also teaches film in Australia, Canada and France.
APPENDIX IV: Editor Interview Questions

As part of the study, a qualitative research study was conducted to determine support for the proposition that editors share a unique phenomenology of the edit suite. Seven experienced editors were interviewed, Other propositions were also tested with the interviewees, including the significance of a single frame, the role of physiological resonances and ‘magic’, and the overall significance of timing and rhythm in editing.

It was interesting to note the difference between interviewing for formal research and interviewing for documentary. In the latter case, questions are generally more open-ended, and framed so that in the final edit, the question is implied in the answer. No interviewer appears in *Time Rhythm Magic*. However the various answers are grouped in the film, partly for continuity and concision and partly as a phenomenological grouping.

The interviews were not intended to investigate the sampling propositions advanced in this study.

1. Please tell us how you came to be an editor.
2. How important is timing and rhythm in the editing process?
3. In your own editing, or studies of others, have any consistent temporal patterns emerged?
4. It has been suggested that parallels exist between music, dance and editing. Is that so?
5. At a micro-editing level, how much difference can one frame make?
6. Intuition is a word editors use a lot, what exactly is the intuition an editor must have – or develop?
7. Editors often work on a cut until it ‘feels right’. How do you know when it is ‘right’?
8. How much of your editing is cognitive / thinking and how much is organic / feeling?
9. It is sometimes said that “the best editing is invisible”. Is that your experience?
10. Documentary is more likely to be viewed as ‘truth’. Does this mean that the ‘reality’ created by documentary editors is an even greater degree of illusion?
11. It is said that editors create convincing illusions that the audience believes to be real. Does this make the editor some sort of magician?
12. Does ‘magic’ ever happen in your edit suite?

The response to these questions provided the basis for the studio work – *Time Rhythm Magic: Conversations with Film Editors* submitted with this study.
APPENDIX V: Film Credits

PAST FORWARD
Screenplay by Paul Davidson
Based on a presentation by Dr Bill Metcalf
Funding support from Griffith Film School
Executive Producer: Prof Herman Van Eyken
Research: Dr Bill Metcalf, Barbara Gibb, Paul Davidson
Camera: Lachlan Hughes. Location Sound: Belinda Small
Production Management by LiveLab: Director Peter Moyes
Opening graphics and title animation: Barbara Gibb
Editing and Sound Design: Paul Davidson
Programme Consultant: Dr Pat Laughren
Written and Directed by Paul Davidson
Presented by Dr Bill Metcalf
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RAGGED BLOODY HEROES
Song written and performed by Luke O’Shea
Band: Medicine Wheel. Guitar solo: Phil Doublet
Screenplay: Paul Davidson and Barbara Gibb
Based on an original concept by Rachael Dunn
Research and Production Management: Barbara Gibb
Funding: New Zealand Returned & Services Association
Wellington scenes filmed and directed by Paul Davidson
Location Assistants: Robert Gibb, Fey Valiant, Mel Bierne
Archive Footage: NZDF Archives, Archives New Zealand
Music Production: Matt Fell, Love Hz Studios, Sydney
Technical Support: Peter Miles, Terrence Davidson
Sydney band scenes directed by Rachael Dunn
Tikanga Maori Consultant: Kiley Nepia
Editing and Sound Mix: Paul Davidson
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ONCE WERE WHALERS
Camera and Interviews: Paul Davidson.
Funding support: Marlborough District Council
Funding and Resources: NZ Department of Conservation
Whalers: Joe Heberley, John Norton, Tom Norton Peter Perano
Archive Footage: Owen Webb, Archives New Zealand
Thanks to Heather Heberley, Don Grady, Roy Grose
Whale Survey Project Manager: Nadine Bott
Editing and Sound Design: Paul Davidson
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BIBLIOGRAPHY


Battleship Potemkin, directed by Sergei Eisenstein. Film, 75 minutes (Moscow, Mosfilm, 1925)


Berlin: Symphony of a Great City, directed by Walter Ruttmann. Film, 79 minutes (Berlin: Fox Europa, 1927)


————. The Film Sense. Translated by Jay Leyda. London UK: Faber and Faber, 1943.


————. Sealers and Whalers in New Zealand Waters. Auckland, NZ : Reed Methuen, 1986.


*Koyaanisqatsi*, directed by Godfrey Reggio. Film, 85 minutes (Santa Fe, US: Institute for Regional Education, 1982)

*Le Voyage dans la Lune (A Trip to the Moon)*, written and directed by Georges Méliès. Film, 16 minutes (Paris: Star Films, 1902)


*Russian Ark*. Film, directed by Alexander Sokurov, 96 minutes. (Seville Pictures: released 22nd May 2002)


