



AIRSHIP DREAMS: ESCAPING GRAVITY



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Edited by Annie Bacon and Mike Stubbs

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CONTENTS

- 
- 5 **Notes to the reader**
Annie Bacon and Mike Stubbs
- 6 **Part 1 Histories**
- 8 **The R.101**
- 13 **Imperial Monstrosities**
Martin Mahony
- 23 **Arms Race**
Jürgen Bleibler
- 34 **Technological Utopianism**
Felix Banzhaf
- 42 **Part 2 Sheds**
- 44 **Moving Sheds**
Alastair Lawson
- 49 **Keeping the Story Alive**
Lydia Saul
- 53 **A Home for the Airship**
Elaine Midgley
- 56 **Part 3 Dreams**
- 58 **Airship Dreams: Escaping Gravity 2021**
- 62 **Diary of an Artwork**
Annie Bacon and Mike Stubbs
- 68 **Telling Stories**
Lydia Saul
- 75 **Airship Dreamers Club**
Kayte Judge
- 78 **Game Changers**
Roland Denning, Roger Illingworth, Dave Lynch,
Rob Strachan, Mike Stubbs and Sam Wiehl



I am your compass
I sense the weight of your body
This body and land I will conquest
Your fantasy factory
I need less ballast
I watch your magic, your transformation - fabric, rope, gas
In this void, I dreamt, leapt and hoped
You fill this void
Ideas
Matter
Future
The weight of a rug, the weight of biscuits
A map of the world

Excerpt from *Airship Dreams: Escaping Gravity*, 2021.
Mike Stubbs in collaboration with Roland Denning,
Roger Illingworth, Dave Lynch, Rob Strachan and
Sam Wiehl. Words by Mike Stubbs 2021.

Dedicated to Den Burchmore

Notes to the reader

“The owl of Minerva spreads its wings only with the falling of the dusk.” Hegel

Airship Dreams began as an artistic enquiry into the aviation and innovation history surrounding Bedford’s iconic Cardington Sheds. In the 1920s, science and engineering came together in a period of full confidence in aviation and it seemed likely that Bedford, as the centre of Britain’s national airship network, would become the Heathrow of its time. However, that dream ended abruptly in 1930 with the crash of the R.101 airship. The Imperial Airship Scheme closed and its airships sold for scrap.

The tale of the Imperial Airship Scheme and the R.101 is not unlike that of the Titanic; a great innovative endeavour that ended in tragedy. Both of these seem apt metaphors for a society where class and Empire took precedence over proper planning, testing and regard for the ordinary man and woman.

What first intrigued us was a ghost that seems to have existed in Bedford ever since. An unspoken presence, the Cardington Sheds loom large on the horizon but the memories and stories

seem ever more elusive and nostalgic. Yet the appearance of the new Airlander hybrid aircraft in 2016 had captured people’s imaginations. Perhaps the airship wasn’t so elusory after all?

The initial premise of the artistic enquiry was to fuse together the memories and dreams of a ‘better, modern world’ as a reflection on our own changing times, as technology takes another vast leap, into AI, robotics and other society-changing technologies. However, as the artistic enquiry progressed, it became increasingly important to us to dig deeper and understand the wider political context, the acts of hubris and the ultimate impact on the local community.

This publication forms a trace of that deeper questioning. The series of essays can be read in any order and deal with both the history and the making of the artwork, in response. Our aim in creating this publication, is to use the past to invite reflection today, on our sense of place, belonging and ownership of our society and its direction.

Annie Bacon and Mike Stubbs



THE R.101

ONE OF THE LARGEST
AIRCRAFT EVER FLOWN
237M / 777FT LONG
GAS CAPACITY OF
1.5 MILLION METRES OR
5 MILLION CUBIC FEET
3.6 TIMES THE LENGTH
OF AN A380

PART ONE HISTORIES

The R.101

A Short History

1916	<ul style="list-style-type: none"> Short Brothers arrive in Cardington, Bedford and construct Cardington Shed 1 to build two rigid airships for the Admiralty.
1918	<ul style="list-style-type: none"> R.31 is built in Shed 1, followed by the R.32.
1919	<ul style="list-style-type: none"> The Great Depression takes hold and the Short Brothers leave Cardington.
1921	<ul style="list-style-type: none"> The airship station at Cardington closes.
1924	<ul style="list-style-type: none"> The Treaty of Versailles prevents Germany from continuing its airship programme. Air Minister, Lord Thomson launches the Imperial Airship Scheme with an innovation competition.¹ Vickers wins the R.100 private industry commission. Led by Barnes Wallis and assisted by Nevil Shute Norway. The Royal Airship Works at Cardington wins the R.101 state-funded commission. They use cutting-edge techniques, extensive research and experimentation.
1926	<ul style="list-style-type: none"> Restrictions on German airships lifted. Work resumes on its Graf Zeppelin.
1928	<ul style="list-style-type: none"> Germany's LZ 127 makes its first intercontinental trip, to New Jersey, USA. Hugo Eckener in command.
1929	<ul style="list-style-type: none"> The R.101 completes its maiden flight over London's landmarks. Lord Thomson returns to office as Secretary of State for Air. Favoured as the next Viceroy of India, he is almost obsessive over the R.101.²
August 1930	<ul style="list-style-type: none"> R.100 completes a successful transatlantic return flight to Canada.
2 October 1930	<ul style="list-style-type: none"> R.101 completes its test flight. Lord Thomson requests the R.101 leave for Karachi earlier than planned to meet his own political agenda.
3 October 1930	<ul style="list-style-type: none"> The R.101 Captain is concerned and insists on a 24-hour delay for his crew to prepare and rest.
4 October 1930 6:24pm	<ul style="list-style-type: none"> R.101 sets sail from Cardington, bound for Karachi.³ On board: fifty-four men including senior aviation and government officials; heavy cabin trunks; suitcases; two cases of champagne and a luxurious carpet.
8:00pm	<ul style="list-style-type: none"> The R.101 is observed flying over London.
11:36pm	<ul style="list-style-type: none"> The airship reaches the French coast at Pointe de St Quentin.
5 October 1930 00:18am	<ul style="list-style-type: none"> <i>"To Cardington from R101. 2400GMT 15 miles SW of Abbeville speed 33 knots. Wind 243 degrees [West South West] 35 miles per hour. Altimeter height 1,500 feet. Air temperature 51 degrees Fahrenheit. Weather - intermittent rain. Cloud nimbus at 500 feet. After an excellent supper our distinguished passengers smoked a final cigar and having sighted this French coast have now gone to bed to rest after the excitement of their leave-taking. All essential services are functioning satisfactorily. Crew have settled down to watch-keeping routine."</i>⁴
01:51am	<ul style="list-style-type: none"> The R.101's last signal. About 1km north of Beauvais, northern France. Local witnesses report a violent squall.
02:09am	<ul style="list-style-type: none"> The ship drops height and makes gentle impact with the ground just east of Beauvais. On impact all survive. A fire breaks out and envelops the ship. Eight men escape the wreck. Forty-eight men, including Lord Thomson, die. Six survive.
9 October 1930	<ul style="list-style-type: none"> The forty-eight coffins are shipped across the channel on HMS Tempest.

¹ G B Gratton *Flight Testing The Titanic: Re-visiting the loss of His Majesty's Airship R.101* Journal of Aeronautical History 2015 (paper 2015/05, pp 274-287).

² P Davison *The R.101 story: a review based on primary source material and first hand accounts* Journal of Aeronautical History 2015 (paper 2015/02, p 49).

³ Airship Heritage *Trust R.101 Trust* G-FAAW2020.

⁴ P Davison *The R.101 story: a review based on primary source material and first hand accounts* Journal of Aeronautical History 2015 (paper 2015/02, pp 43-120).

Imperial Monstrosities

Martin Mahony

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- 10 October 1930**
- The victims lay-in-state at Westminster Hall, London.
 - The mourning public wait for many hours to pay their respects.
-
- 11 October 1930**
- Memorial Services at St Paul's Cathedral and Westminster Cathedral in London. The coffins are transported by train from Euston to Bedford.
 - The forty-eight coffins are walked from Bedford to Cardington.
 - Hundreds of people line the two-mile route.
 - The men are laid to rest in a special mass grave.
 - A final, small service takes place with distinguished guests, including Hugo Eckener and Hans Von Schiller.
 - A RAF flypast in honour of the victims.
-
- 22 October 1930**
- Sir John Simon is appointed to hold an official enquiry in the accident.
-
- 27 March 1931**
- The report of the R.101 enquiry is published as Command Paper 3825 (Simon, 1931).⁵
-
- Later in 1931**
- A memorial tomb is completed and inscribed with the names of the victims.
 - The R.100 is decommissioned.
 - The R.100 and the R.101 wreckage are sold for scrap.
 - The Zeppelin company purchase 5,000kgs of duraluminium from the R.101 wreckage.
 - The Imperial Airship Scheme is abandoned, along with the plans for future airships and international routes to Singapore, Australia and Montreal.
-
- 5 October 2020**
- The 90th anniversary of the R.101 crash.

After 'the Kaiser's Monster Carnival'

Louis Blériot's first powered aeroplane flight across the English Channel in 1909 was a momentous achievement technologically. But it also confirmed a set of fears that had long been circulating in British political debate. This new aerial mobility appeared to render Britain's island isolation obsolete as a source of geopolitical strength, an observation which drove H.G. Wells' paranoid delirium about "the end of a historical cycle marked by British hegemony on a global scale".⁶ The air as a new highway appeared to render obsolete all previous presumptions about the relationship between geography and political power. No longer were control of land and sea the determinants of global hegemony. Sovereign territory could easily be breached from above, and any aggressive country with a well-equipped aerial force could subdue an enemy in a matter of hours.

In 1908 Wells foresaw terrifying fleets of Zeppelins in the sky, like "a herd of grey monsters at their feed".⁷ Perhaps informed by such literary depictions, and by knowledge of German military expansion,⁸ members of the British public between 1909 and 1913 reported seeing monstrously large airships hovering over Britain's coastal towns, creating a paranoia of being watched and perhaps of being subject to new forms of dastardly violence. Conservative thinkers and organisations used the scares to argue for a massive expansion in investment in aerial defence, although the assumption that Zeppelin raids would target military arsenals and dockyards — where most of the sightings were reported — proved to be wrong, as the first raids of the Great War targeted (not always accurately) Britain's large population centres. This transformation in warfare — the targeting of civilians and their urban environment — caused public outrage. The aerial invasions by the "baby killers" were used as a direct recruitment tool for the war effort, which by 1915 was focused on the total enrolment of the nation into the conduct of war.

5 P Davison The R.101 story: a review based on primary source material and first hand accounts *Journal of Aeronautical History* 2015 (paper 2015/02, pp9113-114).

6 Thomas Hippler, *Governing from the skies: a global history of aerial bombing*. London: Verso, 2017, p. 3.

7 H.G Wells, *The Works of H.G. Wells Vol. XX: The War in the Air and Other War Forebodings*, New York: Charles Scribner's Sons, 1926, p. 90.

8 See the essay by Jürgen Bleibler, this volume.

The first issue of *The Cartoon* in February of that year featured a visual depiction of 'The Kaiser's Monster Carnival of Terrorism' by renowned illustrator Harry Furniss. A dragon-like Kaiser, artillery firing from his fanged mouth, clutches at France and Belgium while Britannia cowers. Over his shoulder flies Count Zeppelin, metamorphosed into one of his famous craft, his vampiric claws dropping balls of fire on the innocents below. This was typical of the propaganda of the time: literally demonising the personifications of the German state, while depicting their military strategy as monstrous both in the sense of departing from the accepted moral codes of warfare, and as being waged by giant, terrifying new killing machines.

The terror of the Zeppelins may have subsided a bit by the end of the war. Ariela Freedman uses the diaries and letters of the likes of Virginia Woolf and D.H. Lawrence to show how the threat went from being a terrifying (if also rather exciting) novelty to being an increasingly banal and really quite irritating part of urban life on the home front, with the relative ineffectiveness of 'the Zepps' and their vulnerability to new modes of attack tarnishing their sublime aura of other-worldly invincibility.⁹ Nonetheless, the historians Duggan and Meyer argue that "memories of the emotionally disturbing wartime Zeppelin raids never fully left the public psyche", and thus any would-be British airshippers faced a difficult task to convince a sceptical government, military and public about the potential of dirigibles in the wider post-war task of peaceably remaking and repurposing the empire.¹⁰

Remaking the world

Technological innovation has long been central to changing forms of world order. But it's not as simple as new technologies giving rise to new forms of power in the world. For sure, in the age of European colonialism, technological innovation in the realms of transport and communication enabled imperial powers to consolidate their grip on distant and increasingly expansive colonial territories. Technologies like telegraphy, railways and the steamship were central to the exercise of imperial power. Yet they were also central to transformations

⁹ Ariela Freedman, 2004, 'Zeppelin Fictions and the British Home Front', *Journal of Modern Literature* 27(3): 47-62. See also the essay by Jürgen Bleibler, this volume.

¹⁰ John Duggan and Henry Cord Meyer, 2001, *Airships in international affairs, 1890-1940*, Basingstoke: Palgrave Macmillan, p. 6.



The Kaiser's Monster Carnival, originally published in *The Cartoon*, February 1915. Reproduced from the Hoover Institution Library & Archives, Poster collection, Poster UK 1527.

in the imagination of what *kinds* of imperialism, politics and power were possible. As the political historian Duncan Bell argues, telecommunications technologies enabled a particular kind of response in British imperial thought to observations of worldwide political turbulence at the end of the nineteenth century, driving "the cognitive shift that was necessary for people to conceive of the scattered elements of the colonial empire as a coherent and unified political unit, and even as a state".¹¹

While thinkers such as Edmund Burke contended that geographical distance and physical barriers - primarily the oceans - were unassailable obstacles to any kind of formal political union within the British Empire, others adopted a more optimistic outlook on technology, arguing that with the right kit, a kind of British world-state may not be far off. Often these arguments featured a rhetoric of conquering the elements - Thomas Carlyle proclaimed back in 1829 that "We can remove mountains, and make seas our smooth highway; nothing can

¹¹ Duncan Bell, 2007, *The idea of greater Britain: empire and the future of world order, 1860-1900*. Princeton University Press, p. 2.

resist us. We war with rude Nature; and, by our resistless engines, come off always victorious, and loaded with spoils".¹² Almost a century later, the atmosphere was becoming a new target of such conquest.

By the early 1920s the larger Dominions – such as Australia and South Africa – increasingly sought a more independent status in the world, and many feared the disintegration of the Empire. Debate raged about whether Britain should embrace a free trade policy or give preferential trade tariffs to the colonies and Dominions. The latter policy was seen as a chief way by which Britain could maintain its 'Great Power' status in the face of ascendants like the US. The imperial future was up for grabs again, and for the enterprising naval engineer and Conservative MP Charles Dennistoun Burney, the future lay in the air.

By this time the idea of a globe-spanning British world-state had largely receded into history, but airship travel appeared poised to transform imperial fortunes. Reprising themes from nineteenth century debates about technology and the empire, Burney argued that "By means of air travel and air travel alone can the British Empire conquer her great enemies – Time and Space".¹³ And with the distances involved in the British Empire, it was only airships which could be the agents of this conquest. Burney saw airships ushering in what he called a "British cosmopolis", the dirigibles contributing to defence, and easing trade and business connections. More importantly, airships would rouse an "Imperial consciousness", helping the Empire, as a "spiritual organism", achieve the kind of devotion from its far-flung citizens as the Roman Empire had seemingly enjoyed.¹⁴ Burney speculated that air travel would eventually usher in a new era of international cooperation under the auspices of some kind of world government. This would be bigger than the Empire, but by stealing a march on its rivals, Britain could ensure that any future world state would be built on British foundations.

By 1924 Burney had managed to convince enough of his fellow 'progressive imperialists' that the new Labour government backed a scheme to develop two new airships. One would be built by Vickers at Howden in Yorkshire, while the other would

be built directly by the Air Ministry at Cardington. The two new ships, R.100 and R.101 respectively, were spectacularly big compared to both their British and German predecessors. For their designers, this was a point of pride – old and new engineering was being scaled up to previously unimaginable magnitudes, to create ships fit for the world's biggest empire, ready to carry dozens of passengers in the utmost luxury. With much prompting by Air Ministry press releases, the ships were regularly talked about in the media in glowing terms, as marvels of British engineering and craftsmanship. The phrase 'monster airship', once used in headlines reporting the terrors of wartime Zeppelin attacks, now appeared regularly in the national and regional press to boast the magnitude of these engineering achievements.

Others were more sceptical of this ballooning of airship proportions. For the Air Ministry's chief critic, naval architect Edward F. Spanner, the size and shape of the new craft could only mean structural and aerodynamic instability.¹⁵ The massive areas which the outer fabric would have to cover made the whole thing liable to damage, with potentially fatal consequences. Furthermore, German designers had insisted on relatively narrow, more sausage-like shapes; their British counterparts had moved to a fatter profile after experiments in wind tunnels with scale models. This was a decision which critics like Spanner feared could only create problems for flight in choppy weather.

When R.100 nonetheless made it across the Atlantic to Canada in 1929 it was greeted with great enthusiasm by the public of Montreal. Three hundred thousand came to see the ship at the newly erected mooring mast. However, the airship was decried as "the monster" in the French-Canadian press.¹⁶ Here, its size, as well as the pomp and ceremony which greeted its visit, was taken as symbolic of Britain's continued imperial hold over Canada, and its suppression of other claims to sovereignty, like those of the Québécois. The French-Canadian press arguably had it quite right – this was a technology which was openly designed to knit together the 'Anglosphere' into closer union, and to secure British hegemony in a world where geopolitical plates were shifting fast.

12 Thomas Carlyle, 1829, 'Signs of the Times', *Edinburgh Review* 49, p.442.

13 C.D. Burney, 1929, *The world, the air and the future*, London: A.A. Knopf, p. 22.

14 Burney, *The world, the air and the future*, pp. 40-44.

15 See for example E.F. Spanner, *This Airship Business* (Williams and Norgate, 1927) and *Gentlemen Prefer Aeroplanes!* (E.F. Spanner, 1928).

16 Quoted in Duggan & Meyer, *Airships in international affairs*, p. 169.

Monstrous hybrids

But there's another sense in which these ships were 'monstrous'. The term 'monster' has Latin origins, and for the Ancient Greeks and Romans a monster was an entity that was "contrary to the usual course of nature",¹⁷ for example by transcending the conventional boundaries between the human and the nonhuman. This is a meaning of 'monster' which has stayed with us – think for example of Bram Stoker's *Dracula* or of Frankenstein's monster, both of which reside in an uncertain and thus terrifying space between and beyond the 'human' and the 'natural', and in the latter case, between the organic and the mechanical.

Like Frankenstein's monster, interwar airships were odd hybrids of the mechanical and the organic. In metaphorical terms they were frequently compared to whales or great 'silver fish', floating as if suspended in the ocean.¹⁸ R.101's automatic gas valve system was praised in the press as an "ingenious adaptation" of fish gills, which allowed the hull to breathe.¹⁹ While R.100 has been viewed retrospectively as the more 'elegant' design, simple and efficient, and not relying too heavily on new and untried technologies, R.101 was 'bristling' with new bits of kit, a monstrous assembly of innovations and experiments. For some commentators, this loading of the vessel with the relatively untried and the untested would be its ultimate downfall.²⁰

Many of these new technologies were geared towards the maintenance of consistent buoyancy as the airship travelled through different atmospheric conditions. An airship achieves lift by becoming, in a sense, a part of the atmosphere – by enveloping a quantity of gas and then, by regulating the temperature and pressure of that gas in relation to the air outside, entering into a relationship of balanced equilibrium. An airship stays afloat in changing conditions by actively changing the material constitution of itself – venting gas, dropping ballast, and even by seeking or avoiding warm sunshine. While aeroplanes have been increasingly sealed off

from the atmosphere through which they travel, an airship can only work by working *with* the atmosphere. Much like a balloon, as the theorist Derek McCormack describes them, an airship's envelopment of gas sets it apart from the atmosphere, but rather like a cloud, it is never entirely discontinuous with the atmosphere.²¹ It is both of and apart from the sky, maintaining flight by adjusting itself – automatically or through the actions of its pilot – to changes in the weather around it. An airship is a monstrous hybrid of technology and environment, inside and outside; a hybridity which was rendered by some contemporary critics into a language of fragility and vulnerability. If an airship was so dependent on a medium about which so relatively little was known, how could it hope to voyage safely? An airship was vulnerable to the atmosphere's violent forces in a way which aeroplanes were not, and the record of airships crashing in bad weather would appear to bear out some of these fears.

For airship proponents, this relationship with the atmosphere could be turned to an advantage. The craft could take advantage of predictable wind patterns, and thus reinvigorate the old sailing routes which, until the coming of the steamships, had undergirded Britain's imperial might. The guiding idea for Maurice Giblett, head of airship meteorology at Cardington, was that "the atmosphere should be used to work for the airship and not be its master".²² This extended beyond finding tailwinds to, for example, using clouds to shelter from the sun and regulate the temperature of the lifting gas, and collecting rainwater during storms to replenish the ballast tanks. The atmosphere itself, with its thermal energy, its winds and its water, was to be made a key part of the infrastructure of flight.

While some exchange with the atmosphere was necessary to achieve steady flight, what one didn't want of course was for the hydrogen gas, the main lifting agent, to escape. In both ships the giant internal gas bags were made of goldbeater's skin, a material manufactured from the intestines of oxen and cows, and paired with cotton for strength.²³ Countless separate skins

17 J.E. Riddle, *A Complete English-Latin and Latin-English Dictionary*, London: Longmans, Green, and Co., 1870, p. 399.

18 For example, "The airship resembled nothing so much as a huge double-tailed whale inflated and floating placidly in the air. There was scarcely a movement. The airship was steadiness itself", 'Maiden Flight of R101' *Gloucestershire Citizen*, 14 October 1929.

19 'The State Airship', *The Times*, 27 July 1928. Katherine Mansfield likewise described a wartime Zeppelin over Paris as the "Ultimate Fish". See Freedman, 2004, p. 53.

20 For example E.F. Spanner, *About Airships*, London: E.F. Spanner, 1929.

21 Derek McCormack, *Atmospheric Things*, Duke University Press, 2018.

22 Enid R. Holmes, *Airship Meteorologist*, 2008, p. 63. Manuscript available at the National Meteorological Library and Archive, Exeter, and recently published as *Line Squall* by the Airship Heritage Trust.

23 See Mark Steadman, 'The Goldbeater, the Cow and the Airship', Denmark Post & Tele Museum, 2006. Available at http://www.ptt-museum.dk/en/online_magazine/previous_articles/broadcasting/?id=74

sourced from, it's thought, millions of cattle slaughtered by the meat industries of North and South America, were pieced together to create the cylindrical bags which filled the great majority of the ships' bulk. Prized for its impermeability, (the membranes were in a sense still 'alive', with enzymes helping with the creation of sealed seams), goldbeater's skin had earlier made appearances in oboe reeds and condoms. It has also been used in hygrometers, where its sensitivity to changes in humidity is prized. However, this sensitivity also posed problems when ships would be flying through variably moist and dry air, and the different responses of the skin and the cotton to drying-out could lead to the whole structure becoming dangerously misshapen and distorted. This was a particular worry for journeys into tropical atmospheres – different versions of the gas bag fabric were left out in the Egyptian sun to figure out the best way to assemble a gas bag which would stand up to a tropical climate.

Some involved in the design of the ships worried about the 'natural imperfections' of an animal substance like ox intestine, and about the impossibility – given the quantities involved – of checking for consistency. Patents were filed for artificial silk replacements, but these weren't developed in time for the first flights of Britain's imperial airships, which took to the air with their ox guts and fish gills, 'leviathans of the air' seeking alliance with the atmosphere to generate new highways of imperial intercourse.²⁴

A monstrous 'gamble in the dark'

In reading the critics of the airship scheme, there is one final, more moralistic version of monstrosity at play – the apparent inattention of designers, or perhaps more accurately their paymasters, to adequate safety testing of these new technological assemblages, and the underestimation of the risks being taken by passengers of the first flights. Spanner explained that he had, for example "a very poor opinion of goldbeater's skin-lined fabric as a container for 'passengers' lives'".²⁵ By 1929 even Burney himself was trying to manage expectations by publicly explaining the drawbacks of the two ships' design and construction: "it cannot be pretended", he wrote of the gasbags, "that they present a really satisfactory solution to the problem".²⁶

²⁴ 'Civil Aviation', *The Queenslander*, Brisbane, 9 January 1927.

²⁵ Spanner, *About Airships*, p. 135.

²⁶ Burney, *The world, the air and the future*, p. 255.

By that time the completed R.101 had been found to have insufficient lift, so it was cut in half and an extra bay inserted, giving an estimated 9 tonnes of extra lift. The gas bags were allowed to expand further, necessitating improvised padding of the frame to minimise the risk of chafing and puncturing.

Those who have studied the airship scheme largely agree that these improvised, experimental changes to R.101 were motivated by political considerations. Lord Thomson, who was back in charge at the Air Ministry from June 1929, wanted to fly on the airship to India and back. It is thought that he was keen on being the next Viceroy of India, and when it came to the timing of R.101's maiden transcontinental voyage in October 1930, Thomson couldn't resist the spectacle of an airborne return to London from Karachi in time for the Imperial Conference, where the future of imperial airshipping was to be sealed.

For the most vociferous critics of the airship scheme, the crash of R.101 in the early hours of 5th October was not just a tragic accident, but represented a monstrous disregard for risk, and for human life. For those on the right of the political spectrum, the airship scheme represented an unwelcome intrusion of the state into the process of technical innovation, meaning that political ambition had overridden commercial and technological common sense. For those to the left of Ramsay MacDonald's government, the airships represented the "criminal eagerness" with which a supposedly socialist Labour Party had pursued "the policy of British imperialism, 'the linking of the Empire'", and its desperate search for a very public "demonstration of courage and Imperial achievement". For T.H. Winttingham, writing in *Labour Monthly*, "the disaster seemed to almost all outside Britain, and to many in Britain, a clear sign of the decay that is corroding the imperial power of Britain, a clear omen of the disaster to which is doomed British imperial policy – now becoming equally a gamble in the dark against head winds."²⁷

'Hopeful monstrosities'

The official inquiry into the crash carefully skirted around questions of individual or even political blame. Nonetheless, it referred to the feverish atmosphere at Cardington which was created by the pressure to get to India one way or another, and

²⁷ T.H. Winttingham, 'The Crime of R.101', *Labour Monthly*, December 1930.

to ensure that the years of work in the sheds wouldn't be wasted. The Ministry's Director of Airship Development R.B. Colmore reportedly remarked to a friend that "If the ship doesn't get back in time for the Imperial Conference, I understand that not only will there be no money for future airship work, it just won't be asked for".²⁸ The whole future of the British airship industry seemed to hinge not just on R.101, but on one particular flight. The official inquiry likewise concluded, somewhat diplomatically, "that the R.101 would not have started for India on the evening of October 4th if it had not been that matters of public policy were considered as making it highly desirable that she should do so".²⁹

Expectations about technologies can be powerful things. Having spent years making promises and building widely shared expectations about an imperial future re-made by airships, the Air Ministry had a hard time admitting that maybe things weren't going to be as easy as imagined, or perhaps that more time was required to get things right. The power of technological expectations is perhaps best illustrated when repeated failures and disasters fail to fully unseat the hopes that get attached to individual technologies. Scholars who research the social processes behind technological innovation have used the idea of 'hopeful monstrosities', taken originally from Joel Mokyr's book *The Lever of Riches*, to describe such technologies.³⁰ Hopeful monstrosities are those which can potentially fulfil some social function – such as long-distance, comfortable travel – but which nonetheless continually come up sort somehow. Yet despite their shortcomings, these technologies continue to exercise a powerful hold over shared imaginations of the technological future.

So it is with airships. Despite numerous disasters, mishaps and near misses during the 1920s and '30s, they continued to exercise a powerful hold over those who wanted to re-make the world with new technologies of mobility. This includes those involved in building the R.101 itself; those who privately may have expressed misgivings about the craft, but "who believed wholeheartedly in the policy", and whose "hopes" – for their inventions, their careers, their country – were inextricably bound

28 Quoted in James Leasor, *The Millionth Chance*, Hamish Hamilton, 1957/2015, np.

29 Report of the R-101 Inquiry, London: HMSO, 1931, p. 96.

30 For example, Frank Geels and Wim Smit, 2000, 'Failed technology futures: Pitfalls and lessons from a historical survey', *Futures* 32, 9: 867-885.

up with R.101's success.³¹ And airships retain something of that hopeful hold to this day. In the retro-futurism of steampunk art and literature, the never-quite-realised future of airship travel is transformed into a form of alternative or counterfactual history, where the airship reminds us that the world could have been, and could still be, very different. In Michael Moorcock's anti-imperial 1971 novel *Warlord of the Air*, airships help maintain a dastardly imperial power. In other renderings, airships' improvised combinations of high and low technology mean they lend themselves to being the craft of choice of the plucky outsider – rebels and pirates waging airborne guerrilla warfare against oppressive regimes. Across genres, an airship is a sure literary signifier that here is a world much like ours, but different in some crucial ways.

Back in the here-and-now, airships are of increasing interest to military powers who value their capacity to stay in the air for long periods of time, surveying the activities of those below.³² Airships have floated into view above the contested horizons of Brexit, with one thinktank boldly proposing their use as a non-obtrusive form of border control on the island of Ireland.³³ Others foresee a rebooted role for them in luxury global travel, as 'superyachts' of the sky.³⁴ For Google co-founder Sergey Brin, airships are the future of providing humanitarian assistance to the hard-to-reach.³⁵ Brin emphasises the low-carbon credentials of airships, and others, such as former UK Chief Scientific Advisor and climate envoy Sir David King, have proffered them as the climate-friendly future of global freight and, perhaps, passenger transport.³⁶ Running on renewable energy, airships wouldn't mess with the atmosphere in the way that CO₂-belching jet aeroplanes do; Maurice Giblett's vision of a partnership between airship and atmosphere, technology and environment here takes on a new aspect – one by which we might float more serenely across the face of the globe, while

31 Report of the R-101 Inquiry, London: HMSO, 1931, p. 95.

32 Kyle Mizokami, 'China's new spy airship hunts aircraft carriers from the edge of space', *Popular Mechanics*, 21 October 2015.

33 John Campbell, 'Brexit: Airships could patrol Irish border, says thinktank', BBC News Online, 11 September 2017.

34 Henry Mance, 'Boarding soon: the five-star airship bound for the North Pole', *Financial Times*, 11 October 2019.

35 Brin has founded Lighter Than Air (LTA), a research and development company currently building prototype craft in California. See www.lta-research.com

36 See also the essay by Felix Banzhaf, this volume. Bedford-based Hybrid Air Vehicles have recently proffered airships as an environmentally-friendly alternative for short-haul passenger aviation.

respecting the limited capacity of environmental systems to absorb our waste.

When geopolitical plates are shifting; when the place of a nation in the world is undergoing contentious reconsideration; when people are trying to imagine a different future for themselves, or even a different past, airships float into view. Both the artistic and social history aspects of the *Airship Dreams* project have captured perfectly how these hopeful monstrosities remain with us as sources of local and national pride, of regret at futures un-realised, and of hope that we might yet succeed in collectively making the world otherwise. My intention in this essay of exploring airships in general, and R.101 in particular, as 'monsters' has not been to denigrate them, nor to argue for their relegation from the 'real world' to the world of dreams and misplaced fantasies. Rather, as the philosopher of science and technology Bruno Latour argues, we need to learn to "love our monsters". For Latour, the moral message of *Frankenstein* was not that the titular doctor sinned by tinkering, experimenting, and transgressing the borders of 'nature'; rather, Doctor Frankenstein's sin was to banish his monstrous creation, to run away from it when what he needed to do was go back to it, to tinker some more, to care some more. We need to love our monstrous technologies like our children, Latour contends.³⁷ To take responsibility both for their successes and their failures, to recognise their potential to make the world both worse and better, and to carefully steward them towards the latter. No technology is inherently good or bad, useless or useful. Buoyed by hopes, expectations and pride passed down over a century, airships may be poised to monster the skies once more. It's up to us what kind of monsters they become.

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³⁷ Bruno Latour, 'Love your monsters', *The Breakthrough Journal* 2, Fall 2011.

Arms Race

Arms Race and Competition for Civilian Markets Rigid Airship Construction in Germany and Great Britain, 1908 to 1930

Jürgen Bleibler

Between 1900 and 1938, four nations built rigid airships. Germany led the way with 139, followed by Great Britain with 17, the USA with three, and France with only one. The German airships comprised 119 Zeppelins and 20 models produced by the Luftschiffbau Schütte-Lanz, until 1918, the only rival of the market leader on Lake Constance. However, the Zeppelins not only dominated in numbers. To this day, Count Zeppelin as the legendary figure of the German Empire, Hugo Eckener as the pioneer of airship travel in the 1930s, and the crash of the "Hindenburg" in Lakehurst on 6 May 1937 eclipse the airship activities of other countries. Spanning from the German Empire to the Weimar Republic to National Socialism, the Zeppelin era is not only an integral part of German history, but also impacted international relations. Great Britain pursued the rigid airship idea from 1908 to 1930, as in Germany, first for military, then for civilian purposes. Above all, the recurring interrelations between the two nations' rigid airships manifest a story of rivalry and competition.

The War of the Future and the Third Dimension

From the early 20th century onwards, the major powers competed for economic growth, scientific and technological progress, and colonial expansion. At the same time, airships and airplanes became new military options. Initially envisaged for reconnaissance, airships and the possibilities provided by their payloads and ranges soon gave rise to the idea of bombing. A ban imposed at the Hague Peace Conference of 1899 was rescinded in 1907 because none of the airship nations wanted to forgo a military advantage. In the resulting arms race, the German Empire invested most of its faith in the Zeppelins. While their performance was often outstanding, the airships also suffered severe setbacks which exposed the discrepancy between power phantasies and technological realities.

In the 1890s, Germany emerged on the international scene as a colonial power and challenged the British Empire with its naval armament. The ensuing rivalry with Great Britain became a

fixation in German society, which Count Zeppelin also supported. In view of the financially ruinous and ultimately futile arms race against the Royal Navy, the novel “Zeppelin Weapons System” and the threat to the British Isles from above promised a new trump card.

The British watched this development closely: In 1905, their consul in Stuttgart called attention to the airship activities on Lake Constance, and in April 1908, an army officer warned about this new strategic threat in a report.³⁸ It was, however, an exceptional Zeppelin flight that sparked British rigid airship construction. On 1 July 1908, LZ 4 covered the distance from Lake Constance to Lucerne in Switzerland in a record-breaking twelve hours. While the unannounced aerial intrusion even inspired positive comments among Switzerland’s official representatives, it caused alarm in Great Britain. The British press pondered the benefit of ruling the seas in the face of a future war in the skies, and alleged Zeppelins were promptly sighted over England.³⁹ Although these reports were no more than rumours, Great Britain reacted by passing a law on the closure of its own airspace in 1911.⁴⁰

The First British Rigid Airship

The Royal Navy’s technological response was a rigid airship that served as an aerial scout over the sea. The British never considered airships as offensive bomb carriers since they preferred to deploy airplanes for this purpose. The commission went to the shipbuilding and armaments corporation Vickers, who were eager to gain a monopoly in this new market. The project was contested among politicians and military experts and many regarded rigid airships as a waste of money. However, Rear-Admiral Bacon, one of the initiators, argued that aerial reconnaissance was indispensable for a fleet, especially if the enemy was equipped in this way.

As it was almost impossible to obtain information on the German Zeppelins, British specialists tried to integrate the

experiences gleaned from submarine construction. This led to very innovative but insufficiently developed ideas that contributed to the failure.⁴¹ Like the first Zeppelins, H.M.A. No. 1 was built in a construction shed on water. The “Mayfly”, as the British press derisively called the airship, was initially too heavy. Alterations reduced the weight but also weakened the structure leading the first British rigid airship to break apart in September 1911 without ever having flown.⁴²

The Zeppelin as a National Symbol and Further British Attempts

On 4 August 1908, LZ 4 embarked on a 24-hour endurance flight under the command of seventy-year-old Count Zeppelin. Intended as a demonstration of performance and a threat against France, the flight was a complete technological failure. However, instead of sparking criticism, the destruction of the Zeppelin in Echtingen resulted in a “Volksspende (Donation of the People)”, which manifested the nationalistic identification with Count Zeppelin as the “Conqueror of the Skies”. The donation enabled the founding of the Zeppelin Group, a globally unparalleled aerial armament corporation before the First World War. It also turned the Zeppelin into a symbol of collective identification. Grand Admiral von Tirpitz, the leading figure of German naval armament, was one of the few critics and expressed serious doubts about the Zeppelins’ suitability for naval warfare. From 1909 onwards, the German Army acquired Zeppelins and the Deutsche Luftschiffahrts-Aktiengesellschaft (DELAG) offered scenic passenger flights. Despite some embarrassing setbacks, the German Navy decided to procure rigid airships in the summer of 1910, not least because of the British rivals’ activities.

As the performance of the German Zeppelins stabilised from 1911 onwards, some British politicians, officers, and aviation experts voted for a second attempt based on broader information after the “Mayfly” flop. For this purpose, Admiral Jellicoe, who was to become famous as the British Commander-in-Chief in the Battle of Jutland in 1916, took a flight with the DELAG airship LZ 10 “Schwaben” in the company of Naval Attaché Watson in 1911. In 1912, Rear-Admiral Sueter, commander of the Air Department of the Royal Navy, and the aviation expert O’Gorman boarded the LZ 13 “Viktoria Luise”

38 Higham, Robin: *The British Rigid Airship, 1908 - 1931. A Study in Weapons Policy*, London 1961, p. 36.

39 Haude, Rüdiger: Überwältigend. Zur politischen Bedeutung der Schweizfahrt des LZ 4 am 1. Juli 1909, in: *Wissenschaftliches Jahrbuch Band 11, Zeppelin Museum Friedrichshafen, Friedrichshafen 2014*, p. 10.

40 Otto, Dietrich W.: *Die Entwicklung und Regulierung der Luftfahrt in Hinsicht auf die Globalisierung 1783-1947*, Zurich, Basel, Geneva 2017, p. 47.

41 *Handbook of Rigid Airship No. 1, Parts I. & II & Appendix*, November 1913.

42 Higham, *British Rigid Airships*, p. 47 ff.

disguised as American tourists. All reports were positive. In 1912, the Germans also put their first naval Zeppelin L 1 into service, followed by L 2 in 1913. The Royal Navy went on to commission Vickers with No. 9, their second rigid airship. Fortunately for the British, the German Army Zeppelin Z IV had to make an emergency landing in France due to heavy fog. Despite the Germans' strong protests, Z IV was examined by French experts who shared their insights with the British. In the space of just a few weeks during the autumn of 1913, the German Navy lost both L 1 and L 2 due to accidents in which 42 people died, a turn of events that cast increasing doubt on rigid airships.

The First World War

Between 1914 and 1918, German rigid airships proved to be a great disappointment in military terms. Neither the attacks on the British Isles, during which airship bombs killed around 550 civilians, nor the patrols over the North Sea had any influence on the outcome of the war. In May 1915, a Zeppelin dropped the first bombs in the centre of London. However, the British air defence became increasingly efficient in dealing with this threat. By the same token, the bigger and faster Zeppelins employed to operate under extreme conditions in heights of 5,000 metres as so-called height climbers from 1917 onwards suffered such extreme losses through shoot-downs and accidents that their replacement with airplanes became a reality in the strategic aerial war in 1918. For the German fleet commanders, the psychological impact the Zeppelins had on the Royal Navy outweighed their actual advantage. The myth that the German fleet was only able to escape the superior British forces in the Battle of Jutland due to Zeppelin reconnaissance defined the USA's military airship programmes up until the 1920s.⁴³

Before it had even gotten started, rigid airship construction in Great Britain came to a standstill after the outbreak of the war. Due to technical problems and other priorities, it took until 27 November 1916 for No. 9 to take to the sky as the first British rigid airship after three years in the making. A construction programme launched in 1915 was equally sluggish and only managed to produce six of the originally envisioned eight airships by 1917/18.⁴⁴ The scarce material and manpower were needed for more important armaments such as airplanes.

The smaller blimps the Royal Navy deployed successfully against the German submarines were also rivals for resources. During the war, the British rigid airships were way behind their German contemporaries and played almost no part in military contexts. However, they were used to train crews and to improve mooring systems and gave other companies such as Armstrong-Whitworth or Beardmore a chance to enter the market besides Vickers. In 1917, Short in Cardington also started to develop two airships with timber skeletons inspired by the Zeppelin rival Schütte-Lanz.

The British airship builders gleaned the most important information about the technological status quo from the German Navy Zeppelin L 33, which had been forced to make an emergency landing near Little Wigborough in Essex in September 1916. R.33 and R.34 were built according to these new insights but only put into service after the war. The more complex structure posed new challenges and it took months just to convert the metric units. Further insights gained from other Zeppelins were included. In October 1917, the "Height Climber" L 49 made an emergency landing in France, and in August 1918, parts of the shot-down L 70 were salvaged from the North Sea. While L 49 led to alterations in the construction of R.36, the Royal Navy demanded that the R.38 class, which had been projected for 1918, should surpass the newest L 70 Zeppelins in size and performance. The construction of R.38 did not start until February 1919. Newly established and nationalised in the same year, the Royal Airship Works in Cardington were responsible for the airship.⁴⁵ However, even the prolonged war could not really justify these last developments. From 1917 onwards, the British had high-performance long-range flying boats at their disposal that not only enabled efficient reconnaissance but could also fight submarines and Zeppelins.

The 1920s: Demilitarisation and the Vision of Global Air Travel

For Germany, the war resulted in an overwhelming defeat, a revolution, and the end of the Empire. Despite its military failure, the Luftschiffbau Zeppelin GmbH had managed to extend the rigid airship's range to intercontinental dimensions of over 10,000 kilometres between 1914 and 1918. During the four years of war, 116 rigid airships were in service on the German side,

43 Higham, *British Rigid Airships*, p. 149 ff.

44 Brooks, Peter W.: *Zeppelin: Rigid Airships 1893-1940*, London 1992, p. 110 ff.

45 Robinson, Charles H., Keller Charles L.: "Up Ship!" A History of the U.S. Navy Rigid Airship 1919-1935, Annapolis, p. 29 ff.

both the technological efficiency and the experience acquired through these deployments were unparalleled. Their existence was now under threat because the remaining combat airships had to be handed over and some crews faced destruction. After the Treaty of Versailles entered into force, LZ 120 "Bodensee" and LZ 121 "Nordstern", small passenger airships used for air travel within Germany and Europe, were confiscated as compensations. The prohibitions laid down in the Peace Treaty initially excluded the German Zeppelins from the new race for air traffic across the oceans. In 1919, this was a welcome opportunity to convert military airship technology.

However, the fate of the rigid airship was also at stake in Great Britain. In 1919, the few surviving airships were mostly outmoded, and although some newer models were in the making, it was unclear whether they could be completed. The government had cut back on all arms expenditure and the Royal Navy's interest in rigid airships was at a low. They were thus passed on to the Royal Air Force, who were equally doubtful about their future.

With Pratt and Wallis, Vickers had a competent construction team and was still the leading British rigid airship builder. Making quick use of the advantages brought about by the changed conditions of peace, Vickers presented a detailed plan in 1919 that promised global airship travel for passengers, post, and freight as a faster addition to the shipping lines.⁴⁶ Mobility and communication in the British Empire, which was at the height of its expansion, would have profited considerably from this service, not to mention the time it would have saved. While a sea voyage from England to Australia took thirty-four days, it had been estimated that an airship could cover the distance in ten days with four stopovers. Of course, the most traffic was expected on the route from Great Britain to the USA. Besides industrialists and politicians, prominent and committed airshipmen such as Maitland, Masterman, Scott, Pritchard, and other advocates supported the initiative.

Especially from the perspective of these practitioners, a flight over the Atlantic was the best way to demonstrate the rigid airship's adequacy for intercontinental air traffic and to convince sceptics. Inspired by a relatively robust Zeppelin construction

from 1916, R.34 was chosen for this task and thus became the first airship to cross the Atlantic in July 1919. This was also the very first crossing from East to West and the first flight to America and back.⁴⁷ From 1919 onwards, Eckener became the leading figure in all things Zeppelin in Friedrichshafen. Before 1914, he had already worked for Count Zeppelin and the DELAG and had trained airship pilots for the Navy. In his memoirs, Eckener very unjustly described the Atlantic crossing of R.34 as "not very impressive"⁴⁸, a statement that reflects the frustration over the forced German inactivity even decades later.

The Atlantic crossing was followed by a severe setback, which was equally devastating for the British and the Americans. On 24 August 1921, R.38, the then biggest airship in the world, broke apart over Hull due to structural flaws resulting in the death of 44 members of the American-British crew. On the verge of being demolished, the British had sold the model to the US Navy who were especially interested in rigid airships for oceanic warfare. The catastrophe thwarted the transfer to the USA and had an impact on airship construction in Germany. For the US Navy, the event was a reason to capitalise on the former enemy's knowhow by commissioning the so-called reparations airship LZ 126. In October 1924, LZ 126 flew to the USA under the command of Eckener, thus putting the German Zeppelins on the transatlantic map. Unlike R.34, LZ 126 was a comfortable passenger airship, and Eckener used this flight to promote his ambition to establish global air travel.

R.100 and R.101: The First "Luxury Liners of the Sky"

The Vickers initiative of 1919 was quickly shelved. In 1922, however, it was revived as the so-called Burney Scheme by the eponymous aviation technician and politician who was closely affiliated with the company as a consultant. Seeing potential for sales opportunities, the mineral oil corporation Shell also participated in the endeavour. In 1923, indications in the British press pointed towards the possibility of a convergence between Vickers and the Luftschiffbau Zeppelin GmbH. Burney and Wallis did in fact travel to Friedrichshafen for exploratory negotiations about a technological and operational collaboration in May 1923. However, the plans never progressed

⁴⁷ Maitland, E. M.: The Log of H.M.A. R 34: Journey to America and back, London 1920.

⁴⁸ Eckener, Hugo: Im Zeppelin über Länder und Meere. Erlebnisse und Erinnerungen, Flensburg 1949, p. 207.

⁴⁶ Pratt, H. B.: Commercial Airships, London 1920.



Hugo Eckener and Hans von Schiller attending the funeral service for the R.101 victims 11 October 1930.
Image courtesy private collection of Jürgen Bleibler.

beyond the initial stage since the Zeppelin Group's decision makers with Eckener leading the way had already decided upon a partnership with the USA in the Joint Venture Goodyear-Zeppelin-Corporation.⁴⁹

In 1923, the Burney Scheme was approved by the Conservative government in London, only to be rejected by the newly elected Labour government a year later. After some toing and froing, the decision was finally made to have R.100 built by a private subsidiary of Vickers, the Airship Guarantee Company in Howden, and to commission the Royal Airship Works in Cardington with the construction of R.101.

The America Flight of LZ 126 had brought Eckener fame, which he used skilfully to build his popularity and reputation as an authority on all matters concerning airship travel. On the inside, he re-established the Zeppelin airship as a German symbol of

identification in the Weimar Republic and managed to reach opposing political movements. With permission to resume airship construction in 1926, Eckener initiated the Zeppelin Eckener Donation, a calculated effort to draw on the emotions the "Volksspende (Donation of the People)" of 1908 had generated.⁵⁰ This appeal did in fact raise enough money to cover the lion's share of the building costs for the LZ 127 "Graf Zeppelin". From 1928 onwards, Eckener used the airship to publicly demonstrate the Zeppelin's potential to cover long distances. The world tour in the summer of 1929 was especially spectacular. Despite all the headlines, the "Graf Zeppelin" with its 40 crew members and capacity for 20 passengers could not provide profitable travel by any stretch of the imagination. The airship was too small for a reliable service over the North Atlantic, and in the shadow of the Great Depression, any thoughts of building a more substantial Zeppelin had to be put on hold.

In the 1930s, the British were the first to go forward with the construction of large airships. R.100 and R.101 exceeded the volume of LZ 127 by more than 50,000 cubic metres and were also the first airships with expansive interior passenger decks. The story of these two airships and the competitive pressure they engendered between the builders, the political, economic, and technological decision makers, the crews, and those for or against airships or airplanes as well as the ongoing discussion about technological details could fill entire libraries. The simple facts are that R.100 flew across the Atlantic to Canada and back in the summer of 1930, and R.101 crashed and caught fire in the North of France on its way from Cardington to India on 5 October 1930. Of the 54 people on board, 48 died, including Aviation Minister Thomson. This tragedy marked the end of rigid airship construction in Great Britain.

But how did the German airship builders react to this event that drastically demonstrated the risks of airships filled with hydrogen gas, regardless of the exact cause of the disaster? Helium was known as an alternative, and an extremely limited amount was available in the USA, where it had become compulsory for airships in 1922. Since the US Navy's own rigid airship programme had precedence, neither the British nor the

⁴⁹ Higham, *British Rigid Airships*, p. 244.

⁵⁰ Duggan, John, Cord Meyer, Henry: *Airships in International Affairs 1890.1940*, Basingstoke 2002, p. 125 f.

Germans were able to obtain helium. The higher costs and decreased payloads would also have had an impact on the development.

On the evening of 25 April 1930, Eckener addressed the most important protagonists of British airship travel at a dinner that had been arranged in his honour by Aviation Minister Thomson. He believed that helium was necessary for broad commercial airship travel because only very experienced crews could guarantee absolute safety with hydrogen.⁵¹ Eckener had travelled from the USA to England via steamboat and took the LZ 127 "Graf Zeppelin", which had been on a visit to Cardington, back to Germany the next day. On this occasion, some German engineers were given the opportunity to inspect both British airships and to experience the relocation of R.100 from the mooring mast into the hangar from inside the control car. The visitors were especially interested due to the plans for a comparative airship in Friedrichshafen, the new LZ 128 with 155,000 cubic metres and passenger decks in the hull. Thus, the opportunity to become acquainted with the first representatives of this size category was more than welcome. After the R.101 catastrophe, the LZ 128 project was silently shelved in favour of plans for LZ 129, a new, even bigger airship with an altered lifting gas system. The hydrogen gas, which was supposed to make up 35% of the total amount of 200,000 cubic metres, was to be stored in spherical cells inside helium cells. However, this would not have eliminated the risks posed by hydrogen.⁵² Eckener's appearance at the memorial service for the victims of the R.101 crash increased his popularity among the British and he was heard at the inquiry commission. However, he did not have enough time to examine the extensive material in detail.⁵³

Despite some collegial connections with British airshipmen, Eckener continued to regard the British as rivals on a barely nascent market until the end of R.101. After the tragic ending of the British airship activities, the crash of ZRS 5 "Macon" also led the Americans to give up their military rigid airship programme in 1935. From 1931 onwards, "Graf Zeppelin" regularly flew to



LZ 127 and R.100 at the mooring mast, Cardington 26 April 1930.
© Archiv der Luftschiffbau Zeppelin GmbH.

Brazil, and in 1936 the new LZ 129 "Hindenburg" opened the route to the USA. This first truly efficient passenger airship was filled with 200,000 cubic metres of hydrogen gas. The world at large had all but forgotten about the crash of R.101, and German confidence in the handling of airships filled with hydrogen was restored. By 1936, Germany had reclaimed its pole position as the only airship-building nation in the world, an image that corresponded perfectly with the National Socialists' supremacy propaganda. Moreover, it would have been impossible to obtain helium from the USA prior to the crash of the "Hindenburg" on 6 May 1937, and Eckener's attempts to do so subsequently failed due to the aggressiveness of Germany under Hitler. Without helium, the future of Germany's passenger airship travel was also doomed.

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51 Masefield, Peter: To Ride the Storm. The Story of the Airship R 101, London 1982, p. 199.

52 Bleibler, Jürgen: LZ 129 Hindenburg – Entwicklungen und Bauverfahren im Starrluftschiffbau der 20er und 30er Jahre, in: Meighörner, Wolfgang, Zeppelin Museum Friedrichshafen (ed.): Zirkel, Zangen und Cellon – Arbeit am Luftschiff, Friedrichshafen 1999, p. 59 ff.

53 Spanner, E. F.: The Tragedy of "R 101", Vol. I, London 1931, p. 161 ff.

Technological Utopias

About the Utopian Quality of Sustainable Cargo Airships

Felix Banzhaf



The current form of the lighter-than-air technology airship is the cargo airship. For example, in the U.K., Bedford's *Hybrid Air Vehicles* promises both sustainability and maximum flexibility with the *Airlander 10*⁵⁴ and is not alone with this claim. An array of reports and articles circling in newspapers and especially on the internet herald the imminent comeback of different types of airships. Peter Lobner of the *Lyncean Group of San Diego* compiled an extensive list with over 120 projects he describes as "modern airships".⁵⁵ Despite its impressive length, this list is by no means complete since there are many more airship projects out there. Some concrete realisation attempts, such as the *Cargolifter CL 160*, have already failed, some remain conceptual, while others are still in the process of development, or have been built as demonstration models.

Airlander 10.

Airlander delivers direct to the point of need, faster than surface transport, enabling time-sensitive deliveries without incurring the cost, environmental impact, or transshipments of today's air freight options. With a powerful combination of payload and endurance, Airlander offers an entirely new option for remote logistics.⁵⁴ Creative Commons Airlander 10 by Philbomagshot is licensed under CC BY 2.0.

54 Hybrid Air Vehicles website, subpage about the logistics of Airlander 10: <https://www.hybridairvehicles.com/our-aircraft/airlander-10/logistics/>. (Accessed: 6 April 2021).

55 Hybrid Air Vehicles website <https://www.hybridairvehicles.com/our-aircraft/airlander-10/> (Accessed: 6 April 2021).

56 Lobner, Peter, Modern Airships – Part 1, 18 August 2019 (last update: 3 April 2021) <https://lynceans.org/all-posts/modern-airships-part-1/> (Accessed: 6 April 2021); Lobner, Peter, Modern Airships – Part 2, 17 August 2019 (<https://lynceans.org/all-posts/modern-airships-part-2/>) (Accessed: 6 April 2021); Lobner, Peter, Modern Airships – Part 3, 18 August 2019 (<https://lynceans.org/all-posts/modern-airships-part-3/>) (Accessed: 6 April 2021).

The Current Employment and Use of Airships

Airships are used as advertising vehicles, in passenger services that offer round trips, for scientific research, or for surveillance. However, the *Zeppelin NT* and some smaller blimps, such as the *WDL* airships, are the only manned airship systems the Luftfahrt Bundesamt (Federal Aviation Office) has certified for regular commercial passenger service.⁵⁷ To date, most airship projects have not progressed beyond the conceptual phase. Only a handful have been built as minimised experimental vehicles. As they commonly lack prototypes, most of the airship plans are not even ready to be approved.

Even in their current areas of use, airships are not uncontested. Depending on the purpose of the employment, they have strong and often more established competition from airplanes, drones, balloons, satellites, or helicopters. To achieve long-term economic success, airships would need to accomplish existing tasks with greater economic sustainability or find an unrivalled market niche. The claim to greater sustainability is mainly based on the physical calculation according to which airships gain buoyancy through their carrier gas and therefore only require energy for propulsion. However, they lose this advantage because of their size and limited speed. Re-employed airships in transatlantic traffic would mean adding cabins, beds, and extra



Zeppelin NT.
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Luftschiffbau
Zeppelin GmbH.

57 According to the Federal Aviation Office, the DZR is a certified aviation enterprise https://www.lba.de/SharedDocs/Downloads/DE/Formulare/B1/B11_Genehmigungen/Merkblaetter_Info/B1_LstLU.pdf?__blob=publicationFile&v=45 (Accessed: 13 April 2021), the EASA certifications for the WDL can be found at https://www.easa.europa.eu/sites/default/files/dfu/TCDS_EASA-AS-127_WDL_WDL_1-Series_i1.pdf (Accessed: 13 April 2021) and at https://www.easa.europa.eu/sites/default/files/dfu/EASA-TCDS-AS.001_Zeppelin_LZ_N07-100-03-23122009.pdf for the Zeppelin NT 07. (Accessed: 13 April 2021).

luggage due to the longer travel time. Any positive effects resulting from the more sustainable movement of airships would thus be cancelled out by the extra weight.

The Cargo Airship – A Market Niche?

Airship enthusiasts seem to have discovered heavy transports as a market niche in which airships would be unrivalled and have advantages over existing systems.⁵⁸ *Flying Whales*, for example, promote their cargo airship concept with the slogan “connecting the landlocked world to the global economy”.⁵⁹ Commissioned by the Dutch Ministry of Economic Affairs and carried out by the Delft University of Technology in 1996, the study “Revival of the Airship” arrives at the conclusion that cargo airships would only be profitable as carriers if they were used to transport either heavy or voluminous-but-light goods. According to the scientists’ findings, conventional traffic routes are more cost-efficient for customary transportation.⁶⁰ The idea of avoiding complicated, expensive, and slow heavy haulages simply by relocating them to the sky via airships is enticing and seems to work well as a marketing strategy, even though a sellable cargo airship has yet to be produced. Cargo airships would also have to be cheaper to operate than cargo helicopters, or capable of carrying heavier loads and covering greater distances.

The term utopian is intended as a non-judgemental description of a technology that does not (yet) exist in the market in its desired form.

Despite failed projects, such as the *Cargolifter CL 160*, the *Sky Hook JHL-40*, or the *Megalifter*, projects for cargo airships continue to emerge undeterred. Many have utopian traits, especially those geared towards complete or at least a high degree of sustainability.⁶¹ The term utopian is intended as a non-judgemental description of a technology that does not (yet) exist on the market in its desired form.⁶² The question is

58 Due to the concise nature of this contribution, other aspects, such as the “safety of airships”, were omitted intentionally and can unfortunately not be explored in detail.

59 Flying Whales website: <http://flying-whales.com/en> (Accessed: 6 April 2021).

60 Landewers, Arno, n.y., Rigid Airship Design. Rise and Fall of a Dutch Airship Manufacturer, p. 3. <http://landewers.net/Rigid%20Airship%20Design-UK.pdf> (Accessed: 8 April 2021).

61 On the concept of technological utopianism compare Woschek, Anke, 2012, Zwischen Luftschloss und Prognose: Der Terminus der „technischen Utopie“ im Fokus der Technikgeschichte, in: Neumeister, Katharina/ Renger-Berka, Peggy/ Schwarke, Christian (ed.): Technik und Transzendenz. Zum Verhältnis von Technik, Religion und Gesellschaft, p. 147-161.

62 As of March 2021.

also whether cargo airships are fully implementable in the form promoted by these projects. However, the author raises this question without having to conclude whether the (past) endeavours failed for technological, economic, or social reasons.

Open Questions and Problems of Cargo Airships

Many technological problems would need to be solved to construct a functioning cargo airship. The process of loading and unloading, for instance, always requires balancing. Otherwise, the airship would simply rise into the sky or not lift off at all. Creating this kind of balance for heavy transports would be an extremely elaborate procedure. Some companies are trying to solve these problems by experimenting with measures such as water or sand pumps, or the exchange of gas and air from tanks.⁶³ So far, these systems only seem to be suitable for continuous loading and unloading. Heavy transports, however, would require immediate load balancing.

Another challenge is landing on different kinds of surfaces in areas without landing masts or hangars, for instance, after catastrophes. However, these systems cannot replace landing masts or hangars in the long term. Hence *Lockheed Martin* developed an air cushion system for the *LMH 1* that closely resembles Igor Pasternak’s system for the *Dragon Dream*. These similarities can be explained by the relatively small circle of airship developers who often change employers or strike out on their own after failed projects and take their technological knowhow and solutions from other developments with them.⁶⁴

The lack of experience in building large airships that have not been produced for generations could pose a further problem. Providing an airship with the payload required for heavy transports would necessitate a massive increase in volume. It remains to be seen whether new technological possibilities can compensate for this loss.

Besides purely technological problems, economic factors and the question of acceptance also play a role. The complex approval procedures needed for this novel type of airship are

63 Laskas, Jeanne Marie: Helium Dreams. A New Generation of Airships is Born. *The New Yorker*, 29.02.2016, <https://www.newyorker.com/magazine/2016/02/29/a-new-generation-of-airships-is-born> (Accessed: 6 April 2021).

64 Cf. *ibid.*

not yet in place and will take time and money to develop. Despite a certain amount of funding,⁶⁵ investments remain insufficient as do financially powerful buyers and markets. The risk of a financial loss, for instance through accidents⁶⁶, is not to be underestimated and would need to be covered by insurance. As with the approval procedures, empirical values and methods have yet to be established. Consequently, the risks are not fully assessable for insurances, and could produce high costs for airship developers.

Without multi-billion investments that extend beyond mere research and the development of prototypes, the infrastructure needed for airships cannot be established (yet). There are no hangars, anchor masts, or well-trained (flight) crews for the efficient operation of airships.

Small experimental models, such as the *Cargolifter* on a scale of 1:8 and remote-controlled prototypes, such as the unmanned solar airship *Lotte*, have been able to provide technological solutions⁶⁷ on a small scale. However, they are not axiomatically applicable to the gigantic cargo airships needed to fill a real market niche. Nor do the smaller prototypes prove that the combination of different technologies can function in a big airship. The question of whether solar propulsion can provide enough power for the weight of a cargo airship thus remains unanswered.

The Manifestation of the Utopian Aspect: Cargo Airship Ideas of the Past

While marketing experts and airship enthusiasts claim that cargo airships are about to revolutionise the transportation of goods, as promised by *Lockheed Martin's Hybrid Airship*⁶⁸ and the media⁶⁹, a look at history reveals the utopian nature of these

projects. Marketing strategies for sustainable cargo airships are anything but new. The Verein für Luftschiffahrt e.V. (Association for Airship Travel) in Ludwigshafen compiled an extensive collection of material and reports on the return of airships. These volumes run until 1986 and can be accessed at the Zeppelin Museum. Different reports in this collection show that the arguments for (cargo) airships have hardly changed.

The association maintains that Zeppelins could even be employed "as aerial cranes in clearing operations" and would be ideal as transporters for the evacuation of people and objects in catastrophes and could also serve as "flying hospitals".⁷⁰ The unchanging arguments and recurring announcements of soon to be produced cargo airships are especially manifest in the collected newspaper clippings, of which only a small selection can be presented here. On 9 November 1962, the *Osnabrücker Tagesblatt* explained in its article "Kommt der Zeppelin wieder (Will the Zeppelin return?)" that "airships would be extremely advantageous for the transportation of bulky goods and for long distances."⁷¹ On 8 January 1975, the *Bild Zeitung* announced that in just a few years a "giant Zeppelin" by the company Dornier would be able to transport 500 tonnes of freight from Hamburg to New York in 32 hours.⁷² In the 1984 edition of *Aerospace America*, Bruce Frisch promoted the airship as an alternative to the helicopter for the removal of trees from inaccessible terrain.⁷³ An excerpt that appeared in "Engineering" on 29 November 1968 and unfortunately only exists as a fragment describes the airship as an "ideal cargo carrier".⁷⁴

In 1968, the publishing house "Junge Welt" circulated a paper model sheet in the former GDR. The fictive Soviet cargo airship it promoted would have been able to carry 80 tonnes and yield considerable profit – had it truly existed. Besides Soviet studies that were supposed to prove the efficiency of the mythical airship, the text cites the scientist Konstantin Eduardovich

65 In the USA, for example, government funding for surveillance through airships was greatly increased after 9/11 2001. Cf. Laskas, Jeanne Marie: Helium Dreams. A New Generation of Airships is Born. *The New Yorker*, 29.02.2016, <https://www.newyorker.com/magazine/2016/02/29/a-new-generation-of-airships-is-born> (Accessed 6 April 2021).

66 This was the case with *Dragon Dream*, *Airlander 10*, and *AU 30* prototypes.

67 Among other things, *Lotte* proved that a small remote-controlled airship can be powered with solar energy and was employed successfully for scientific measurements.

68 Lockheed Martin website, subpage on the Hybrid Airship, <https://www.lockheedmartin.com/en-us/products/hybrid-airship.html>, (Accessed: 6 April 2021).

69 E.g.: Young, Chris, Is that a UFO? No, It's a 600 Ton-Capacity Russian Cargo Airship. Russian firm Aerosmena's plans to build enormous cargo airships may be more than just hot air, interesting engineering, 19.03.2021, <https://interestingengineering.com/ufo-russian-cargo-airship>, (Accessed: 6 April 2021).

70 Verein für Luftschiffahrt e.V. – Ludwigshafen/ Rhein (et al.): *Die Welt der Luftschiffe*, January 1975 edition, p. 6.

71 Verein für Luftschiffahrt e.V. – Ludwigshafen/ Rhein (et al.): *Die Welt der Luftschiffe*, winter 1985/86 edition, p. 6.

72 Verein für Luftschiffahrt e.V. – Ludwigshafen/ Rhein (et al.): *Die Welt der Luftschiffe*, January 1975 edition p. 10 und Verein für Luftschiffahrt e.V. – Ludwigshafen/ Rhein (et al.): *Die Welt der Luftschiffe. 200 Jahre Luftschiffahrt 1783–1983, 1985 special edition*, p. 116.

73 Verein für Luftschiffahrt e.V. – Ludwigshafen/ Rhein (et al.): *Die Welt der Luftschiffe*, winter 1985/86 edition, p. 30.

74 Verein für Luftschiffahrt e.V. – Ludwigshafen/ Rhein (et al.): *Die Welt der Luftschiffe*, 1971 edition, unpaginated.

Tsiolkovsky (1857-1935) who allegedly promised 100 % pure profit from the investments in an airship of this kind.⁷⁵ Interestingly, Hans Råde's cover drawing for this paper model is frequently used to illustrate articles about the comeback of airships. This is exemplified by the cover picture of the 1985/86 edition of "Die Welt der Luftschiffe (The World of Airships)" by the Verein für Luftschiffahrt e.V.⁷⁶ and an article with the heading "Kommt der Zeppelin zurück? (Will the Zeppelin return?)", which is part of the Zeppelin Museum's collection but is unfortunately not attributable to a specific source.⁷⁷

The return of airships as cargo carriers has also been promised in other parts of the world. On 9 February 1971, the "Comeback of the airship" was thus heralded in an article in the Rand Daily Mail in Johannesburg, which foresaw a 500-tonne cargo airship as one of its potential manifestations.⁷⁸

Dreams of technological utopias

Despite the consistently good prognoses and frequent announcements of a return of airships in the shape of gigantic cargo carriers, to which more recent promises also add increasing eco-friendliness, a functioning cargo airship has yet to be built. In March 2019, a competition to transport a three-tonne container over 300km via airship was announced at the *Aviation Innovations Conference*. The fact that this feat remains unaccomplished stands to reason⁷⁹. Until the many questions and problems have been solved, cargo airships, and especially those geared towards sustainability, are no more than technological utopias.

These great expectations reveal the airship's versatility as a projection surface for current topics.

75 Paper model sheet "Sowjetisches Lastenluftschiff (Soviet cargo airship)", publishing house "Junge Welt" editorial department "MODELLBOGEN (model sheet)" constructor: Siegfried Beutler, cover drawing: Hans Råde, year of publication: 1968 (inventoried under the number F 1994/ 113 at the Zeppelin Museum and reconstructed by Jens Schenkenberger under the number ZM 2020/ O97).

76 Verein für Luftschiffahrt e.V. - Ludwigshafen/ Rhein (et al.): Die Welt der Luftschiffe, winter 1985/86 edition, p. 30.

77 The article appeared before 16.01.1978 and is inventoried under the number F 1991/138.1.

78 In the source collection, the newspaper is given as "Rand Bus[s]ines Mail". However, it must be the business section of the "Rand Daily Mail", which existed until 1985. Verein für Luftschiffahrt e.V. - Ludwigshafen/ Rhein (et al.): Die Welt der Luftschiffe, 1971 edition, unpaginated.

79 Lobner, Peter, Modern Airships - Part 1, 18. August 2019 (Last update: 3 April 2021) <https://lynceans.org/all-posts/modern-airships-part-1/> (Accessed: 6 April 2021).

Paper model sheet and completed model of the "Soviet airship". Model construction: Jens Schenkenberger. Cover drawing: Hans Råde. Photo: M. Tretter / Zeppelin Museum Friedrichshafen



Lauded as sustainable, faster, and cheaper transportation alternatives today, airships were glorified as miracle weapons up until the First World War and subsequently underwent a reinterpretation as messengers of peace.⁸⁰ These great expectations reveal the airship's versatility as a projection surface for current topics, its flexible employment as a marketing tool for important issues of our time, and the pertinacity demonstrated by a small circle of airship enthusiasts who continue to entertain, explore, and intensively market these ideas.

Felix Banzhaf is a researcher in the Zeppelin Department at the Zeppelin Museum, Friedrichshafen, Germany. He is interested in the reception history of airships and the various forms and contexts in which airships appear, often fictitiously.

80 More information on the topic is provided in the contributions in the volume „Luftschiffe, die nie gebaut wurden.“ (Meighörner, Wolfgang/ Zeppelin Museum Friedrichshafen, 2002, Luftschiffe die nie gebaut wurden, Verlag Robert Gessler, Friedrichshafen.)

SHEDS 1 AND 2

THE LARGEST AIRSHIP

SHEDS IN BRITAIN

247M / 812FT LONG

84M / 275FT WIDE

55M / 180FT HIGH

AIRSHIPS

BARRAGE BALLOONS

GAS EXPLOSION

EXPERIMENTS

BATMAN BEGINS

THE DARK KNIGHT RISES

PART TWO SHEDS



Moving Sheds

The History of a Collection Moving Home

Alastair Lawson

A story of hard work, effort, and determination by a band of enthusiasts, who persevere to conserve the history of the British airship, whilst every obstacle is thrown in their way.

The First Shed becomes two... 1917-1936

Cardington, or the Airship Sheds, started life as the Short Brothers Airship Works. In 1917 the aviation manufacturing company chose the Cardington location to site their workshops and airships shed, to construct airships which they had been contracted to build for the Admiralty. A first rigid airship, the R.31, plus a factory, workshops, design building, giant airship shed, gas-making plant and a housing estate for workers, named Shortstown after the company itself, were constructed and completed in just two years and two months.

In the beginning there was only one shed, which dominated the Bedfordshire skylines. Then in 1924 the Imperial Airship Scheme, agreed by Parliament, that larger facilities were needed to design and build the larger ships. The Government had taken over the original Shorts Airship Works, and renamed the facility as the Royal Airship Works, Cardington. The original shed, known as Shed 1, was raised, and lengthened. The new second shed was dismantled from the Royal Naval Airship Station at Pulham in Norfolk and re-assembled, next to Shed 1, at Cardington. A 200ft mooring mast followed and the work was completed by 1928, in time for the construction of the R.101 and the arrival of the R.100.

Over the summer of 1930, the optimism for the airships grew with the successful transatlantic voyage of the R.100, and even the arrival at Cardington of the famous German globetrotting airship, the Graf Zeppelin. However later that year, with the tragic loss of the R.101 and the decision to await the future Government Policy for airships, the station was put on a 'care and maintenance' position. In 1932 the Royal Airship works continued with balloon development in Shed 1, and used Shed 2 for aircraft storage.



Cardington Shed 2
Construction May 1928.
Image courtesy of
Airship Heritage Trust.

It was Leslie Speed, who had been engaged on the 1924 airship programme, who had the foresight to salvage and store a collection of archives and artefacts from the drawing office and workshops during this time.

After the war these formed the basis of a small airship museum, housed in a small hut in the grounds of the giant sheds at Cardington. This later became well known under the voluntary management of the late Frank Kiernan. When he retired from the Civil Service in 1981 the collection was crated, and moved from the small shed into storage at the historical Royal Airship Works, known at the time as Royal Airforce Establishment, Bedford.

Formation of F.O.C.A.S. 1985

In 1985, the late Geoffrey Chamberlain, author of 'Airships-Cardington', became concerned about the future integrity of the collection and together with relatives of the 1921-34 airship programme, set up the 'Friends of Cardington Airship Station' (FOCAS). After Geoffrey's untimely death in 1986, FOCAS was incorporated as a Company Limited by Guarantee and a Registered Charity, later to become known as the Airship Heritage Trust (AHT).

The Trust was given access (rent free) to a part of the workshop buildings. These had been used to create the giant gasbags and fabric shops of the R.101, which were being used by the RAF Museum as a Reserve Collection & Restoration Centre, and where the documentary and photographic archive was stored.

Establishing a Museum - Trials and Tribulations

Following a feasibility study, in 1989 the AHT began planning for a museum to be built within six months, on a site leased from Airship Industries. Airship Industries had been successful in building and operating small non-rigid airships for passenger flights and advertising, operating out of Shed 1 at Cardington. Alas, in September 1990, the company was forced into liquidation by the failure of its main backer.

The '92 Appeal

In the process, the AHT was offered six acres of land on the eastern side of the airfield. With just 24 hours to make up our minds, we agreed to buy the new site and an application was made to Bedford Borough Council for outline planning permission to build a museum. Sketch plans were drawn up for a museum on the site and a £1m fundraising campaign launched.

Enlargement of the RAF Display and Shuttleworth 1993

To help the Trust, the RAF Museum allowed us to expand into four rooms in the old Royal Airship Works, three of which our Curator, Dennis Burchmore (Den), turned into a large attractive display area. At last, we were able to accept visitors, albeit by appointment, as we were behind the wire of the Royal Air Force unit, still active at Cardington.

During this time, hundreds of visitors came to look at our material and the famous Cardington Sheds. There were large models and dioramas which demonstrated the size and details of the great airships. Den became renowned for giving excellent tours of both the shed and the collection itself. A further invitation to establish a small interim 'lighter-than-air' display at the Shuttleworth Collection at Old Warden was offered. In due course, an extensive display of storyboard models and diorama was created.

The Heritage Open Days

In 1994, English Heritage asked the Building Research Establishment, at the time occupying No 2 Shed, to give access to listed buildings not usually open to the public.

Then, and again in 1995, the AHT was invited to stage a display. Amongst the 9,000 plus very enthusiastic visitors who came through these large displays each year, there were sufficient members of the Bedfordshire County Council for us to convince them that a museum was needed.

The National Lottery Application 1997-8

With the advent of the National Lottery in 1994, a new source of potential funding was available, and Bedfordshire County Council decided to fund a formal Feasibility Study to determine the best site for the museum.

The Feasibility Study was accepted by the County Council. AHT recommended an application to the Heritage Lottery Board for a significant sum to allow the purchase of Shed 1, its refurbishment and the establishment of a national Airship & Balloon Museum in one half of the shed. The other half would be used commercially (preferably by an airship company). However as time ticked on, and opinions changed within the Heritage Lottery Organisation as to funding of large out of town projects, we were advised not to submit a bid.

We were warned that there was considerable resistance amongst the Heritage Lottery Board Trustees to giving money to new museums. At the time there had been some contentious Lottery applications and we decided to delay the application.

We become 'Homeless' 1999

Whilst we were still recovering from this setback, the Ministry of Defence closed No.217 Motor Unit (based at RAF Cardington) and the buildings we were in, and planned to sell the whole site. As a result, AHT was given an eviction order to be effective from January 2000.

We were agonising over the possible options to house the collection when we received a surprise phone call from the Shuttleworth Trust. They invited the AHT to co-locate with the Vintage Aircraft Collection at Old Warden.

Initial discussions resulted in a three year lease of two offices at old Warden Park and two large storage sheds in agricultural buildings on one of the Shuttleworth Trust Farms. So more sheds in our life.

The AHT and the collection moved to Old Warden at the end of 1999. The move took ten days and a fair amount of blood, sweat and tears by our curator Den Burchmore and fellow members of the Trust.

Discussion on a Museum 2000-1

However, the Shuttleworth Trust could only offer a site behind the existing aircraft hangers which limited the size of the building. There was no scope for expansion.

The World Changed

Then in 2006 we were offered a helping hand by the Royal Navy Fleet Air Arm Museum in Yeovilton (FAAM) who had become interested in housing a major part of our collection. As the collection had been stored since leaving the Shuttleworth Trust site earlier that year, it had to be protected, and was classified as a collection at risk.

The collection was moved to FAAM under expert supervision and is stored, cleaned and catalogued to the FAAM's highest museum standards. Artefacts from the AHT collection can be shared with other museums and were put on show as part of The Higgins Bedford's 90th anniversary display.

Smaller Sheds

During this time, former curator Den Burchmore and other members of the Airship Heritage Trust, continued to make airship history and materials available to enthusiasts. By undertaking talks and taking along interesting artefacts from their own collections, members of the Trust looked to help and inspire those young and old.

Den's personal collection of photos, books, memorabilia and archive housed in his shed was open to those who had an interest in airships and Cardington. It was a perfect place to be welcomed and have a chat. Hopefully in the future, the AHT collection, along with Den's personal artefacts, will be shown in a larger shed for all to appreciate. As we have learnt in our history, airship sheds come in all shapes and sizes.

Alastair Lawson is Chair of the Airship Heritage Trust

Keeping the story alive

Cultural memory and loss

Lydia Saul

What does it take to keep our recorded memory alive for future generations? What is at stake if it's lost? As the designated keeper of the local history and identity of Bedford, these are questions we ask ourselves at The Higgins Bedford on an almost daily basis. Cultural memory is powerful. It connects us with humanity's collective experience and knowledge. Yet the story of the airship in Bedford, represented even to this day on a massive scale by Cardington Sheds, had become fragmented to the local community.

Over time, the remaining archive of the Bedford airship history had been broken up and spread out amongst the Airship Heritage Trust, the Royal Navy Fleet Air Arm Museum at Yeovilton, the Shuttleworth Trust, Den Burchmore's private collection in his garden shed, and our own collection at the museum. Could the collective cultural memory locally suffer the same fate of fragmentation and was this something we could risk?

The Higgins Bedford contains a significant number of items that reference the airship heritage for the local area within our social history collections. When Bedford's two museums, the local history Bedford Museum, and the Cecil Higgins Art Gallery merged in 2005, it began a period of reflection and growth on the role of the museum for the local community and Bedford's identity. We sought to develop deeper dialogues with the wider airship community and understand what our role, as the local history museum, could be in communicating the history, developing new perspectives and inspiring future generations.

In 2010, to commemorate the 80th Anniversary of the flight of the R.100 and R.101, a special exhibition of items loaned to Bedford shared the story of these two record-breaking airships. This was a really important exhibition in forming strong relationships with the Airship Heritage Trust and the Royal Navy Fleet Air Arm Museum. There were some significant loans including bunk beds, personal effects from the crew and a gramophone that was a present and had flown to Canada and

back on the R.100. We had a great deal of interest both locally and nationally in this exhibition, with visitors coming from Yorkshire who had family members who had been on the crew of the R.100 and R.101. We also had a visit from staff connected with the Zeppelin Museum in Germany. Following this exhibition some additional items were donated to The Higgins Bedford collection, including an autograph book and some commemorative plaques, made from the material left over from the copper pipe by a plumbing engineer.

The anniversary exhibition led to the museum developing the airship narrative installed in the permanent galleries in 2013. The earlier exhibition had paved the way to borrow objects, models, images and film connected with the airship heritage and share this important national story of endeavour. Our permanent displays comprise loans that include a model of the airship and mast, personal items retrieved from the crash site of the R.101, the gramophone that had such appeal in the 2010 exhibition, commemorative cards and memorabilia connected with the crash, equipment for checking the gas bags and a unique piece of film from the Royal Air Force Museum at Hendon. This shows the testing that took place and some of the trial flights of the R.101 around Bedford.

In 2017 a new exhibition at The Higgins Bedford focused on the centenary of the formation of the airship industry in Bedford by the Short Brothers during the First World War, and the legacy they had left in naming Shortstown, a garden village to accommodate their workforce. This exhibition had particular local relevance and we worked with Shortstown school with a 'design an airship' postcard competition extending local links with our communities. We contacted the great great niece of the Short Brothers to share more of her family story and focused on the building of the airship sheds as key landmarks. Again, partnerships were solidified in loaning early airship items from the Royal Navy Fleet Air Arm Museum and the exhibition being sponsored by the Airship Heritage Trust. The accompanying Airship Association conference attracted international visitors from India, America and Canada, who came to hear and share academic papers as well as visit the museum's displays and airship landmarks.

Around this time, we were developing a deeper dialogue with cultural organisations in the town and in particular, Bedford Creative Arts. Through their work with the local community they'd observed an increased fascination in Bedford's airship heritage, partly due to the arrival of the new Airlander in the skies around Bedford in 2016. They asked us a question. Together, as a community, how could we look at the heritage in a completely fresh and unique light? As the ninety-year anniversary of the R.101 crash approached, what significance did the story have for today?

Until this point, contemporary commissioning had been a longer-term vision but the direction still undecided. The local history museum and the art gallery, though housed in the same building, still operated independently. An artistic enquiry into the airship history provided the opportunity to develop this vision more directly.

So began a new artistic journey in exploring the contemporary relevance of local history. For the museum, the project has freed the heritage into a new sphere of experimentation. Working with Bedford Creative Arts, artist Mike Stubbs and his collaborating sound and visual artists has developed a new and deeper level of engagement with our audiences. Discussions with the local community have explored sustainability of our environment, new technologies and new scientific discoveries. The community curated archive we've developed for the exhibition has created a deeper engagement with our community. This has been of great value to the museum in our role as keepers of our local history, in rescuing stories and artefacts from the brink of being lost, and in ensuring individuals who had hitherto been barely recognised receive an improved level of documentation and public record.

Airship Dreams: Escaping Gravity is the first contemporary commission and exhibition for the museum. It is a landmark moment in our development and we are interested to understand and learn from how our audiences respond. It was important to us, as part of our ethos as a museum, that the commission reflected Bedford, and engaged our community in the making of it. For two of the artists, Mike Stubbs and Roger Illingworth, to both be from Bedford, is a powerful statement in itself.

Keeping the airship story alive has entered a new phase for us in Bedford. In the last ten years the dialogue has developed from conversations to a cultural partnership with Bedford Creative Arts, an artistic enquiry into airships and deeper partnerships with airship history keepers, from the Airship Heritage Trust to the local community and further afield to the Zeppelin Museum at Friedrichshafen in Germany. As we look to the 100th anniversary we are excited at what we can achieve next.

Lydia Saul is Keeper of Social History at The Higgins Bedford.

R.101 over Bedford.

Image courtesy of Bedfordshire Archives Collection.



A Home for the Airship

Elaine Midgley

Bedford is a town that often openly acknowledges that it lacks an identity that's easy to define. When I joined Bedford Creative Arts (BCA) in 2018 I asked the Mayor what made Bedford unique. In response, he suggested that the river was its finest asset. I commented that whilst the river was indeed a great asset, ultimately defining Bedford as a 'riverside market town' seemed only to confirm its identity as a quintessential 'everytown' (as cited in a 2017 IPPR report⁸¹). Average in respect of employment, industries, population size, retail offer. In reality, Bedford is far from 'everytown' and nowhere is that more apparent than when staring into its rich heritage.

One of the many reasons that we at BCA believe that art is essential for a full life is because it engenders a sense of belonging for communities. Art can support place-making, shaping and enriching by helping communities to have a sense of identity and pride in where they live. As an organisation active in Bedford for 35 years, our work has often delved into the town's history when working with communities to answer the question, 'What makes people proud of Bedford?' We've explored its population and industries; the brickworks, the breweries, the lace-making... but one story has lured us back time and time again. The R.101.

A true 'Titanic' of a story, and yet, one not obviously celebrated visibly in Bedford. Aside from a small collection in The Higgins Museum, visitors and new residents in Bedford could be forgiven for having no knowledge at all of the purpose of those gigantic sheds that loomed on the horizon. So prominent on Bedford's skyline and so silent in their role in shaping Bedford's past – a past that openly embraced endeavour, technological experimentation and international connections. And yet, the moment you engage in a conversation with a resident who does know the story...immediately you see their eyes light up and a sense of excitement and pride take over. A realisation that once upon a time Bedford was the UK's centre for the most romantic

81 Come Together. Lessons from Bedford reaching out to Britain's most isolated minorities. Chris Murray. Institute for Public Policy Research 2017 © IPPR 2017

form of air travel never to be seen again. A sense of pride often mixed with a tinge of sadness that airships, barrage balloons, and Cardington's use as an airfield is a continually dying dream. Literally being eroded with the building of homes at 'New Cardington' with people being made to feel unwelcome if they come near the Sheds as an aura of secrecy is built up around the Hollywood filming that takes place there now.

The impending 90th anniversary of the demise of the R.101 seemed to create a sense of urgency for capturing and exploring community memory. Not only were we going to lose people to old age who had memories of the airship/barrage balloon era, but even those who remembered the site being used for the first flights of the Airlander were soon going to be considered fable-tellers.

Others had of course tried to preserve and celebrate the heritage. The Airship Heritage Trust had attempted to secure funding from the National Lottery Heritage Fund for a museum but to no avail. Their sterling archiving and commemorating of the history has been a valuable resource. Enthusiasts had also made efforts to try and secure the original mooring mast site as a heritage site. Again, no success.

Perhaps we needed to broaden the approach and the question? Who cared about the heritage? Just airship enthusiasts? Or all residents? How do we open up a conversation about Bedford's association with the airship and what it means in a way that instils pride and inspiration and also fuels the missions of organisations like AHT?

It felt obvious that art could be the tool to help through a project that explored the heritage in a new, contemporary fashion. One that didn't pre-empt community desires for permanent memorials or celebration of the Sheds but simply invited the community on a journey of exploration.

Our then Curator Producer, Annie Bacon, selected Mike Stubbs to be the catalyst and creator. Who better to develop an entirely fresh approach than a highly experienced contemporary artist who grew up in Bedford? Someone whose practice was often about machines and transport, who liked to experiment and push boundaries, but also who – as a curator, producer and arts manager himself – would be able to appreciate that a project of

this scale was ambitious for a small arts organisation like BCA and was willing to guide us on the journey.

A series of conversations, research and R&D followed – resulting in meeting people from across the community with stories to tell, not least Den Burchmore and the members of the AHT but also young people and library visitors happy to shake Mike's hand and sit and chat on camera about their memories and sadness. Joy and fascination. As often with a complex project it took time to formulate an idea and secure the funding, but in January 2020 it was obvious that something was going to happen when the Arts Council backed our project and the National Lottery Heritage Fund followed close behind.

We as colleagues and partners have gone on a long and bumpy journey and now we can invite others on theirs, in response to what we have created. What will be key to Bedford will be the public's response to our offering and the conversations that follow. Do people want Bedford to be known as the "Home of the Airship"? Instead of "Welcome to Bedford - riverside market town" do we want people to associate Bedford with the symbol of the airship and see signs that say: "Welcome to Bedford, a town of dreamers and dreams – of exploration and innovation – of proud international connections?". What might that mean for the Centenary of the Last Flight of the R.101 in 2030? Watch this space....

Elaine Midgley is Director of Bedford Creative Arts



INDIA IN SIX DAYS,
AUSTRALIA IN TEN
AND CANADA
NON-STOP IN THREE

PART THREE
DREAMS

Airship Dreams: Escaping Gravity 2021

Mike Stubbs in collaboration with Roland Denning,
Roger Illingworth, Dave Lynch, Rob Strachan and Sam Wiehl

Recreating a drifty and dreamy sensation like sailing through space, *Escaping Gravity* explores a fascination with airships and the human desire for progress, adventure and the unknown. It forms part of *Airship Dreams*, a place-making project commissioned by Bedford Creative Arts and The Higgins, Bedford, celebrating the town's airship industry, past and present.

Lead artist Mike Stubbs worked over a three-year period getting to know the community and the history that has inspired this work, created in collaboration with new media artists Roland Denning, Roger Illingworth, Dave Lynch, Rob Strachan and Sam Wiehl.

The result is an audio-visual immersive artwork and newly composed symphony of sound that rises and falls as a metaphor for the life of the R.101 airship, Cardington sheds, and the themes birth, death and rebirth echoing the lifecycle of the airship.

The work interrogates the tension that existed between the optimism of pioneering endeavour and the consequences of hubris, ambition and folly behind the Imperial Airship Scheme of the 1920s, as a reflection on our contemporary political and cultural landscape.

The visuals are created in *Unreal Engine*, the gaming software that Fortnite is built on. The audience enters a sculptural space, with a video projection filling one wall of the gallery. Choral voices combine with audio reminiscent of airship engines and wind, creating a mythical and meditative journey.

The airship acts as the agent for a multi-layered metaphor, a vast projection surface for ideas, memories and imaginations. It's the next big thing; a lighter-than-air future, as if science might lift us out of our current situation into a better one.

A key inspiration, the R.101 was the flagship of the Imperial Airship Scheme, drummed up after the First World War to make Britain great again. It was the application of science and engineering employed in the name of progress, ingenuity and determination.

It was a gigantic metaphor for innovation and collective adventure but, at its worst, it was a story of hubris and political ambition, using organised labour for the benefit of a few who could afford to take to the air in style.

In this artwork Mike Stubbs and the collaborating artists reach out for a new world beyond the immediate grasp. Remembering his Bedford beginnings as a small boy, from a small town, on a small island, imagining travel and new vistas, Stubbs acknowledges that we are the real time experiment.



Diary of an artwork

In conversation with Mike Stubbs

Between 2020 and 2021 lead artist Mike Stubbs and independent curator Annie Bacon engaged in a dialogue on the making of *Airship Dreams: Escaping Gravity*.

AB What drew you to the story of the R.101 airship?

MS There's this sense of wonder and adventure surrounding the airship. It embodies that idea of science fiction made real and the blurring of fiction with reality. My father was a scientific technician. He worked at Unilever and we lived in Bedford. I grew up around ideas of modernism and the belief in innovation post-World War II. The airship is a symbol from my childhood. I remember the flying days at Shuttleworth, watching barrage balloons and the Goodyear blimp, but not as nostalgia. It was like an echo of my parents who experienced rationing and the new engineering and military understanding from World War II. Bedford for me was a place and time of airfields, motorbike and car racing, the Santa Pod drag strip, tech and innovation. There was also this secrecy. The Cardington Sheds loomed large in the landscape and they were mysterious. I knew a little about the R.101 but it seemed shrouded in the past. Then a new airship, the Airlander appeared in the Bedford skies in 2016. I saw an airship capturing people's imaginations, again.

AB How did you begin to uncover the story?

MS Well I guess we embarked on an adventure. I met Den Burchmore, the original curator of the R.101 archive at Cardington Sheds, and I started to understand the cultural history of the airship programme. I spent a lot of time at Den's house, exploring his remarkable and meticulous personal R.101 archive, carefully located in a 'museum' in his shed which we soon nicknamed 'Shed 3.' Den shared his knowledge of airships and the sheds. I learnt about the activities that took place in Cardington Shed 2, from parachute training to riot-control training and large-scale firefighting. I learnt about the impact of the R.101 airship crash on the local Shortstown community, the decisions that led to the crash and the disregard for human life that left those local families devastated. A story of social inequality, hubris and folly not unlike the Titanic began to emerge. It seemed the fate of the R.101 was another of those schedule-driven technology disasters. Cumulative political pressure, progressive imperialism and a press-driven desire for spectacle collided. All of this, as the Brexit proposition progressed, was looking increasingly prescient. I was someone that for a number of different reasons, really valued the concept of Europe.

At the same time, I was drawn to the mystery of the sheds themselves. These were immense structures of secrecy and home to airships, secret storage, and a place to conduct large-scale activity outside the public eye, from experiments to a secure film set for blockbuster films.



Top: R.101 on the mooring mast.
Image courtesy of Airship Heritage Trust.
Bottom: *Airship Dreams: Escaping Gravity*, 2021.
Mike Stubbs with Roland Denning, Roger Illingworth, Dave Lynch, Rob Strachan, Sam Wiehl.

I wanted to know what the sheds meant to the local community now. I found both irrelevance and emotional attachment, manifest in the following of the Airlander. I was intrigued by this longing for the extension of the airship programme and the excitement of flight and scale. I could see that sense of wonder and the cult of the airship that I felt as a child is still here now.

In a sense it was an open-ended process of embracing place-specific action research, thinking about technology and the spectacle of technology, and what that meant, then and now.

AB The filmmaker Douglas Gordon said if you want to find the truth in something, take it apart piece by piece, then put it back together with the detail of a forensic scientist.

MS I wanted to ask questions, yes. I wanted to get closer to a kind of truth, buried for so long. I wanted to understand more about the metaphor of the airship around escape, hope, future, tech, imagination, and then the underlying facts around greed, hubris, colonialism and labour. About the balance of risk versus recklessness. But fundamentally, that the process of making the work, the deconstruction of the story, would ultimately enable a deeper understanding. At first I think I knew what it was going to look like, but the more we researched and made the work, the less I knew. And I was happy about that. Covid gifted us more time to dig deep and this process has felt very real, collaborative. Early on it enabled me to throw it wide open. All of us are excited by the outcome, but the process of making the work has been the most fundamental journey.

AB There are many lenses through which we can view the story. How did you decide what to leave out and what to leave in?

MS It's been cyclical, in terms of psychology and mood, and in relation to what's happening now, and in our near future. There's futurism and the hope of the airship programme as an emblem of something fantastic, whether that's through being carbon neutral travel or an image of future escape or just an incredible thing in itself, as a spectacle. The projection of something just out of reach, as Felix Banzhaf discusses. That sits on the more positive side. Alongside it I think of Black Lives Matter, and then the impact of colonialism on the rest of the world, and how it's instituted a series of greedy values. Obviously it's more nuanced than that. I swing between the two, as to how utopian or dystopian it is.

All of us in this work, we're exploring a sense of hope in terms of agency or a call to rise up. In *Zero*, a film I made in collaboration with Gina Czarnecki in 2000, I was exploring the experience of weightlessness, and consciousness. I wanted to lift it above the facts of space exploration. In *Escaping Gravity*, I think that really we don't want this to be a dystopian, dark piece of work. We wanted to make something which is beautiful and seductive and is playing with the edges of the deeply philosophical.

AB When I first spoke to you, back in 2017, you were interested in returning to your artistic practice but you hadn't yet taken the leap. You grew up in Bedford and early in your career you made the film *Donut*, working with young fast car

enthusiasts in Bedford. Later, you went off and you were a curator and a director and you did all these things. Is this a return to home or is it more removed?

MS It feels more removed. *Donut* was autobiographical and because I was younger, twenty years ago, in a way it was more about me, more sort of self-centred. I think that the tone of *Escaping Gravity* has moved away from it being about my own experiences of seeing barrage balloons on the horizon or the Goodyear blimp droning over Bedford. This work's more open ended. What is it to go beyond gravity - not tangibly, like space travel - but to escape gravity in our minds? To liberate, free up, let our minds free, to roam, to look at the images that speed by in our minds?

AB This project has been a collective endeavour. You've invited artists you've collaborated with before and invited new artists to work with you too.

MS I'm sitting somewhere between being an artistic director, curator and artist. The work's become more like making a film than anything else. Or perhaps being a composer. I think the collaborative question is partially met by the Unreal Engine, which we're using now. It's an exciting games environment and is proving to be a good collaborative platform. In a sense I'm conceptualising, talking up ideas and then sharing those ideas with artists who can help realise them within this new virtual environment we're working in. We're collaborating in a digital space and it's a different way of working. We've been playing live sequences and then capturing them. This is like shooting film live. Constructing the files to 'play' takes



Airship Dreams: Escaping Gravity, 2021. Mike Stubbs with Roland Denning, Roger Illingworth, Dave Lynch, Rob Strachan, Sam Wiehl.

time and planning and I have been very reliant on Sam and Dave's instincts and technical ability, as they too learned the terrain. I think we've developed a new lexicon and this has pushed our boundaries conceptually and technologically as to what we can do. It's stretched us. Obviously being able to conceptualise something, work in a collaborative way, to ideate it and bring it to fruition is fantastic, through a series of conversations. But it's the conversations that are the most meaningful part of it for me. It's a pure form of exploration.

I've really enjoyed the improvisation and being visceral in the process of making things, and this is by far the longest work I've ever engaged in. That makes it a very different kind of work in so much that it's about social engagement, research, and is much more collaborative than when I set out. Also, the people I've worked with have gone through change, as I have too of course. Even if you're making a piece of work over a 24 hour period, a short work, you're also going through change but it's not necessarily as deep or impactful. I would say my relationship to the art making process has developed and I am increasingly attracted to improvising.

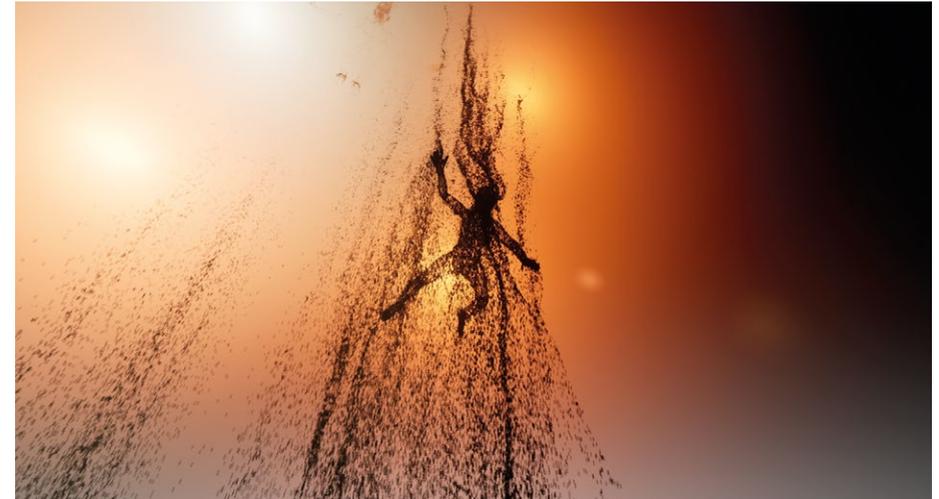
I think that with more time there are more pressures to do different things. The influences shift. It's not like having a very clear brief and then just executing it. When there's contact with more people, different people, the influences and ideas cycle through different concepts and ideas, and I think with time they gain more depth. It's become more politicised and the semiology of the work has shifted.

AB Escaping Gravity continues an exploration of the core themes of innovation and flight in your work. For example, Zero, and Jump Jet.

MS Jump Jet was about the Harrier Jump Jet which was based at RAF Wittering, just outside Peterborough. Basically, a superb piece of engineering and innovation, but it was used in war, and the people of Peterborough had it on their doorstep. I wanted to ask "what's it like to have a Harrier jump jet hovering over your town?" With Zero I was invited as a documentarist to go to Star City, Moscow and document the choreographer Kitsou Dubois rehearse in zero gravity, because she was performing in Zero G. As a filmmaker I was very lucky to get that invitation. Whilst there I also shot some Super 8 which became Zero, a more conceptual piece which was as much about the kind of culture of Star City and cosmonauts. Everything around the Yuri Gagarin Training Centre is cultural, not technical, and a lot of the artists were largely doing experiments in zero gravity, whereas my film became more about the experience, exploring weightlessness and consciousness.

AB You grew up in Bedford. Involving the local community has been a key element of the project to you.

MS At the very beginning I met Den, who was critical to the evolution of the project. I was fascinated by the conceit that he'd become a curator, not knowing what a curator was, and had ended up curating a small airship museum, in Cardington Sheds. Then when that had to close, he decanted that meticulously into his garden shed and that became almost the



Airship Dreams: Escaping Gravity, 2021.

Mike Stubbs with Roland Denning, Roger Illingworth, Dave Lynch, Rob Strachan, Sam Wiehl.

next incarnation of the 'airship museum' and he let people come and visit him in the beginning. The idea of him becoming a curator, having been the Cardington Shed manager, and having an unexpected interview at the Shuttleworth Museum, where he then becomes the Airship Heritage Trust curator. Then when the airship collection closed he decided to put it all in his own garden shed and document it. For me, he's been a critical figure. It was also conceptually interesting for me as an artist. That's not me being a socially-engaged artist. That's me getting into a really good rap with someone. Finding it really fascinating. There's loads of irony, and it's complex. Then meeting Jeanne, his partner. Then I met Alastair, the Chair of the Airship Heritage Trust. Then Trevor Monk, a Bedford resident with an encyclopaedic knowledge of the R.101. To me, there's just so much knowledge in the community. They're people who are following their passion.

AB This getting into a really good rap with someone. Uncovering their passion. Would you describe this as an integral part of your artistic practice?

MS Yes, it's social. It's action research. Meeting people, having a chat. A lot of people have turned up with memorabilia as part of the project. I spent some time in residence, to get to know more people and develop a relationship. It wasn't so much about creating a platform to showcase people's community assets, it was also about the dialogue you can have with those people, more about the relationship with the person than the artefact. There's still scope to explore some more, perhaps in a performance, something more participatory. But part of the dilemma has been, we're not 'celebrating' airship history. There's a tension.

AB Making the work during covid was challenging. Do you have any reflections on that?



Airship Dreams: Escaping Gravity, 2021.

Mike Stubbs with Roland Denning, Roger Illingworth, Dave Lynch, Rob Strachan, Sam Wiehl.

MS In a way, the idea of what we thought life was has gone out the window, not just for me. So any sense of the certainty or expectation of what being an artist is, is under question for any artist now, and in a sense that's how it should be. It raises a question about how responsive to their external environment an artist needs to be, has to be, wants to be, with no binaries. But then at the same time as that, in terms of more fundamental questioning of significance, meaning in life, the value of one activity over another; these are really at the fore for me. Art is just part of that. Or it's both part and all of it. In terms of making the decision to designate oneself as an artist or name a series of activities as art, I'm still attracted to that because it defines a way of being which is better than any other I can think of. It allows and enables a way of dealing with life and it's also convenient for other people. It's a form of licence. It's outside of normal job descriptions and it still enjoys privilege.

AB Do you think that holds true in today's culture?

MS I do. I chose the word privilege to say it's the privilege of having a licence to do things in different ways, and people can still explain away things they don't understand by saying it's art. Or, that guy's crazy, yes, but he's an artist. In terms of the process of helping society, or myself, see the world in a different way, that's the job but it's not necessarily task-based. I don't set out to do that particularly, and I don't think other artists do either. It just becomes a way of life. It's also about what you can get away with. Artists instinctively challenge the status quo.

AB I'm interested in the idea of being an artist as a philosophy of life.

MS I want to refer to John Dewey. Dewey talks about actualisation and experience and I think that there is something

performative about making art that I really like. When I do some filming with one of my collaborators, there's a specific energy. I observed during the Covid period that this was very difficult, that the sense of excitement and engagement makes the collaborative process so important and rewarding. It's very much about being present and sharing that present with other people. Painting on the other hand is a very solitary affair. I've got this admiration for people that go into a studio eight hours a day, live in their own head and make marks, create form. But the collaborative act is much more discursive, like making a film. Chance elements have led to moments of discovery. I think the process of actualisation, which is mostly in the present, is more interesting because it's about leaving a space for improvisation.

It is philosophical, in terms of the stimuli we need to engage heart, soul, intellect. It goes back to asking what paradigm does the art exist in? That also relates back to young people gaming in online environments, because clearly that's where it's really happening. Digital environments are as real as any other now. The idea of a studio is becoming extremely privileged. There may be a few people who've got home studios, really wealthy artists, but most people are going to be working on an iPad or a laptop, in a small room.

AB What do you think we're moving towards?

MS I think that this is an opportunity in terms of moving from analogue to digital, and in looking hard at our relationship to nature. There are some memes at the

moment, around "can't we just improve earth?" When you think about Elon Musk, robotics, AI, in terms of the conflict between what innovation can lead to, and a route out of chaos and destruction, I'm still excited by that promise. I have this inherent hope that technology will save us, from the climate emergency, for example. However, at the same time I feel very conflicted. I have a natural disposition to engage in the dirty, analogue world of mud and matter. Without directly saying it, I think this tension is in the work. Maybe *Escaping Gravity* has become more about escaping into other worlds. Escaping dystopia. But it's not dystopian. It's critical. I want people to see the work and ask questions.

Mike Stubbs is an artist, curator and producer. His work is concerned with the fabric of daily life and references machines, work, innovation, class and identity. Annie Bacon is a curator and producer and was Curator Producer at Bedford Creative Arts during the early development of the Airship Dreams project.

Telling stories

A community curated archive

Lydia Saul

Over the years, many stories of ordinary working men and women who worked on the R.101 have come to light. The airship history is still an incomplete jigsaw and it's surprising how many memories lay waiting still to be uncovered. Knowing that there are families, local historians and airship enthusiasts in the community and further afield who continue to keep the story alive, we invited them, as community curators, to join us in assembling a new community airship archive. This archive, presented here and in the Airship Dreams exhibition, shares the precious memories and accounts of some of those who worked on the airships in those inter-war years.

Harold Rowe. Aircraft engineer. R.33 and R.101.

Community curators Alan and Pat Filby's great uncle and aunt worked on the airships at Cardington. Pat's great uncle, Harold Rowe, joined the RAF and in February 1921 was recruited as a rigger for the airship station at Pulham. Although described as 'thoroughly efficient', he was unfortunately laid off that October due to staff reductions.

In 1925 Harold was assigned to the crew of R.33 and in April was on board when she broke away from her mast during strong gales. The damage sustained caused the nose to collapse and the



crew struggled to bring the airship under control as she drifted backwards and out to the North Sea. Rowe and the reduced crew regained control and rescued R.33, returning to Pulham and remaining calm in the crisis. Harold was awarded for bravery by the Air Ministry an inscribed gold watch.

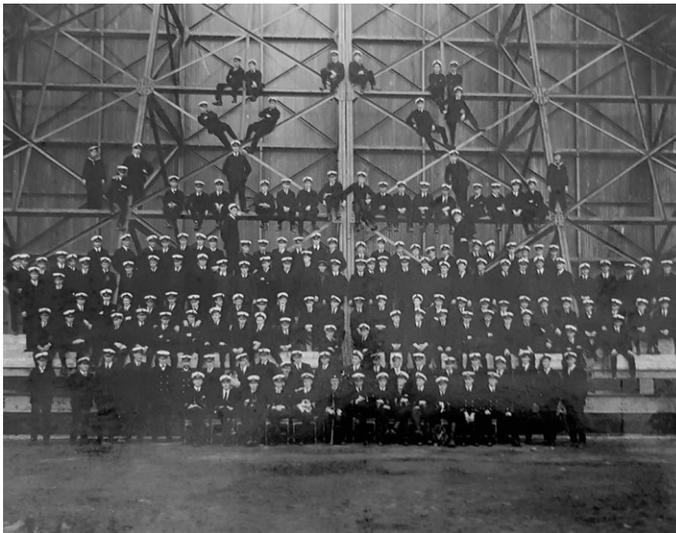


He became an aircraft engineer, licensed to work on airships. Flights scheduled on R.33 were then used for training crew and for experimental testing for larger airships, including the R.101. Even after the R.101 crash, Harold continued to work at Cardington Camp and retired after 70 years service.

Arthur Burton. Mechanical engineer. R.101. Died.

The great nieces of Arthur Burton shared his story. Arthur was born in Hull, his family later moving to Bedford. He was employed as a mechanical engineer on the R.101. He was on board when it departed on its maiden flight to Karachi on the 4th October 1930. Arthur's keys, pocket watch and other personal effects were retrieved from the crash site and used to identify him. They were returned to his family and later donated to the museum at the Cardington sheds. The family also has his small notebook with details of test flights, including miles travelled, fuel consumed and route. A married man of just 29 years of age, Arthur was one of 48 people who lost their lives in the R.101 disaster. His wife treasured a small silver brooch of the R.101, a gift bought by Arthur on the launch of the airship which remained pinned to the lapel of her jacket all her life.

Arthur Burton, and his effects retrieved from the crash site. Images courtesy of his great nieces.



Gold watch awarded to Harold Rowe for his service during the R33 breakaway incident. Image of airship crew on the Cardington shed doors. Images courtesy of Alan and Pat Filby.

‘Joe’ Binks. Engineer. R.101. Survived. Community curator Derek Binks’ father, John Binks (known as ‘Joe’) was very fortunate to be one of just six survivors of the crash. Joe was born on 29th December 1891 and served in the Navy for 12 years. He joined the crew of the R.101 in 1929 and by 1930 was resident in Shortstown. Joe was working on No.5 engine car on the R.101 when it crashed. One of the water ballast tanks burst over him and Mr Bell, saving their lives from the fire. Joe continued to work at RAF Cardington and was part of the small team who worked on Lord Ventry’s airship ‘The Bournemouth’ in the early 1950’s. Every year, on the anniversary of the crash he would meet Mr Bell at the local pub, ‘The Kings Arms’ to raise a glass to lost friends. Binks Court in Shortstown is named after him.

‘My Dad was an engineer on No.5 car with Mr Bell, I was three years old at the time and we lived in Sheffield. When it crashed they both got out because the water tank exploded above them. They used to go to Shortstown club and ... discussed it among themselves, not with the boys.’ Derek Binks

D.C. Forster. Senior staff member.

Gas bag and outer cover production.

There is little historical evidence for the experience of thousands of women who worked in the fabric shop at Cardington. They worked on the airship outer covers and gasbags, the weather balloons and barrage balloons. Alastair Lawson, Chair of the Airship Heritage Trust, was entrusted with a special photograph album donated by community curator Alan Slater. It contains a collection of newspaper cuttings and personal

photos of D.C Forster, a senior female staff member in gas bag and outer cover production.

The album is all the more interesting for its snapshots of Royal Airship Works life, including the surgery, images of the R.33 in flight and workers’ sports days. Reading the newspaper articles pasted into the album, more details of the mysterious D.C Forster emerge. She not only managed outer cover production, but was also interviewed by journalists about manufacturing processes during the airship’s construction. She was on hand during press and MP’s tours of the ship and is confirmed to be the “girl in the deckchair”, a photograph reprinted many times to show relaxed life on board. The caption in the album is “Self & Sqn. Leader Johnson promenade deck”.

The album is a remarkable record of life at the Royal Airship Works. Forster documented girls employed after the tragic crash of the R.101 in 1930 (it was previously presumed that staff were laid off). She was a senior member of staff and the album contains an invitation given by the Hanworth Club for the visit of the Graf Zeppelin in 1931.

The final pages show the ‘Outer coverettes’ still employed and happy in 1932 ‘towards the end’. This fascinating album has opened up a world of detail of life at Cardington, thanks to Alan Slater discovering who ‘the girl in the deckchair’ really was.



Images from D.C. Forster’s photograph album. Courtesy of Alastair Lawson, Airship Heritage Trust and Alan Slater.



Hilda Lyon. Image courtesy of Dr Nina Baker from the Edith Greenwood Archives, with permission of the family.

Edward Thomas Smith. Carpenter. R.101. Nigel Lutt, Bedfordshire Archivist and local historian has a personal collection of airship related objects including the Territorial Army long service medal awarded to Edward Thomas Smith (d.1965) a carpenter on the R.101 during construction. Nigel discovered that Edward was a caterer in civilian life and had been employed as a steward during the trial flights of the R.101. From a Beds and Herts regiment article, dated spring 1930, Edward says ‘no one need worry about flying on the R.101’.

George Jakings. Ground Crew. R.101.

Another medal and documents previously belonged to Jakings, a member of the ground crew who assisted in manoeuvring the airship onto its mast at Cardington. His employment ceased in autumn 1930, after the R.101 crash.

Hilda Margaret Lyon, Engineer.

Hilda Lyon invented the streamlined ‘Lyon shape’ for airships and submarines. She joined the Royal Airship Works in 1925, researching transverse frames and contributing towards the R.101 design. The first woman to win the R.38 Memorial Prize, she later became Principal Scientific Officer in aerodynamics at the Royal Aircraft Establishment.

George William Cooke. Rigger and carpenter. Cardington Sheds.

Community curator Nick Cooke’s grandfather was a rigger and carpenter who worked at Cardington from 1917 to 1930. George William Cooke was born on 14th September 1875 and trained as a carpenter in North London. In 1912 he moved to Rochester, where he worked for Short Brothers building seaplanes.



George Cooke, far right with hand on his hip. Image courtesy of Nick Cooke.

In 1915, when the Short Brothers were commissioned to build two airships for the Admiralty, George moved to Cardington. In 1917, he and his wife Rose became licensees of the Kings Arms pub. George was responsible for wiring airships like the R.38 and R.101. Nick kept George's tool chest safe and it is amazing that these tools are the actual tools that skilfully crafted such huge airships.

The mooring mast 'bungalow'.

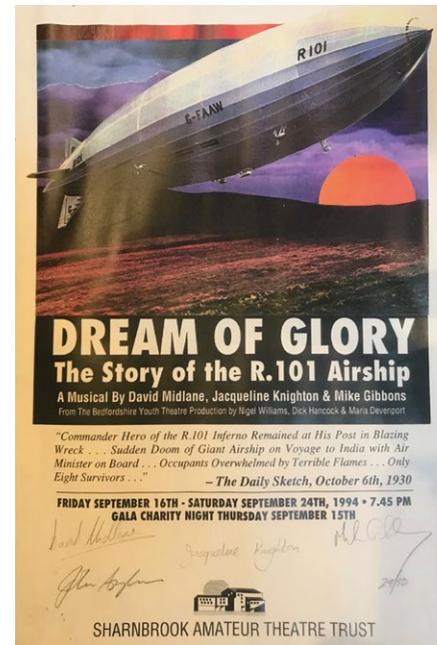
John Benson has a very special story about the mooring mast site. The R.101 mooring mast was demolished in 1943, but the surrounding buildings remained. John's parents, Dudley and Marjorie Benson, were without a home at the time. His father worked at Manor Farm, Cotton End, on land rented from the Air Ministry and was offered a large wooden hut on the site as accommodation. The family moved there in late 1947 when John was 2, his brother Tony 4 and his sister Margaret was born the following year. Their home, 'The Bungalow' could be cold in winter and baking hot in summer. They had running water, a flushing toilet



The Benson Family at Mast Road, Cardington. Image courtesy of John Benson.



Den Burchmore inside his shed. Image courtesy of The Higgins Bedford.



Dream of Glory Poster. Image courtesy of Mike Gibbons.

and a boiler for heating bath water, but no electricity and used paraffin lamps for lighting. John's fondest memory was that they had plenty of space to play, the whole site being something of an adventure playground.

Den Burchmore. Airship Heritage Trust Curator and Community Curator.

Den Burchmore worked at Cardington Camp in the 1950s. He worked on site and facilitated access for many different uses, such as training fire-fighters. After retiring, he became curator for the Airship Heritage Trust collection, housed at Cardington sheds. This collection was later transferred to the National Museum of the Royal Navy at Yeovilton. Den also established his own personal airship heritage archive, which he kept in his own (garden) shed. This rich collection of scrapbooks, artefacts, magazines and books is a tribute to Den's work to preserve this information and share it with others. His dedication and passion has inspired some of our community curators and through his words and collection he has inspired a future generation to dream.

'Dream of Glory.' A play by Nigel Williams, Dick Hancock and Maria Devenport.

Mike Gibbons shared memories of the Bedfordshire Youth Theatre production 'Dream of Glory', by Nigel Williams, Dick Hancock and Maria Devenport. The play was originally staged inside a marquee at Cardington Shed 1 as part of the 60th anniversary commemorations of the R.101 disaster in 1990. Geoff Deacon and his wife Pamela, Landlords of The Bell Pub at Cotton End, have fond memories of the youth theatre cast members meeting after rehearsals to learn their

lines and even staying overnight on one occasion. Mike, with David Midlane and Jaqueline Knighton adapted it to be performed at Sharnbrook Mill Theatre in 1994 and then recorded for broadcast on BBC Radio Bedfordshire (now BBC Three Counties Radio).

They had the assistance of the Airship Heritage Trust, including Den Burchmore and Chair Group Captain Peter Garth, who together with President Sir Peter Masefield (author of 'To Ride a Storm') organised access to materials and the shed. They also had the resources of BBC Radio Bedfordshire who had broadcast a series called "The Imperial Dream", produced by Colin Burbidge. The story of one of the main characters, Irene Capon, gave a fresh perspective. Unlike survivors like Cook and Disley, whose interviews are documented, there was nothing about her fiancée Sam Church and his family. Irene was still alive 60 years later, but sadly not able to contribute due to ill health.

The recordings of 'Dream of Glory' with interviews about the production have recently been made available by the Invisible Folk Club.⁸²

After the Sharnbrook Mill Theatre show, the cast and families visited Cardington and The Bell pub, then travelled to Beauvais to the crash site and the museum (now closed) that had been set up in the town.



Airship Dreams poster.
Image courtesy of James Knight, a student at Bedford College.

To add to the archive we invited pupils from Shortstown Primary School and students at Bedford College to respond to the stories. The young pupils worked with artist Anne-Marie Abbate to create replica object boxes and colourful airship models. The Bedford College students responded to Den Burchmore's oral history recording and their animations and poster designs are part of the community curated exhibition.

Lydia Saul is Keeper of Social History at The Higgins Bedford. Her work focuses on Bedford's social and industrial history, and community engagement and representation in the development of museum collections.

Airship Dreamers Club

Shortstown children and the history on their doorstep

Kayte Judge

Airship Dreams: Escaping Gravity not only encourages its audience to dream about flight but has, as one of its more terrestrial goals, the engagement of the local community in the engineering heritage of the local area, and Bedfordshire's links to the airship industry. The education programme was designed to engage with schools in a way that both practically supports curriculum needs as well as piquing the interest of children and young people into the themes of the artwork. More prosaically it is an unapologetic attempt at deeply engaging the future audience of the exhibition in the realm of airships, exploration, and the power of the imagination.

Creating this work in parallel to Mike Stubb's development of the artwork itself required us to design a programme that spoke to the themes of *Airship Dreams: Escaping Gravity as they developed*. Working with schools requires, usually, clarity and structure for them to be able to find time in their already eye-wateringly busy school year to engage. Open-ended exploratory work with a school is a rare extravagance. Then, there was covid. Business as usual was not an option and we instead decided that it was time to push our collaborative practice to the next level.

Our education work to date at Bedford Creative Arts (BCA) usually takes the shape of either an education programme

developed in consultation with education colleagues and then offered to schools, or through a supported brokerage approach in which we support and coach schools to develop their own projects and commission artists themselves. In this case we decided to move further toward co-development of the programme than we have done before.

We knew that if any school were ready to develop their exploration of the themes arising from the *Airship Dreams: Escaping Gravity* work it would be Shortstown Primary. The school is based close to the Cardington sheds, serves the town that was built to house the airship workers, and even has an airship as their school logo, but in truth more important than all of this is their trust and openness in partnership working. BCA have worked with Shortstown Primary school for many years and there is a trusted working relationship. They tend to say yes.

Due to the delays of Covid-19 our first job in developing materials for children and young people was to develop The Airship Dreamers Club: a series of creative activities designed for primary aged children supported by a bank of online videos including a mini-documentary about airships presented by Milkshake TV presenter Dr Sita Thomas, supporting videos for the 'Airship Dreamers Club' activities and a wide range of supplementary material.

82 Invisible Folk Club. www.invisiblefolkclub.com

Armed with these resources we approached Shortstown Primary to ask them if they would be willing to co-develop learning materials and trial novel approaches to the topic of airships and flight. Shortstown Primary, who follow a topic-based model, dedicated Spring 2 half-term to the topic of Airships to provide an immersive learning experience for their whole school. BCA provided a range of resources to the school: the 'Airship Dreamers Club' suite of activities that included heritage factsheets, information about the lead artist, science experiments, art activities, literacy activities, a reading list, and the opportunity to think about making their own mini museum based on 'Den's Shed' through a 'cut, colour and make' activity; and the supporting videos. Further to this The Higgins Bedford sourced fourteen large scale historic pictures for each class, plus fourteen boxes containing 'curious objects' related to the airships developed by artist Anne-Marie Abbate were provided to each classroom to engender discussion and will ultimately form part of a 'pop up airships museum' in the school alongside the children's own work.

A critical part of the co-development of materials were the four 'creative collaborators' who joined the teachers and pupils in exploring the theme of Airships. These creative collaborators were: multi-media artist Anne-Marie Abbate, oral story-teller Jane Lambourne, science educator Kristina Castle, and actor and filmmaker Richard Mann. Each were funded for seven days of planning, delivery and reflection time with the school, allowing them a day per week during the half term. Each creative collaborator was allocated a year group

to work with and they developed their approach in consultation with the year teachers and worked together to deliver the activities alongside the teachers.

While delivery differed from what was planned due to Covid-19, activities included having a video message from the 1930s sent to the children courtesy of actor Richard Mann, the delivery of the time travelling curious object boxes, which '*...have been amazing for the children*' one Shortstown teacher explained... '*They have explored them and discussed what they could learn from each.*' Storyteller Jane worked with the children to develop stories related to adventure and flight, including sending a letter home to each child. Science Educator Kristina led the children through a series of experiments including the deliciously messy 'paint rockets' which seem to have been a clear success both within science but also within literacy. Artist Anne-Marie worked with the students to develop their own design for an airship, something that every child in the school did, and which resulted in Anne-Marie making large scale models of two winning designs which will be brought together in a stop frame animation later this term.

As an Arts Council England National Portfolio Organisation we had not previously had the experience of contracting both the school and the creative collaborators to respond creatively to a brief, without being actively involved in the delivery. We provided the funding, some digital and physical resources and then stood back. It was a scaffolded approach for sure, but there were opportunities for innovation,

for flexible development of responses and, while the requirement for the teachers and the artists to *work alongside one another* was overt, the way in which they did this was entirely down to them.

The evaluation suggests that the local relevance of the education programme was powerful for the children. The children learnt a lot and '*are definitely proud of where they live now as they are aware of Shortstown's history.*' The teachers learnt a lot with their pupils too: '*it's been really nice; we've learnt together, and the children have liked that as well, the history of the children's families are in Shortstown and they have links to it so they've been able to teach us some things which has encouraged them even more.*' This pedagogical shift which allows the children to be the expert can have powerful impact on the engagement of children in a topic.

The combination of taking a whole-school approach in a topic with such local relevance had a special kind of power, as one of the artists explains '*I think it's (that) the learning that happened on their doorstep and the idea of working together so they are solving these mysteries with these curious boxes.... the idea that the school is working together in a combined effort to create something... even the 3-year-olds were involved in it and up to age 11, that's pretty special.*'

When the Shortstown children visit *Airship Dreams: Escaping Gravity* they will see not only their own work but objects that they will hold some knowledge about. They will see Den's Shed, an object that fascinated many of

the children. Moreover, before they visit, they will have foreshadowed it with the development of their own 'pop-up museum' in their school, further playing with the usual power structures inherent in education, but also within art venues. Working collaboratively in investigating the curious thought of 'escaping gravity' blurred the lines between the separate subjects but also the roles of expert/ teacher/ student/ curator/artist.

Kayte Judge works as an independent cultural education producer and developed the Airship Dreamers Club as Cultural Education Producer at Bedford Creative Arts.

Game Changers

Collaborating artists Roland Denning, Roger Illingworth, Dave Lynch, Mike Stubbs, Rob Strachan and Sam Wiehl reflect on the making of *Airship Dreams: Escaping Gravity* during the 2020 pandemic

A collaboration that went 'virtual' almost overnight

SW Working remotely is something we're all used to in some shape or form, but I think the fact that we'd never worked together, and the starting point was in virtual space in this combo, that was unusual. We don't have any kind of past models to use to understand how each other works or how fast each other works, so everything was all new, all at once. I know Mike from Liverpool, we'd met a few times and there'd been these conversations about a hypothetical airship project. I knew of Dave Lynch but I hadn't worked with him. Rob and I had collaborated together, in a physical space before, bouncing off each other a bit more, doing audio visuals. It's been almost natural to work in a virtual space but as soon as you analyse it you think no, this is strange. There's been no real moment where I thought we were going to meet. You couldn't say "Well we're meeting in two weeks to go through where we're at," that wasn't in the conversation, even at the beginning.

RD Yet I think it's quite important to know what other people are like, and what their personalities are like. Sometimes messages get so distorted over the net and emails and things, and to get the feel of how people work and people's sense of humour or irony, it's crucial.

SW It did make it tougher at the beginning. But then we had these weird emotional 'bromances.' It was as though you couldn't really understand your own emotional controller, locked down in covid. We were all really excited about things. "Oh yeah that's great, I love what you've done" and "Oh yeah I'm feeling that." It was as though our emotions were amplified at first.

RI I tend to get quite excited when I finish something and I love getting comments straight away. It was really important to get that instantaneous reaction from new collaborators and WhatsApp was great for that. It was the only real time that it felt



Lab at The Higgins Bedford, May 2021. Left to right: Roland Denning, Dave Lynch, Mike Stubbs, Sam Wiehl. Photo: Andy Willsher.

like a natural process of jamming. Everybody was working in isolation and then seeing what would work, proving a little slower, less instantaneous.

SW In a physical space you can bounce the energy around. But in a digital space it's less infectious. You get excited still but it's different. There's something about the way work happens when you feel how it goes in a physical space, with people in the space too. On Zoom it has felt more removed. More of a head-led decision-making process as opposed to an emotive-based process.

MS I was surprised with how the tech worked out. Zoom was like a support group for the 'bromance' Sam refers to, of our all-male team, which improved as we realised that's all we had. But I missed not having longer periods of engagement in the same physical space or workshop labs.

RS For me too, the workshops were really the times that we all got a sense of how the piece might eventually feel. And I think that experiential element is key: it's an emotional piece, the narrative has a very human core. In this sense, being in a room with each other is important.

DL It's completely different working on your own, I think. You can go down a path somewhere, and you just want to have a quick chat to bounce some ideas, but you don't necessarily get the chance to do that. This collaboration has pushed how I think about things but also about collaborating in a virtual space. We have been able to achieve a genuine dialogue, virtually.

SW It's been much more like a relay race. The baton is handed on, perhaps to the next person to build on what the other person has started. It's more like one person is responding, and then the next responding to that.

You're not trying to hold onto the piece of work, as to how it has to be. You're a bit more open to people playing around with some things because there's more time, and I think that we have learned to do that more in this process. You know that everything someone else does means it's slowly edging forward to the best output.

Virtual jamming

DL The thing about working in the Unreal software is that it is an environment to collaborate inside. You can escape there, work together, smash things up, like rocks in a river. You can be completely instantaneous, try out ideas together, and then sometimes things can happen from that. It's like an escape into the work, a form of escapism that's different to any other projects I've worked on. We've managed to bounce ideas around, experiment. It's an inspiring place to walk into, it does feel like a kind of jam.

RS I was working on a new analogue modular synthesis system and this modular way of working seemed to really chime for me. Modular systems work on the flow and control of voltages often in unique ways, depending on how you set them up. This can result in some fairly random and unexpected results, just as in the Unreal software where the digital worlds partially take on a life of their own as you explore them. A large part of the thematic development of *Escaping Gravity* seemed to me to be about flows: flows of air, flows of collective memory connected to place, flows of people, information and power through colonialism and globalisation, so within the generation of sound there were clear parallels that I could jump off from. At the same time Roger was



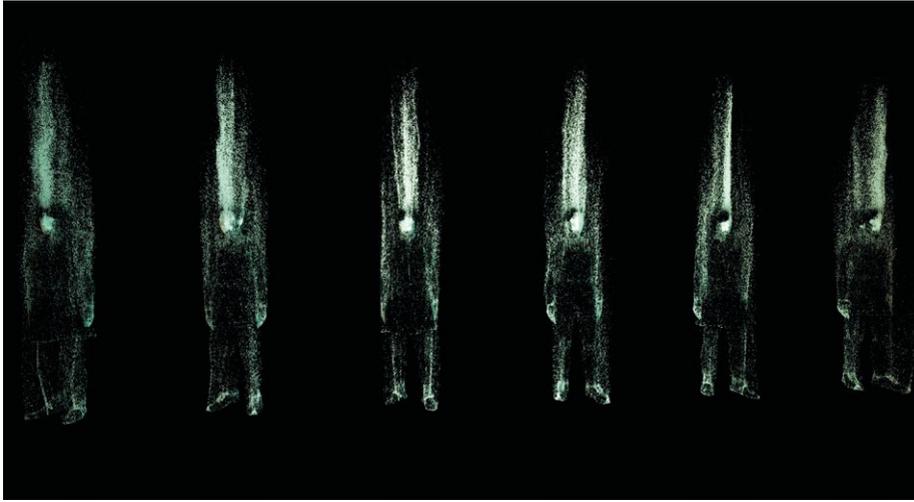
Lab at The Higgins
Bedford, May 2021.
Rob Strachan
(foreground) and
Roger Illingworth
(background).
Photo: Andy Willsher.

developing a series of instruments built from historic sound recordings relating to airships and we knew a combination of these could be conceptually and sonically strong.

MS The performing of the work is really important too. Because it's created in this way, through Unreal, it means that it's not static, it can change based on how we perform it, non-linear. I think this is really interesting. The work is in its infancy and when we start to interact with it, I hope it will lead to further interaction and experimentation.

Accelerated changes, already begun

DL These developments are game changers. I think within five years the way that we think about what it is to be an artist, collaborator or audience member will be completely different. A connected, genuine embodied experience with someone on the other side of the world will be quite normal. Already we have virtual performances where people are in MoCap (motion capture) suits in a virtual space but they are there, live, and you're there too, as a representation of yourself. These things don't feel weird anymore. It's shifting and it's becoming easier for everyone to use.



Airship Dreams: Escaping Gravity, 2021.
Mike Stubbs with Roland Denning, Roger Illingworth, Dave Lynch, Rob Strachan, Sam Wiehl.

It does seem that the impact of the pandemic and technology advances are going to converge into something that's completely different. Whether or not it's good we'll have to see. Whether or not it brings us closer together or takes us further apart, I think it'll do both of those things. I think the way we process stories and emotions will change too. How will we even process what the 'self' is in this new, virtual world?

Roland Denning is a filmmaker and writer based in London. Roger Illingworth works as a composer, songwriter, teacher and community musician, with a focus on community composition, improvisation and electronic music. Dave Lynch is an artist and inventor. He is Artist in Residence at the Centre for Immersive Technologies, University of Leeds. Mike Stubbs is an artist, filmmaker and curator and lead artist for the Airship Dreams commission. Rob Strachan is a sound artist, musician and a senior lecturer in the School of Music at Liverpool University. Sam Wiehl is an artist and live event designer. His work explores immersive audience experiences.

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