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DRONES

The Brilliant, the Bad
and the Beautiful

Andy Miah

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The Brilliant, the Bad and
the Beautiful

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INVESTOR IN PEOPLE

To Ethan, aim high.

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PREFACE

The inspiration for this book began in the Autumn of 2013, with a dialogue between myself, the experimental arts festival Abandon Normal Devices and the artist technology collective, Marshmallow Laser Feast. Together, we received funding from the UK's National Endowment for Science, Technology and the Arts (NESTA) to explore the creative potential of drones.

The Nesta fund was interested in how digital R&D could be useful for arts organisations, either in designing products, making production efficiencies or creating new insights that could establish new forms of creative practice. Even beginning the project we were not sure which of these we would fulfil, but there was a strong desire to discover insights that could help arts producers figure out how to use drones within their programmes to create new, different and rich audience experiences.

In one of our first meetings, the title *Project Daedalus* came about, after a discussion about the myth of Icarus. In the context of drones, the story of Icarus was particularly prescient, as drones were, then, still highly experimental devices. We were conscious of the risks associated with flying objects in a modern society, both in terms of safety and in terms of the fragility of the technology, which might easily fail at the crucial point of production. We were also conscious of what Icarus has come to symbolise about the act of flight itself, symbolic of humanity's excessive hubris amid a failure

to appreciate the catastrophic consequences that often follow from excessive ambition. As such, we sought refuge in Icarus' father, Daedalus, to characterise the project's values. Daedalus was a craft maker, an artist even, and the creator of Icarus' wings. This was a suitable metaphor for the project, as our goal was to enable flight-based art experiences within the art sector. Yet, we were also informed by Daedalus' cautioning of his son, who told Icarus not to fly too high.

These tethered ambitions were an important operating premise for the project, but we needed to ensure that what we ended up with was much more effective at preventing injury or failure in art productions, than Daedalus was in influencing his son. We wanted to ascertain how we could give practical advice to artists and producers, while also ensuring that we were able to explore the creative limits of the technology. We also wanted to scrutinise the audience experience of such work – without falling into the typical technofetishism that often surrounds innovation. The project would be deeply embedded in the latest technological apparatus and yet we all wanted to interrogate this, question the conventional audiences and consumers of technology and challenge the typical narratives that surround such use. In this respect, the intellectual framework for our research and development was born out of a desire to strip away the technology and focus on the way in which narrative may operate differently through drones – how could they be used for new kinds of storytelling experience?

In the summer of 2014, I took a one-day drone flight course run by Andy Goodwin at Liverpool John Moores University and purchased a couple of micro-drones to practice flying, learn more about the capacity of drones to fly in a semi-autonomous manner, and get to grips with the regulations that surrounded such use. As the project started in October 2014, we were already beginning to see a tidal wave of drone designs and stories emerge in the press. It seemed like not a

week went by when there was not a new Kickstarter being launched, or a new headline related to drones. For both the UK and the USA, their principal regulatory authorities – the Civil Aviation Authority and the Federal Aviation Administration, respectively – were each in the process of discussing how best to regulate drones in civilian contexts, which expanded the intellectual frame around the project considerably.

Suddenly, drones were going mainstream and attracting considerable controversy. These developments expanded my interest in drones beyond the project, particularly since it quickly became apparent that producing drone art involved engaging a whole range of issues outside of the practice itself. There were uncertainties about what people could do legally with drones in society, or even what an arts organisation would have to do to ensure that a drone art production was made safe. There were also questions around the security of drones, the cultural meanings they have, the growing ease with which users could operate them and the manner in which their function was also changing, opening out their use to new kinds of demographic.

Something happened to the drone market in late 2014, which led to 2015 being written about as the year of the drone – at least, in terms of consumer technology – justified in part by the proliferation of highly powerful consumer platforms which gave birth to drone communities all over the world. Soon after, such organisations as the Society of Drone Journalists, the World Drone Convention and the New York City Drone Film Festival were established, along with major institutions with governance responsibilities that were trying to figure out society's response to the widespread proliferation of drones.

These happenings influenced how we thought about the utility of Project Daedalus. We had committed to coming up with a tool kit for drone artists, but how could a tool kit be useful in a context where there is constant change taking place

and where the volume of money invested in the industry's technological ecosystem far exceeded the project's resources? Over the following months, we became engaged with drone stakeholders across a range of sectors and began to set out a vision for what we needed to consider when thinking about how to get the most out of drones. By then, drones had become a topic of widespread public debate, in part due to the growing consumer market, and the expansion of ways in which drones could be used by civilians for filmmaking or scanning environments.

Central to our work was the collaboration between researchers, technologists and artists, which was the foundation for our inquiry. New modes of discovery are possible by embracing a range of disciplines to ask questions about a single subject. Across our project, the pursuit of producing drone art led us into conversations with the Civil Aviation Authority, Liberty UK, Drone Hackers, Drone Racers, the world of international sports media and much more. This book endeavours to do justice to this period of intense research and development around drone technology but it expands well beyond these years. It addresses some of the key questions we had about how drones could be utilised and the issues that the typical hobbyist might have about how to use them, what they can do and what's around the corner for the industry.

The central thread running through the book is the proposition that drones undertake acts of moral, social, and cultural significance, whether these are for good or bad, and the inquiry proceeds principally to explore this territory. In doing so, I ask questions about where drones are taking humanity and what it may be like to live in a world where there is, for instance, a drone highway in the sky, or drone police patrols, instead of ground constabulary.

In this respect, the book contributes to philosophical inquiries into technology, particularly where there are pressing societal needs to identify the moral import of such devices. In doing so, I am careful not to setup a false dichotomy between drones that one may describe as either unequivocally good or bad, since it is apparent that the goodness or badness of any particular application of technology is highly dependent on its context. For instance, a drone system designed to enhance civilian policing may also jeopardise the enjoyment of individual liberties. Alternatively, such applications may be directly derived from the same drone innovations that are used to undertake military interventions. As such, even where there may be societal value in the transfer of technology from one context to another, its worth may be tainted by the fact that it was designed for some other, more troubling use. Drone weapons may also further complicate the morality of conflict, for instance, by removing the combatant from the field of conflict. Here again, moral tensions exist, as one might also argue that such removal attends to a government's responsibility to minimise the potential for harm that its military personnel may encounter from engaging in conflicts, as Strawser (2010) argues.

It is for this reason that the book discusses the 'the brilliant, the bad and the beautiful' – itself a direct reference to Bijker's (1995) *On Bikes, Bakelike and Bulbs* – rather than set up absolute moral distinctions between contexts of application that are either good or bad. In the same way that Bijker's social history of technology clarifies how the world has been changed by such inventions, this book examines the moral implications of drone technologies while acknowledging that these evaluations are continual subject to re-interpretation. Like biology, technology evolves and adapts in new circumstances where different moral judgements may arise.

Analysing matters of design, development and application, the *first chapter* explains how drones have expanded as a vast consumer market in a very short space of time to become one of the defining technologies of the twenty-first century. It tells the story of the drone's emergence as an object of popular desire and how this reflects a certain kind of technotopian allure, which is found more widely in technological consumer culture.

Chapter 2 considers regulatory concerns around drone applications, discussing the greatest risks associated with their widespread use in civilian airspace. It also examines the development of regulations as evidence of an emerging moral pre-occupation with autonomous machines.

Chapter 3 examines the proposition that drone technologies are a force for good and explores a number of applications that have become prominent within this category. It investigates how drones are being used within a growing number of scientific research programmes and even in such pursuits as journalism to help us better understand the world around us. It focusses on what resides behind the desire to re-characterise drones as objects of desire – and products more generally – and as vehicles for positive social change.

In contrast, *Chapter 4* explores ways in which drones are used for morally contentious applications, while also scrutinising what it is about such uses that is uniquely troubling because they are drones. While our times are characterised by a surge of enthusiasm for the value of drones, so much of the innovation behind their development is achieved because of these destructive ambitions, and for many people, a drone's capacity to undermine human agency through destruction is the most salient anxiety that surrounds their use.

Chapter 5 examines the territory that fits into the realm of aesthetics – neither morally good nor bad, but a new kind of aesthetic sensibility. Framing the conversation around creative applications which encourage us to reflect on our

place in the world, this chapter examines the culture of creative drone innovation and artistic practice. In doing so, it considers how drones have been used in performance, spectacle and theatre.

In concluding, the book identifies the direction of travel for the civilian use of drones, providing a glimpse into some novel applications, trends in consumer interest, developments in new designs and questions that remain unanswered about how drones are regulated in society.

Throughout the book, I refer to a range of cultural texts, which speak to the symbolic connotations of drones, as entities that articulate the aspirations and anxieties of many science fiction writers and filmmakers over the twentieth century. Together, these hybrid narratives reveal why drones are so controversial, but also why they are so compelling, as they tell stories of humanity's future and invite us to consider how, like biology, technology also evolves. Moreover, I explore how humanity's conflicting emotions about these prospects is part of a wider technological anxiety that persists about flying robots and the growing incomprehension of artificially intelligent machines, which we are told may have their own volitions.

In closing, the book establishes that drones are morally significant machines, which are creating a culture of acceptance for artificially intelligent automation. There are few technologies which singularly define a period of time and even fewer which resonate with strong anxieties about technological change, but drones are among such examples. Over the last two decades, I have been intrigued by moments of technological discontinuity, an interest that was sparked by reading Ellul's (1964) *Technological Society* and later, Bijker's (1995) work, and this book seeks to attend to the drone's contribution to this trajectory.

My own inquiries into technology have often led me to consider the growing proximity of biological and digital

technologies, addressing how our comprehension of the human subject is disrupted by the integration of such technologies within our lives, an interest that persists across this book. Yet, drones are in a category of their own, in terms of what they symbolise about technology's future. Their otherworldliness generates deep anxieties about the age of the autonomous machine and what it might mean for humanity to usher in this new relationship with artifice.

Throughout, the book's focus is on drones that fly, but even this is a subset of the entire range of drones that exist. Today, drone designs encompass moving objects that can operate in the air, underwater and on land, even encompassing all three, or a combination of at least two. While there may be especially interesting discussions to be had within this wider range of vehicles, the focus on flying drones speaks to the mass popularisation of the drone industry. It is these kinds of drones that have created the mass interest in drone technology and which describe most of the consumer market. Nevertheless, there are remarkable drones available that mimic the swimming motion of marine life, in a similar way to how some drones mimic avian flight biomechanics. Such vehicles have huge potential to allow us to explore the hidden depths of the ocean, but it is the flying objects that are most fascinating from a societal and cultural perspective, at least, for now.

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