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ARTICLE

3D UK? 3D History and the Absent British Pioneers

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The recent television 'rediscovery' of a small cohort of 1950s British 3D films (and the producers who made them) has offered a new route into considering how the historical stories told about 3D film have focused almost exclusively on the American experience, eliding other national contexts. This article challenges both the partiality of existing academic histories of 3D and the specific popular media narratives that have been constructed around the British 3D pioneers. Offering a rebuttal of those narratives and an expansion of them based around primary archival research, the article considers how the British 3D company Stereo Techniques created a different business and production model based around non-fiction short 3D films that stand in contrast to the accepted view of 3D as an American feature film novelty. Through an exploration of the depiction (and absence) of these 3D pioneers from existing media histories, the article argues for a revision to both 3D studies and British cinema history.

> Stereoscopic feature-making is really just getting into effective stride . . . Britain has been a pioneer in this medium . . . The technical excellence of British stereoscopic photography has already been proved in a number of shorts and featurettes. (*Kinematograph Weekly* 1953a: 29)

Between 1951 and 1955, British stereoscopic production company Stereo Techniques produced around twenty short 3D films and one feature (see **Table 1**). These films included 'the first 3D travelogue, the first ballet film, the first animated cartoon, the first sports film, the first newsreel, the first 3D advertising film, and so on' (Smith 1993); they played to full theatres and broke box-office records when they were shown across Britain, and were successfully distributed and exhibited across Europe, including screenings in Amsterdam, Berlin, Brussels, Copenhagen, and Paris, and several cities in the United States. With an apparently solid financial, aesthetic and technological reputation, these films – and Stereo Techniques, the company that made and distributed them – might be expected to represent a key moment in 3D history. Yet they remain a largely unknown element within the history of stereoscopic 3D, overshadowed by the American features that dominated the mid-1950s.[1]

This article, then, is in part an attempt to redress that balance and, in conjunction with other recent work on these films and time period (Easen 2003; Johnston 2011, 2012, 2015), it seeks to offer a historical and critical reappraisal of their content and production history. To aid this attempt at reclamation, the article will also critically appraise a series of 3D histories and overviews that have elided or provided specific historic stories about the British 3D experiments. As such, the article is an exercise in both historiography and historiophoty, considering the 'processes of condensation, displacement, symbolisation, and qualification' (White 1988, 1194) found in two filmed documentaries *The Queen in 3D* (Channel 4, 2009) and *Trevor McDonald's Queen & Country* (Sky 3D, 2012)

[1] The absence of the British films from historical overviews of 3D mirrors the absence of the European and Russian experiments that preceded them.

Film	Key Personnel	Format	Production Company / Sponsor / Client
	1951		
Now is the time (to put on your glasses)	Norman McLaren (D) John Halas, Raymond Spottiswoode (P, S)	Colour	British Film Institute National Film Board of Canada
A Solid Explanation	Peter Bradford (D) Raymond Spottiswoode (P, S)	B&W	British Film Institute Pathé Documentary Unit/Associated British-Pathé (AB-Pathé)
Around and Around	Norman McLaren (D) John Halas, Raymond Spottiswoode (P, S)	Colour	British Film Institute National Film Board of Canada
Distant Thames / Royal River[2]	Brian Smith (D) Raymond Spottiswoode (P, S)	Colour	British Film Institute International Realist
	1952		
Sunshine Miners	Jack D. Chambers (D) Charles W. Smith (S) Raymond Spottiswoode (P, S)	B&W	Stereo Techniques Data Film Unit National Coal Board
Northern Towers	Roy Harris (D) Charles W. Smith (S) Raymond Spottiswoode (P)	B&W	Stereo Techniques Shell Film Unit
Around and About *1: Port of Liverpool* *2: Square Dancing in Hammersmith*	Danny Carter (D) Christine Bruce (P) Charles W. Smith (S)	B&W	Stereo Techniques Christine Bruce Productions
The Black Swan	Leonard Reeve (D) Jack Ralph (AP) Raymond Spottiswoode (P)	B&W	Stereo Techniques Anglo-Scottish

(**Contd.**)

Film	Key Personnel	Format	Production Company / Sponsor / Client
	1952		
Eye on the Ball	Peter Bradford (D)	B&W	Stereo Techniques Pathé Documentary Unit / AB-Pathé
Flying Carpet	Raymond Spottiswoode (P)	B&W	Stereo Techniques Unknown (possibly a commercial film)
	1953		
Air Junction / Airport		B&W	Stereo Techniques Anglo-Scottish
The Owl and the Pussycat	John Halas / Brian Borthwick (D) Digby Turpin (S)	Colour	Stereo Techniques Halas & Bachelor
Summer Island	Robert Angell (D) Charles W. Smith (S)	Colour	Stereo Techniques Film Partnership / Madeira Wine Ltd.
Vintage '28	Robert Angell (D) Jack Ralph (AP) Godfrey Jennison (S)	B&W	Stereo Techniques Film Partnership
Bullfighting in Spain / Festival in Spain	Unknown	B&W	Stereo Techniques Unknown
London Tribute	Robert Angell (D) Jack Ralph (AP) Raymond Spottiswoode (P) Ken Nyman	B&W	Stereo Techniques Unknown (presence of Ralph and Angell could suggest Film Partnership)
Royal Review	Robert Angell (D) Arthur Wooster (C) Charles W. Smith (S)	Colour	Stereo Techniques AB-Pathé

Film	Key Personnel	Format	Production Company / Sponsor / Client
	1953		
The Real Thing	Ralph Thomas (D) J. Henry Piperno (P) Charles W. Smith (S)	Colour	Stereo Techniques TP Production / John Haddon Advertising Agency / Capstan Cigarettes (client)
	1954		
Ring Up the Curtain	Charles W. Smith (S)	Colour	Stereo Techniques Theatre Publicity Ltd. Thomas French & Sons (client: curtain company)
Kellogg's Corn Flakes	Unknown	Colour	Stereo Techniques Kellogg Company
The Diamond / The Diamond Wizard	Montgomery Tully / Dennis O'Keefe Raymond Spottiswoode (AP) Charles W. Smith (S)	B&W	Stereo Techniques Gibraltar Films Ltd.
	1955		
Power in Perspective	Alan Pendy (D) GL Weinbren (D) Raymond Spottiswoode (P)	Colour	Stereo Techniques Shell Film Unit

Table 1: Stereo Techniques: list of films and production partners (D: Director; P: Producer; AP: Associate Producer; C: Cinematographer; S: Stereographer).[3]

[2] *Distant Thames* (1951) was the title of the film when it debuted (incomplete) at the Festival of Britain in May 1951. A completed version of the film, now entitled *Royal River* (1951) and featuring final images of London during the Festival of Britain, debuted at the Edinburgh Film Festival in August 1951.

[3] The information in this table is drawn from a variety of sources, including the credits of the individual films (where available), Hayes (1989), Smith (1987, 1993), the British Film Institute database, and primary reports in *Kine Weekly* and *The Times*. Many of these sources overlap and there are occasionally disagreements (there is little or no information on *Flying Carpet* [1952] or *Bullfighting in Spain* (1952), for example). However, the table remains an attempt to offer the fullest record possible of Stereo Techniques' activity in the 1950s.

and three written sources Hal Morgan and Daniel Symmes' *Amazing 3D* (1982), R.M. Hayes' *3D Movies: A History and Filmography of Stereoscopic Cinema* (1989) and Ray Zone's *Stereoscopic Cinema and the Origins of 3D Film* (2007). While a fuller list of stereoscopic films can be seen in **Table 1**, these aforementioned five sources reveal the creation of two similar limited stories about the British 3D pioneers and their place within the broader sweep of stereoscopic 3D history: stories that the article will challenge by developing and presenting alternative archival evidence from a range of primary sources designed to give a more rounded account of the 1950s British 3D.

While the focus of the article necessarily falls on the engineers, producers, and filmmakers involved in these British experiments, it is not a study of the specific stereoscopic technologies, patents or camera rigs created. That is not to reduce the importance of the different mechanical set-ups that were created and designed by these individuals but it allows the article to bypass issues of mechanical patents and theoretical equations in favour of a closer examination of the absence of these men (and they are all men) and this company from film history. That absence occurs across different categories within media studies: British media history has little or no mention of British 3D innovation; technological media histories focus on 3D as a recurring (American) failure obsessed with gimmickry; while recent discussions of digital 3D media pass over analogue 3D film as if it were the black sheep of the family, anathema to the continued success of the current digital stereoscopic boom.

The elision of the British pioneers can, in part, be linked to Stereo Techniques' choice of production material. Short films, often documentary or artistic in nature, were chosen as subjects rather than a feature-film project: the status of the feature vs. the short film in film studies more generally already reduces the focus on such work. Yet such explanations reveal only one facet of this absence. While the British film industry has successfully promoted its technical abilities in camerawork, special effects, and production design, technological skill has rarely featured in British cinema studies; equally, while 3D may have claimed to expand realism, its popular

and scholarly reputation is based more around visual breaches of the z-axis, exploiting negative parallax to project objects 'out' of the screen and into the audience. This sense of 3D technology offering spectacular attractions has clashed with the preferred reputation of British cinema as social realist and restrained. To borrow a famous phrase from British cinema history, stereoscopic 3D has arguably been seen as containing too much tinsel, and not enough realism.

Britain's absence from stereoscopic 3D history can also partially be explained by the reluctance of the academy and popular discourse to take 3D seriously as a historical topic and contemporary fact within current media industries. Although significant academic work has recently considered the place of digital 3D in film production, exhibition and aesthetics (Acland 2010; Elsaesser 2012; Higgins 2012; Purse 2013; Ross 2015; Tryon 2012), little historical work has been done that challenges or opens up the dominant narrative about analogue 3D's recurrent failures. By focusing on the elision of the British 3D pioneers' attempts to popularise stereoscopic filmmaking in the early 1950s, this article challenges the broader absence of historical work around the different global 3D experiments of the twentieth century. As a counterpoint to that tradition, this article's reconstruction of Stereo Techniques allows it to explore the role of technology in British cinema studies, the place of innovators such as those who founded Stereo Techniques, what it means to study a company judged to have 'failed,' the lack of international perspectives on the development of 3D outside America, and the problem of (re)assessing British film history in the face of two dominant narratives: existing 3D history and the versions of history modern British media tells about its past.

British 3D history in media and popular sources

> The meaning of the past . . . cannot be gathered by looking at the past as it is in itself but only looking at the past as it has been written about or talked about by somebody . . . what we call the past is a story of fables to which people, for some obscure reason or other, have given their assent. (Munz 1997: 854–5)

In November 2009 the British broadcaster Channel Four devoted part of its schedule to a series of programmes about stereoscopic 3D. Alongside 3D films as diverse as *Flesh for Frankenstein* (1973) and *Hannah Montana: Best of Both Worlds* (2008) was a two-part documentary, *The Queen in 3D* (2009). Specially commissioned for this season, it purported to reveal a hitherto unknown piece of British cultural and cinematic history: a lost 3D film of the Queen's 1953 Coronation called *Royal Review* (1953).[4] Alongside a broad overview of the royal family and post-war British society, the programme offered a particular representation of Britain's 1950s experiment with stereoscopic film production. Three years later, British pay-per-view channel Sky 3D revisited the same film and era in 'Royal Visits,' the second part of *Trevor McDonald's Queen and Country* (BSkyB 2012). Both documentaries present subtly different stories about this period in history, about the technology under discussion, and the place of British inventors and filmmakers in the larger scheme of 3D history. As this section will reveal, the stories being told offer alternative versions of the history of the British pioneers, with notable elisions and stresses that work to define public perception of 1950s British 3D.

Central to the narrative of the first of the two-part Channel 4 documentary is British 3D film *Royal Review* (1953). Clips from several other British 3D films are shown in the second part, notably *Sunshine Miners*, *Northern Towers, Around and About*, *Eye on the Ball*, *Air Junction* and *Summer Island*. The emphasis here, then, is on the documentary-led films that purport to show an aspect of British society: even when a clip from Stereo Techniques' 1952 ballet adaptation *The Black Swan* appears, it is used to emphasise the place of ballet and leisure in British society, rather than the film's stereoscopic aesthetic and use of depth cues to create a 3D ballet. Throughout, these British 3D films are not seen as Charles W. Smith's 'world's firsts' but are depicted as naive and misguided; this is not a revolution in screen technology but a minor blip on the road to the important American 3D features. The programme also vastly reduces the role of original pioneers such as Raymond

[4] The season also contained *Derren Brown Presents the 3D Magic Spectacular*, *10 Greatest 3D Movies*, *The Greatest Ever 3D Moments*, *Friday the Thirteenth Part III* (1983), special Channel Four idents in 3D, 3D sponsorship tags and 3D advertisements.

and Nigel Spottiswoode, and of Stereo Techniques. The opening voiceover reveals the programme's preferred focus on 'two young men . . . experimenting with a revolutionary new technology,' namely two surviving filmmakers, director Robert / Bob Angell (director of *Summer Island, Vintage '28, London Tribute* and *Royal Review*) and cameraman Arthur Wooster (who worked on *Royal Review*). While television documentary filming tends to focus on interviews, preferably those that have been specially filmed for the programme, the absence of alternate voices or stronger archival work helps shape the version of history the programme chooses to depict.

In place of technological innovation by talented engineers and filmmakers, the programme reverts to a tired stereotype of the British boffin. The programme shows Angell and Wooster messing around in a cluttered garage / shed, with talk of lashing two cameras together in order to film the Coronation and other royal events. The result suggests *Royal Review* was accidental, slapdash, a Heath Robinson-or Wallace and Gromit-style narrative of blind optimism and bodge jobs rather than a professionally planned and executed production overseen by Smith. Here, British cinema is reduced to less than a cottage industry, while the American 3D features, the only real point of comparison, are slick and competent: equally, while Stereo Techniques is elided, American studios are feted. According to a 1993 interview with Smith, *Royal Review* was Stereo Techniques' most well-equipped shoot, featuring a revised version of a camera produced for the Festival of Britain (known as the BFI camera), a second, new, assembly of twin Newman-Sinclair cameras that was prepared by Pathé, and the Stereo Techniques' 'Spacemaster,' its new twin Cameflex rig specially built in Hollywood (Smith 1993). This set-up allowed Stereo Techniques to have three fixed viewpoints along the Coronation route, and at other locations in the weeks following: evidence the company took a professional approach to such filming, not the slapdash option suggested by the documentary.

Aside from issues of personnel and technology, the programme depicts the British Film Institute through standard archive imagery: rusted, battered film cans, light flickering out of a 35mm projector, vast shelves of metal film canisters stretching into the distance. While this can be read as a reductive view of the BFI or the National Film and Television Archive, it clearly contrasts the old (analogue, linear)

with the new (digital, non-linear): a comparison made concrete when the programme voiceover asserts 'For half a century the results of their experiment were buried in these film canisters . . . when researchers opened these cans they were astonished to see footage of the Queen from 1953 in colour and 3D. It was one of the film finds of the century.' This notion of discovering rare antiquities, of presenting a film that is 'part of a treasure trove of 3D newsreels recently unearthed deep in the vaults,' is inaccurate. Any claim of showing *Royal Review* 'for the first time' on television would likely belong to the 1980s, when 3D clips were shown on television programmes highlighting the return of 3D to cinema in the early part of that decade; while the film was screened in 3D at a 1980s German film festival and at the 3D Expo in Los Angeles in the early 2000s (Johnston 2013). Therefore, the film was hardly 'buried' in film canisters or the source of astonishment.

Describing the films as newsreels is also an inaccurate labelling, since only two of Stereo Techniques' films fit that broad definition. As noted in **Table 1**, the films span multiple formats and genres. While the programme later adjusts this claim of newsreel filming, referring to Angell and Wooster as 'documentary filmmakers' who wanted 'to harness the power of 3D to bring viewers face to face with the everyday wonders of modern Britain,' it once again elides the central role of Spottiswoode, Smith and Stereo Techniques by claiming the films represent how Britain 'looked to Bob and Arthur.' While Bob Angell did direct several of the 1953 films, he was not involved in *A Solid Explanation, Royal River, Sunshine Miners, Northern Towers, The Black Swan* or *Eye on the Ball*, which feature in the programme: a prominent example of a linear history simplifying and focusing on an individual's role. As will be discussed below, Angell and Wooster were not the driving forces on either the management or creative side of the British 3D business that actually produced these films.

While I am reluctant to get into an argument over the 'correct' way to read history, *The Queen in 3D* does make an attempt to reintroduce the British 3D experiments to a broader audience; and Bob Angell briefly mentions how he was part of an inexperienced and 'newly formed documentary company.' In comparison, 'Royal Visit,' episode two of the Sky 3D documentary series *Trevor MacDonald's Queen and Country*, reduces this linear narrative even further, while being reliant on similar claims and

interviews. *Royal Review* remains the focus; there is little mention of *London Tribute*, Stereo Techniques' second 3D newsreel, of Queen Mary's funeral; it highlights 'two young cameramen' who were 'experimenting with a new technique' using 'a home-made rig' with 'a great deal of luck'; new interviews with Angell and Wooster are foregrounded; and the films are described as 'forgotten about for almost sixty years.' The programme revisits almost every beat of the first part of *The Queen in 3D*: the main difference is the treatment of the BFI. Here, it is depicted in light of a new high-tech archive facility in Warwickshire which will 'preserve millions of moments of time . . . the best versions of what really matters.' That last comment, given the 'best version' of history the programme is constructing, is particularly telling: while Jan Faull talks about the BFI's involvement in funding the initial four Telekinema 3D films, she is not given an opportunity to correct the mis-representation of 3D history taking place elsewhere in the programme.

Both programmes restrict the historical narrative that can be built around Stereo Techniques to one film of the Coronation and the associated documentary-led projects: *The Queen in 3D* makes no reference to the animated McLaren films, or the Halas and Bachelor animation *The Owl and the Pussycat*, which fall outside the borders of its linear and limited focus on a 'lost British culture of the 1950s.' The insistence on British 3D as naive young men playing with technology ignores the industrial role that Stereo Techniques played. It was not content to simply produce the same documentary material and work with the same documentary companies, hoping to break into more mainstream work: a test at Ealing Studios using the company's Newman-Sinclair camera-rig was described as 'quite outstanding,' while a similar colour test of the new Cameflex Spacemaster rig at ABPC Elstree (shot by director of photography Irwin Hillier) was considered 'an outstanding piece of work' (Cricks 1952: 31).

The narrative that *The Queen in 3D* and *Trevor McDonald's Queen & Country* construct between British 3D and the documentary movement may be partial, and may lack historical rigour, but it offers a more positive and informed depiction than other popular historical sources. One of the first book-length studies of 3D (Morgan and Symmes 1982) attempted to revise the wider lack of historical work

on the technology through a cross-media approach that explores the place of 3D in popular culture, including Victorian stereography, domestic photographic cameras, Hollywood films, comics, and magazines. When it introduces a standard 1950s 3D narrative by discussing the *Bwana Devil* (1953) premiere, the book makes the following note:

> Though 3D films were by no means new to Hollywood – Pete Smith's *Audioskopics* had been quite popular in the 1930s – they had been missing in action since the start of World War II. The European success of the Dutch short *Queen Juliana* in 1948, and of the Spottiswood [sic] brothers' shorts for the 1951 Festival of Britain received little attention from the American industry. (Morgan and Symmes 1982: 54)

Apart from a 3D film chronology in the appendices (which lists nine Stereo Techniques shorts) this is the sole reference to the British experiments. As is clear from the excerpt, the sidelining of 'European' 3D can be broadly taken for all non-US 3D, given that the German and Russian 3D films of the 1930s and 1940s are also summarily dismissed. Despite the international development and application of 3D, the book positions the cinematic technology as almost exclusively American in nature. This elision is not restricted to Morgan and Symmes: it can also be found in other publications of the early 1980s, when 3D films had returned to cinemas: special editions of popular fan magazines such as *Cinefantastique* (1983) and *Starlog* (1982) offer encapsulations of 3D history that jump from Russian lenticular 3D of the 1940s to *Bwana Devil* and *House of Wax* (1953), and offer a limited Filmography that, again, stresses feature production over short film. The dominance of the feature in both popular and academic film writing works to reduce the importance of the British films, even as the stress on American 3D reduces the complexity of the international history of the technology.

The more rigorous survey of stereoscopic cinema found in R.M. Hayes' 3D history and filmography (1989) gives more time to the European experiments, noting the French, German and Hungarian work, and commenting that 'the British

contributions to stereo-vision movies have too long been overlooked' (Hayes 1989: 19). Hayes does not tackle that oversight and, although it contains a more comprehensive listing of the British films to date, the book gives no real sense of the history behind the British pioneers or their films: it remains an awareness of the absence, not an attempt to fill it. More recently, Ray Zone's work can be read as a counter and deepening of both 1980s books' view of history, describing 'four general periods' of stereographic history: Novelty (1838–1952), Convergence (1952–85), Immersive (1986–2007) and Digital (2005–present) (Zone 2007: 1–4). His book focuses on the first category and develops a historical narrative that is alert to the international nature of the technology. Zone's discussion of Stereo Techniques, however, is a brief note that the 1951 shorts 'marked the end of the novelty period of stereoscopic cinema . . . with the stereographic animation of Norman McLaren, there was no question that 3D motion pictures had at last achieved the status of art' (Zone, 2007: 179). Aside from the problematic assumption that all of the Stereo Techniques' 3D films can be dismissed as 'novelty' – an assertion based solely on the 1951 Festival of Britain films – Zone reduces the complexity of the British experiments to a claim for artistry through stereoscopic animation, again ignoring the history of Stereo Techniques and the contributions of individuals such as Spottiswoode or Smith.

All three books, then, reinforce a historical narrative that dismisses the British work and success, creating a history of absence, oversight and reduction. As Brannigan has noted in relation to the history of colour technology, many historical narratives ignore complexity in favour of linearity and notions of evolution, 'located in a point: a decisive event, the genius of an individual, a revolutionary invention' (Brannigan 1986: 125). It is clear that in these three written 3D histories (and other popular articles) that event remained the American production and release of the feature *Bwana Devil*, and its director Arch Oboler. Given both American and British 3D processes built on the work of Professor John T. Rule's stereography research (Zone 2007: 170–71), Oboler was no more the inventor of a completely new stereoscopic process than the Spottiswoode brothers were. Yet Oboler's film is the decisive point identified in these histories, the first act of the 3D boom narrative. Despite the expansive scope of these books, American 3D features dominate the history created, a simple linearity

that smoothes over the complexities of 3D history and reinforces the idea that 3D has a 30 year cycle of returning to the mainstream: a narrative that ignores the role of 3D in other national contexts in the 1930s, Russia in the 1940s, American genre films of the 1960s, soft-core pornography in the 1970s, and theme park rides of the 1980s and 1990s. Equally, the popular picture of 3D history becomes intrinsically linked to other historical 'stories': the rise of television, the decline of cinema audiences, and the introduction of other screen technologies such as Cinerama and CinemaScope. 3D's apparent 'failure' of the 1950s is easily linked to more outrageous gimmicks such as AromaRama, Smell-O-Vision, Hypno-Vision et al., further reducing any potency that stereoscopic technology might attain. It remains a novelty, never a necessary technological step forward for cinema's artistry.

Throughout all of the historical narratives constructed in these media and popular sources, then, the place of the British pioneers is elided, misunderstood, or partially represented. In comparison with the written sources, *The Queen in 3D* and *Trevor McDonald's Queen & Country* at least offer a reassessment and expansion of knowledge around these early experiments. However, as the next section will demonstrate, that reassessment is open to challenge based on a closer examination of varied historical documents such as the contemporary trade press, the films themselves, and interviews with now-deceased filmmakers.

The British 3D Pioneers: A Revised History

> In Britain we are sometimes backward in boasting about our achievements. So let us say here quite bluntly that the British invented 3D, the stereoscopic movies we know today. (Smith 1987: 26)

Raymond Spottiswoode. Nigel Spottiswoode. Charles W. Smith. Jack Ralph. Ken Nyman. These five names, and Stereo Techniques, the company they established, were the key players in British 3D in the 1950s. Largely absent from existing 3D histories, they are equally absent from histories of British cinema of the 1950s, despite the first films debuting in 1951, a 'pivotal year for British society, marking a shift from a period of post-war austerity . . . to the consumer boom of the 50s . . . [and] a turning

point for the film industry in general' with the X certificate, an influx of European art cinema, and competition from television (Cook 1986: 355). The Stereo Techniques 3D films exist on the cusp of that change, harking back to the world of the sponsored commercial documentary (*Sunshine Miners, Northern Towers, Power in Perspective*) and traditional views of England (the Thames in *Royal River*, football and cricket in *Eye on the Ball*), while also looking forward to the rise of the teenager (dancing in Hammersmith Palais in *Around and About*), greater female independence (*The Real Thing, Royal Review*), and a technological future (*Northern Towers*).

The films' stereoscopic documentary depictions of 1950s British society represent one important part of Stereo Techniques' business model: the development of sponsored documentaries that, to adapt John Grierson's phrase, explored the stereoscopic treatment of actuality. Alongside this model, however, were attempts to use 3D artistically in both animation and live action, experiments with commercial usage in adverts for Capstan Cigarettes and Kellogg's Cornflakes, and a move into drama with a drama-documentary short and 1954 feature. As demonstrated above, the historical narratives constructed around Britain's first 3D production house elide the complexity of their productions in favour of the easier, linear connection to the social-realist documentary heritage of the British film industry. Through this section, a range of primary and secondary sources are used to construct an alternative story around these 3D pioneers that explores the set-up, intention and eventual fate of Stereo Techniques. These materials include primary publications such as *Kinematograph Weekly, Ideal Kinema, Picturegoer, Sight & Sound* and the Edinburgh Film Festival materials held by the National Library of Scotland, and secondary sources such as a BECTU interview with, and a series of articles by, Charles W. Smith, one of the 1950s stereoscopic pioneers. These latter materials provide an additional perspective that contributes to a broader picture of the past even if such reminiscences are 'widely influenced by their personal interests and abstractions' (Munz 1997: 854) and as open to challenge as the interviews with Angell and Wooster criticised above.[5]

[5] For many years, Smith was a lone voice in British 3D history, publishing articles in technical journals through the 1970s, 80s and 90s that stressed the role of the 1950s innovators and their relationship

Assembling its own story from these archival sources (including the films themselves) allows this article to reflect on the issues inherent in such construction (not least the gaps that remain in the historical record), and its departure from the broader overviews discussed above. It is the contention of this article that this alternative narrative is a necessary step to challenge and understand the stories found in those programmes, which presented British 3D as a shambolic, quaint and naive cottage industry subsumed by America and forgotten by history. While that reclamation and revision has begun elsewhere, notably around exhibition (Johnston 2011) and the aesthetics of 3D landscape (Johnston 2015), this article's focus remains on the personal and industrial context of British stereoscopic filmmaking: the men who helped set the 1950s 3D boom rolling, the companies they established, and the films they produced. While these materials are dominated by men, it is not the intention of the article to replace the existing partial narratives with a 'Great Man' theory of history, but to suggest ways in which these historical sources necessarily complicate the linear histories that exist.

To begin this alternative history, Raymond Spottiswoode (1913–1971) was handpicked by the British Film Institute to lead the production of special films for the purpose-built Telekinema at the 1951 Festival of Britain. Spottiswoode, an Oxford graduate who had worked as a reader for MGM in Hollywood, became technical head of the National Film Board of Canada in the early 1940s, also directing films such as *Guards of the North* (1941) and *High Over the Borders* (1942). Lured back to Britain for the Festival, Spottiswoode recruited his engineer and mathematician brother Nigel (who had been experimenting with 3D photography) to produce the necessary theoretical equations and mechanical knowledge to produce a series of short stereoscopic films (Smith 1993). Working with stereoscopic enthusiast Lesley Dudley, and different production companies (see **Table 1**), Spottiswoode was able to present a series of stereoscopic and stereophonic films at the South Bank Telekinema. The success of the first four stereoscopic films included sold-out performances at both the Festival of

to the American-dominated 3D industry that followed. While Smith's recollections are as partial as the other sources considered here, his effort in keeping British 3D visible should be noted.

Britain and the 1951 Edinburgh Film Festival, and this encouraged the Spottiswoodes to distribute these films more widely and pursue more stereoscopic productions. As they had experienced difficulties working with Dudley, who publicly disputed the Spottiswoodes' decisions and approach to 3D, the brothers established Stereo Techniques Limited in association with Jack Ralph. Another ex-National Film Board of Canada producer, who was also associated with documentary company Anglo-Scottish, Ralph had been appointed by the BFI to oversee 'all Festival film arrangements' (Eason 2003: 52), and brought a range of industry contacts to Stereo Techniques.

Raymond Spottiswoode worked as the main stereo consultant on the early films, supervising each shoot, controlling 'the depth content of each scene, in discussion with the director . . . and [setting] the stereoscopic adjustments of the camera' (Smith 1993).[6] While working on *Sunshine Miners* in 1952 he met Charles W. Smith (1921–2004), the assistant to director of photography Wolfgang Suschitzky. Spottiswoode, impressed with Smith's work and eagerness for the process, offered him a job: after extensive training in 'the theories of image formation and the use of the stereoscopic adjustments on the camera,' Smith became Stereo Techniques' main stereo consultant (Smith 1993). With Smith and others, the Spottiswoode brothers developed several camera rigs during Stereo Techniques' tenure: the BFI camera rig was developed with Lesley Dudley, and revised in late 1951; there was a Technicolor rig built for *Royal River*; and a twin 35mm Cameflex rig built for the Coronation filming that became *Royal Review*. This latter rig (intended to be more lightweight and portable for location shooting) was constructed in Hollywood and overseen by Smith, after Raymond Spottiswoode was injured in a car accident (Foster). Spottiswoode also received a grant from the National Research Development Corporation (NRDC) to produce a special 3D camera, the Spacemaster, that was used to film *The Diamond Wizard* (1954) and *Power in Perspective* (1955) in Britain, and then *The Mask* (1960), a Warner 3D film produced in Canada (on which Smith was stereoscopic advisor).

[6] Although he remained a director of the company, Nigel was not active in production, being more interested in the technical and theoretical side of stereoscopy.

Stereo Techniques was a small but effective business, driven by a simple model. It would provide stereoscopic equipment and expertise, and would develop short projects of five to fifteen minutes' duration alongside existing production companies. From the start, this included a wide range of artistic and documentary projects: the National Film Board of Canada was co-producer on the Norman McLaren films *Now is the time (to put on your glasses)* and *Around and Around*,[7] described as 'the first work of art for the stereoscopic cinema' (Smith 1993); Associated-British Pathé / Pathé Documentary Unit co-produced *A Solid Explanation, Eye on the Ball* and *Royal Review*; while *The Black Swan* and *Air Junction* were co-productions with Anglo-Scottish. Within this arrangement, Stereo Techniques used their technological knowledge to retain final approval on all shorts, 'to ensure that the stereoscopic content would be satisfactory' (Smith 1993). Crucial to the success of the venture was the creation of a nascent 3D distribution and exhibition network: from small beginnings at special events in London and Edinburgh in 1951, Stereo Techniques installed and trained projectionists in over 30 public cinemas from Liverpool and Brighton to Cambridge and Southampton (for more on the Stereo Techniques exhibition network, see Johnston 2011). The company's intent appears to have been vertical integration, an approach that could be seen as an early precursor to an organisation such as the IMAX Corporation, whose 'monumental documentary . . . films feed the core of the business, which is leasing and maintaining the technological infrastructure itself' (Acland 1998: 431–2). Whereas IMAX's documentary approach (which expanded to include 3D documentary) was initially designed to serve its traditional sites in museums or institutions, Stereo Techniques tested their films and technological product in the existing exhibition sector, with differing results.

Given its expertise in screen installation, projectionist training, projector synchronisation, and distribution of prints within Britain and across Europe, Stereo Techniques has to be understood as more than just a production house. Yet its

[7] NFB and McLaren produced other stereoscopic shorts *O Canada!* (1952) and *Twirligig* (1952), apparently without any additional input from Stereo Techniques.

success within the historical record rests on three elements: the artistic and technical quality of the films it made; the financial success of the films and company; and (perhaps most problematically) the impact Stereo Techniques had on the future success of 1950s 3D in America. As the opening epigram from *Kinematograph Weekly* suggests, the British 3D short films had displayed 'technical excellence' (*Kine Weekly* 1953a: 29), while their aesthetic content had been hailed for the attempt to enhance realism (and restrict the usage of negative parallax) yet criticised for not embracing the world of the feature film and presenting star images (Johnston 2012). Financially, the company followed a 'conservative, very British . . . nothing too ambitious' policy (Smith 1993), but tended to make its money back on the films: *The Black Swan*, for example, which adapted a short sequence from *Swan Lake* featuring ballerina Beryl Grey, recouped its production costs in nine months (Brunel 1953: 230). Although aiming at a vertically integrated model, Stereo Techniques was reliant on a distribution and exhibition approach that required a programme of four to five short films to be packaged together, meaning that the initial outlay (although shared with partners) was higher. Ironically, the initial success of the American feature films (notably *Bwana Devil* and *House of Wax*) led to several Stereo Techniques films being shown on a much wider theatrical circuit before the main feature. *The Real Thing* (1953), a stereoscopic commercial produced by Stereo Techniques for Capstan Cigarettes, benefited from this wider exposure and several critics commented it was better than the film it preceded (Johnston 2012).

The relationship between Stereo Techniques and the subsequent American revival of 3D is more uncertain but also historically disingenuous. Hayes (1989) and Zone (2007) disagree on this point: Hayes sees the distribution of *3-Dimension* (1952), a compilation of Stereo Techniques films by Sol Lesser, as a key indicator that some influence can be claimed, notably on Arch Oboler but also upon the other Hollywood directors and producers who chased the 3D boom. Zone, challenging that, notes the development of American 3D systems through the 1940s and the early years of 1951, rather than any outside influence (Zone 2007: 178). Both agree that the term '3D' appears to come from Raymond Spottiswoode, who was looking for an easy way

to say 'three' or 'third dimension' when discussing the films; that the October 1952 Spottiswoode and Smith article on the 'Basic Principles of the Three-Dimensional Film' (published in the *Journal of the Society of Motion Picture and Television Engineers*[8]) offered the strongest theorisation of the process yet; and that Spottiswoode was elected a Fellow of SMPTE for his work in stereoscopic theory and production, serving as a member of the American SMPTE Committee on Stereo Motion Pictures (Zone 2007: 178). Beyond this, there is little agreement or historical evidence to suggest a direct relationship. Spottiswoode himself noted that 'American producers had "played 3D for a fast buck"' by focusing on gimmick over content, and suggested that a similar error was avoided in Britain 'by exercise of a peculiarly English trait: the producers showed no interest whatever in any new techniques' (*Kine Weekly* 1953b: 7).

The search for influence or specific temporal relationship highlights the same fallacy as Brannigan encountered when researching colour film history: separate narratives (the British experience and the more widely known American experience) are simplified, collapsed and condensed into a linear narrative that ignores complexity and difference in favour of a cause-and-effect narrative about '1950s 3D.' As this article has argued, through Stereo Techniques the British 3D pioneers established and promulgated a successful (albeit small scale) stereoscopic production, distribution and exhibition network across Britain, and made inroads into Europe and the United States. To see this as relevant only in terms of its impact on *Bwana Devil* and the other US productions is to ignore the importance of that moment for debates around national media and the wider global development of stereoscopic media technology.

Of course, the alternative historical narrative of Stereo Techniques that has been briefly sketched out through this section is also partial and condensed, based on those research materials but lacking others. Access to the financial or company records of Stereo Techniques, or precise box office returns, for example, would confirm the status of the company, more fully flesh out the roles played by Ralph or Nyman, and reduce the need to rely on Smith's recollections of the time period (his memory may

[8] The article was also given the 1952 SMPTE journal award for paper of the year – according to Smith, the first time this award had been given to a non-American paper (Smith 1993).

be as partial as that of Angell and Wooster). The fate of Stereo Techniques is also open to speculation: the company's final film appears to be *Power in Perspective* (1955), a co-production with Shell Film Unit, but there is no extant print of the film and paper records from the period make no reference to it. Raymond Spottiswoode's post-3D career included more industrial documentaries, producing *Forming of Metals* (1957) with the Shell Film Unit / Film Centre and *Business Goes By Jet* (1963) with Film Centre / DeHavilland, among others. As noted above, Charles W. Smith continued to work in 3D production over the next four decades, and was an avid promoter of its aesthetic and technological possibilities. Even given the scant knowledge available on the creation and ultimate fate of Stereo Techniques and its owners, it remains clear that the historical narrative that can be constructed from the range of sources utilised here is more rich, complex and multi-faceted than that allowed for in the standard written and visual histories. As such, this alternative narrative opens up Stereo Techniques and British 3D as topics worthy of further study.

Conclusion

> The past is real enough. But the stories we tell about it are constructions . . . no amount of looking at the past can tell us whether we should pursue explanation or interpretation, or both (Munz 1997: 867)

In pre-2010 film history, stereoscopic 3D rated as little more than a brief note, a cautionary tale of a 1950s technological false start, a step too far down the industrial novelty route that was overtaken by the wider screens of CinemaScope rather than the stereoscopically 'deeper' ones offered by *House of Wax* and *Kiss Me Kate* (1953). Reduced to a legend built around thirty-year cycles of failure, analogue 3D is now (in the light of digital 3D success and apparent longevity) ripe for fuller rediscovery and expansion. Daniel Symmes has noted that the current American-based 3D industry initially appeared eager to distance itself from its analogue history, wary of being tarred by association (Symmes 2010). The recent release of 3D Blu-Rays of 1950s 3D films such as *Dial M for Murder* (1954) and *Creature from the Black Lagoon* (1953) suggests that strategy may be shifting.

The presence of a revitalised industrialised (and commercialised) interest in the American features of the 1950s is, however, only one step in any revisitation of 3D history and this article has argued that any concerted attempt to reassess 3D history must, of necessity, move beyond the traditional American examples. While some academics have made inroads here, piecing apart earlier examples from Victorian stereoscopy, or the national contexts of German or Russian stereoscopy, the British pioneers remain a strong and under-explored part of that richer tapestry of 3D history. In the space of four years, Stereo Techniques produced between 20 and 25 short films, and one feature, that were seen around the world; the founders offered new approaches to existing formats and genres, arguably across a wider range than the features that followed; the documentary films that were produced attempted to balance competing issues of social realism and visual spectacle; and, as engineers, they designed and developed the most advanced 3D cameras of the period. While the article has remained conscious of overemphasising the contribution of one company within the wider scope of 3D history (and ignoring other experimenters of the period such as British filmmaker Leslie Dudley), it has underlined the importance of understanding the specificity (and complexity) over the desire for a broad master narrative.

Histories of technology have to be conscious that technology itself 'is not neutral or spontaneous but is a product of social and economic circumstances and only secondarily of great men' (Brannigan 1986: 128). While this article has been guilty of focusing on a series of men, that in no way denies that the circumstances underpinning the development of British 3D were rooted in post-war Britain and the desire of the Festival of Britain to project a new vision of Britain to itself and the world. What this article has demonstrated, however, is that broadening out the current conceptions of analogue 3D history (American, novelty-based, cycle of thirty-year failures) will involve closer examination of such individuals, companies, camera rigs, national contexts and finished films, through primary and archival research that can reclaim these currently hidden or absent pioneers. Only by embracing the complexity of analogue 3D history can the opportunities offered by digital 3D be fully understood and developed.

Competing Interests

The author declares that they have no competing interests.

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