

# The Chief of the Air Staff's Reading List 2022



**Front cover image:**

The RAF Typhoon Display Team aircraft, BLACKJACK, piloted by Flt Lt Sainty flying over the iconic White Cliffs of southern British coastline ahead of the anniversary of the Battle of Britain.

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# Foreword

This reading list challenges us to think about the relevance and continued evolution of air and space power, as well as the partnerships and alliances essential to our common security and prosperity. The list explores the exponential advances in technology that are having a profound impact on the way we operate and the way we lead our lives, including space and cyberspace; the operationalisation of artificial intelligence; our ever-increasing reliance upon digital information and data; and the pervasive influence of information operations. I have also included titles that challenge us to think differently about the effectiveness of our decision-making, and the personal and societal influences on our judgement.

The 2022 list opens with Max Tegmark's *Life 3.0*, which asks: What does it mean to be human in the Age of Artificial Intelligence? It takes us to the heart of current thinking about the relationship between AI and the human race, the opportunities and the threats.

*We Are Bellingcat: An Intelligence Agency for the People* by Elliot Higgins tells the fascinating story of how a group of self-taught internet investigators managed to uncover some of the biggest crimes of our times. An essential read for those who are regular consumers of intelligence.

*Military Strategy in the Twenty-First Century* by Matlary and Johnson explores the challenges for NATO and its member states of developing effective military strategies in the face of significant technological and geopolitical challenges. An impressive array of expert contributions, from academics, senior military leaders and diplomatic professionals, offer evidence-based opinions on how to improve NATO's collective strategic focus.



In *Air Forces: The Next Generation*, Amit Gupta offers perspectives of the value of air power from a spectrum of leading nations, highlighting the drivers of air power development and the challenges involved.

The dynamics of the New Space Age are laid bare in *Space Barons* by Christian Davenport. This fascinating book highlights how space is no longer the domain of State actors, and where an elite of self-made billionaires are upending the status-quo to make space accessible to all.

In *Behold The Dark Gray Man*, Dr Katharine Campbell highlights the psychological impact of those military leaders who have to balance the responsibility of making important command decisions whilst also having to cope with the secret burden of post-traumatic stress disorder. A thought-provoking insight into the damage done by modern military conflict.

*Educating Air Forces* represents the first book to analyse the history of air power professionalisation through learning. Its authors, Wakelam, Varey and Sica, explore the

approaches to education taken by leading air forces, including their focus upon how best to prepare aviators to operate effectively across the spectrum from peace, through maintaining routine security to full-scale war.

*The Authority Gap* addresses the imbalance across genders in our professional and our private lives. Mary Ann Sieghart explores the range of actions which we can all take to address that imbalance.

Following their international best-sellers, *Thinking Fast and Slow*, and *Nudge*, Kahneman, Sibony and Sunstein explain the inherent flaws in human judgement which impact upon our decision-making, resulting from our bias and the distractions caused by our working and living environments. In *Noise*, they highlight how errors are made and, more importantly, the steps we can take to improve how we evaluate, make better decisions and solve problems more effectively.

Reflecting current strategic tensions, *The Russian Understanding of War* analyses the evolution of Russian military thinking, especially in times of crisis. Oscar Jonsson examines the historical evolution of Russian thinking, from the Bolshevik Revolution to recent interventions in Crimea and Eastern Ukraine. Of particular importance, this book details how the West might navigate the risk of inadvertent escalation.

I hope you will enjoy working your way through some or all of this year's list, particularly those titles you might otherwise not have tackled. I encourage you to continue to read and research even more widely, and to engage with your colleagues in discussing and debating these major contemporary issues, to help shape our Next Generation Royal Air Force.



**Air Chief Marshal Sir Mike Wigston** KCB CBE ADC  
The Chief of the Air Staff





## Message from the Director of Defence Studies (RAF)

I hope that you find the titles listed within this 2022 reading list to be both interesting and highly relevant to your professional and personal perspectives. Most of the books are available for loan from unit libraries and are also accessible in e-book format at the MOD Whitehall online library (<https://ebookcentral.proquest.com/auth/lib/mod/login.action>) – opening an account is straightforward, simply requiring your personal MOD email address to register. A wide range of publications are available for you to enjoy, with new titles being introduced throughout the year. If you discover a title which you feel is especially worthy of consideration for CAS' endorsement in his 2022-2023 list, then please get in touch with me at [CAS-ASDefenceStudies@mod.gov.uk](mailto:CAS-ASDefenceStudies@mod.gov.uk). For all serving regular and reservist RAF personnel and RAF civil servants, if your reading inspires you to take a greater interest in Air, Space and Cyber Power, International Relations and Emerging Technology, I would actively encourage you to consider applying for a Chief of the Air Staff's Fellowship. It may be one of the most rewarding and stimulating decisions that you will ever take.

Details of our CAS Fellowships can be found on the RAF Centre for Air Power Studies website at [www.raf.mod.uk/what-we-do/centre-for-air-and-space-power-studies/](http://www.raf.mod.uk/what-we-do/centre-for-air-and-space-power-studies/).



Group Captain Paul Sanger-Davies  
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## Contents

Life 3.0: Being Human in the Age of Artificial Intelligence (AI)	2
We Are Bellingcat: An Intelligence Agency for the People	5
Military Strategy in the Twenty-First Century: The Challenge for NATO	7
Air Forces: The Next Generation	9
The Space Barons, Elon Musk, Jeff Bezos, and the Quest to Colonize the Cosmos	11
Behold the Dark Gray Man	13
Educating Air Forces: Global Perspectives on Airpower Learning	16
The Authority Gap: Why women are still taken less seriously than men, and what we can do about it.	19
Noise: A Flaw in Human Judgement	21
The Russian Understanding of War: Blurring the Lines between War and Peace	23
The Chief of the Air Staff's Reading List 2020-21	25
The Chief of the Air Staff's Reading List 2019-20	26
The Chief of the Air Staff's Reading List 2018	27

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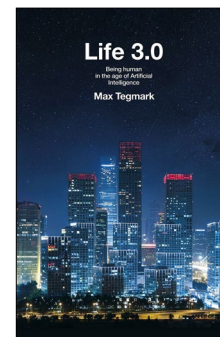
## Life 3.0: Being Human in the Age of Artificial Intelligence (AI)

By Max Tegmark

Publisher: Penguin Random House UK, 2018

ISBN: 978-0-141-98180-2, 364 pages

Reviewed by Flight Lieutenant Steve Lamb



You may not be interested in Artificial Intelligence, but Artificial Intelligence is interested in you. Even in its infancy, AI already decides what videos you see online, what adverts you're exposed to, and whether you should be granted a mortgage. The number of areas in which humans outperform machines is rapidly dwindling. Professions such as fighter pilot, doctor, and lawyer, previously considered immune from automation, are all now under threat, and far sooner than predicted. Leaders in every field are finding themselves unexpectedly responsible for deciding *how* AI should be integrated, either through the procurement of new technology or the creation of laws and procedures to govern its use. However, this nascent influence on our lives pales in comparison to what is on the horizon. The Holy Grail of AI development is Artificial *General* Intelligence (AGI). This is when a single machine intelligence surpasses human-level intelligence in all respects, from casual conversation to calculus, creative design to caregiving. This event, described by the futurist Ray Kurzweil as *The Singularity*, will be the most significant seismic shift in the evolution of life since the cognitive revolution. More important than asking what *will* happen, this book by Max Tegmark urges us to consider what we *want* to happen. Stephen Hawking called it the most important conversation of our time, and *Life 3.0*, is designed to give you the essential knowledge required to join that conversation.

Tegmark lays out a range of possible futures in extensive detail and insists we contemplate our preference, arguing that to stand idly by and ponder what path AGI will take is like sitting behind the wheel of your car wondering where it will go. He believes it would be unforgivable for us to stagger rudderless into the creation of AGI without a clear consensus on the desired outcome. At the time of writing, AI researchers have the key in the ignition, so we had better decide pretty sharpish where we want to go if we want to avoid arriving somewhere unpleasant or even dangerous. As Tegmark points out, "if we don't know what we want, we're unlikely to get it" (p. 160).

The book's title postulates that life can be classified into 3 developmental stages. It began as single-celled, purely instinctual organisms, capable of nothing more than survival and replication, and we are part of the second iteration: Life 2.0. Our upgraded version is capable of upgrading our own software by learning, but we are, for the most part, confined to a single physical form. Life 3.0 will arrive when a machine can alter both its software and its hardware; it will have a brain capable of learning and be smart enough to design a better brain for itself able to learn even faster, resulting in recursive self-improvement. If its goals are aligned with our own, it could be the last invention we ever need, ushering in a post-scarcity utopia. However, should our objectives conflict, it may also trigger the demise of our species and extinction of life as we know it. In the same way that elephants could never have



predicted humans would decimate their numbers just to use their tusks as status symbols, a super intelligent machine may decide to cull our own ranks for reasons we find equally inscrutable.

Max Tegmark is a Swedish-American physicist, cosmologist and professor at the Massachusetts Institute of Technology. He is one of the world's leading machine learning researchers. Tegmark has predicted that the advent of AGI will affect everything from our commerce to our culture, and is likely to transform the very fabric of who we are, in both mind and body. Grandiose claims like these may seem hyperbolic and the stuff of fantasy but the book patiently explains the solid science on which these claims are based. Even the most hardened sceptic will likely come away with a better understanding of the frightening reality of recursive self-improvement and exponential growth in AI. He does a wonderful job of making advanced and sometimes dry concepts accessible and engaging. The book is clearly written with the general public in mind and it succinctly dispels many of the more nonsensical beliefs and common misconceptions about AI. For example, Tegmark warns against anthropomorphising machine intelligence, claiming there is no scientific reason we should expect it to feel either gratitude or malevolence towards its creators: "the real risk with artificial general intelligence isn't malice but competence. A superintelligent AI will be extremely good at accomplishing its goals, and if those goals aren't aligned with ours, we're in trouble" (p. 260).

This book may not appeal to people seeking an in-depth technical précis of current AI developments: Tegmark ventures into discussion of cosmic proportions at almost every turn, which is liable to stretch the patience of even the most far-sighted reader. However, the book's strength lies in the crucial political and philosophical questions

it poses, questions that lie beyond the purview of most academic AI literature. From a military perspective, the rapid approach of autonomous weapons has stimulated much debate, but to grasp the full implications of AI, one must see it in a wider context. A whole section of *Life 3.0* looks at how AI may change the way weapons are developed and used, and again forces us to answer the question, what do we *want* to happen? This is the beauty of Tegmark's work: it is a call to action rather than just a perusal of possibilities. To influence the future course of AI in warfare, it is vital that military leaders understand the issues.

As AI weapons are developed and introduced, do we want to grant them autonomy in target selection and prosecution, deciding who lives and dies? On the face of it, this seems abhorrent and most right-minded people would always want the ultimate responsibility to be retained by a human. However, what about when the AI becomes smarter than the person in command, with situational awareness approaching omniscience, an infallible knowledge of the rules of engagement, and an almost mystic ability to extrapolate outcomes? Who then should we trust to make the big decisions: a tired, emotional, fallible mammal, or a clinical, indefatigable, super-intelligence that knows and shares our objectives? Given that Human Error is responsible for most fatal mistakes, would it be immoral to shun a more accurate system just to appease our distaste? Perhaps advanced AI should be pre-emptively banned from warfare altogether? As Tegmark points out, this disruptive technology is likely to favour smaller players rather than the current dominant nations as it provides an opportunity to upend the status quo (p. 117).

*Life 3.0* argues that many questions surrounding the use of AI fall into the realm of politics and philosophy, not design and engineering, and should therefore be decided

democratically. Do we want to create a libertarian utopia, a benevolent dictator, an omnipotent protector, or an enslaved god? Should we ban AI research now and forever more, opting to keep Pandora's box firmly shut? What does each of these scenarios entail? Most lay opinions are coloured by ridiculous depictions of machine uprisings like the Terminator. Tegmark's *Life 3.0* seeks to remedy this pervading general ignorance of both the threat and the possible benefits. Given the magnitude of the likely consequences, discussion of AI development ought to be near the top of our political agenda, alongside climate change and biodiversity collapse, yet it barely features in the public discourse. There is no one set outcome for the advent of AI, only a broad spectrum of possibilities. If, as a species, we are organised enough to agree a collective future goal to strive for, then that choice may be the most important decision in human history.

## We Are Bellingcat: An Intelligence Agency for the People

By Eliot Higgins

Publisher: Bloomsbury, 2021

ISBN: 978-1-5266-1775-61, 255 pages

Reviewed by Wing Commander Paul Withers

In the aftermath of the shooting down of Malaysian Airlines Flight MH-17 over eastern Ukraine in 2014, the world attempted to make sense of what had happened and who was responsible. Confusion was interlaced with deliberate disinformation, and amongst those piecing together the evidence was a group of open-source investigators known as Bellingcat. This excellent book shows the importance of open-source techniques as a means of deriving veracity amongst a flood of falsehoods, but also offers the reader a fascinating insight into wider information warfare.

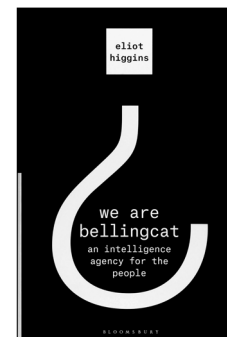
Bellingcat has propelled the author, Eliot Higgins, from being a bored office administrator, college dropout and online gamer, to being a highly influential open-source investigation specialist and expert witness. In addition to chairing the Bellingcat executive board, Higgins has held positions as a research fellow at the University of California, Berkley and as a member of the International Criminal Court's technical advisory board.

The book begins with Higgin's personal journey in online verification which started in August 2011, when posting a comment to newspaper blog. After linking to footage of rebels purportedly occupying the Libyan town of Brega, Higgins was challenged by another commentator who argued an important point: the footage could have been taken anywhere. Higgins set to work sketching a map of the footage and then trying to meticulously match every

visible feature with Google Maps. In doing so, he produced his first geolocation, something that later became a foundation of the Bellingcat method.

This early success led Higgins to create his own blog and his focus became fixed on attributing attacks on civilians in the Syrian Civil War, leading him to become a self-taught weapons expert. As the conflict in Syria escalated, getting authoritative independent news became more difficult. However, hundreds of hours of uploaded amateur video emerged from the conflict, material that was able to paint a picture, but lacked verification. Surely nobody had the time or inclination to trawl through this tsunami of online content? Higgins and a growing community of volunteers did, and their results have been quite remarkable.

Higgins describes how his loose network of collaborators grew to the point where he was able to crowdfund a new online platform, invite others to join, and set the standards for open-source research by publishing a set of 'how to' guides. The platform set itself the motto 'identify, verify, amplify': identify issues, verify all evidence without speculation, and amplify what they learned, whilst also amplifying the field of open-source investigation through education. The group's name, Bellingcat was derived from Aesop's fable, *Belling the Cat*, where a group of mice discussed fixing a bell to a cat to warn of the predator's approach, concluding with the question: Who will bell the cat?



Bellingcat was founded three days before the downing of MH-17 and was to play a pivotal role in verifying the movements of the Russian Buk missile launcher that shot it down. Crowd-sourced analysis helped identify the movements of the launcher prior to and after launching its missile. Painstaking research found numerous social media posts that showed the Buk; each image and video was geolocated and the time of day was derived from the length of shadows. Small identifying marks on the vehicle were used to 'fingerprint' it and establish a timeline of its movements before and after the shooting. The community effort allowed Bellingcat to turn individual snippets of evidence into proof that made a crucial contribution to the international investigation. The MH-17 investigation was followed by numerous other successful group projects: positively identifying the Russian GRU operatives responsible for the poisoning of Sergei and Julia Skripal in Salisbury; countering far-right extremism in the US; cataloguing events during the civil war in Yemen; and proving the use of chemical weapons in Syria, among many others. One measure of Bellingcat's success is that it has caught the attention of authoritarian states who see Bellingcat as a threat and have accused it of representing various Western intelligence agencies.

The author also looks to the future and notes that contrary to popular myth, something posted on the Internet is not necessarily there in perpetuity, noting that "the online world seems both enduring and ephemeral" (p. 197). The book highlights a dilemma in that the pressure on social media platforms to remove violent and extremist content is at odds with the need to preserve the evidential record for future judicial and historical analysis. In the future historians are likely to spend less time in physical archives and more time analysing online content; this book offers excellent insight into how they might determine historic fact from manipulation. The value of *We Are Bellingcat* is not just in highlighting the importance

of Bellingcat's findings, but also in educating us on its methods and techniques of verification.

*We are Bellingcat* should be read by military professionals of all specialisations, but particularly those who are regular consumers of intelligence. This fascinating and very readable book clearly makes the case for the importance of open-sources and describes a reversal in the primacy of secret intelligence, traditionally the preserve of states, towards open-source intelligence, the domain of the masses. It will also be of great interest to academics researching information warfare and to those with more general interest in recent conflict. It reinforces the need for all of us to challenge and critically analyse what we see online.

A growing body of literature is emerging expounding the societal threats of disinformation, in both the online and offline worlds, but few offer a solution to what has become one of the 21st Century's most insidious threats. *We Are Bellingcat* offers a glimmer of hope that the truth is out there for those with the diligence and commitment to find it. Those with a dystopian outlook might argue that disinformation is a problem that cannot be fixed. However, Bellingcat does not accept "cyber-miserabilism" (p. 7) and believes it can make a difference by growing communities vested with the skills to provide us with objectively verified facts.



## **Military Strategy in the Twenty-First Century: The Challenge for NATO**

By Janne Haaland Matlary and Rob Johnson

Publisher: Hurst Publishers, 2020

ISBN: 978-1787383913, 757 pages

Reviewed by Flight Sergeant Lawrence Clark



“Military strategy has gone missing in action” (p. xvii). This quote from the preface of Janne Haaland Matlary and Rob Johnson’s collection of essays on the various strategic conundrums with which NATO must grapple, leaves the reader in no doubt of the message this book is trying to convey. The singular goal of the title, first published in 2020, is to revitalise engagement between policy makers and military thinkers about the purpose of military strategy and the utility of military force. To stimulate debate, the editors have included a range of articles which combine to present some key strategic themes to the reader; none of which should be alien to those with an interest in current military affairs.

The first theme is the current strategic situation facing NATO: revisionist Russia, the rising global power of China, and the challenges faced by the West from a plethora of threats below the threshold of war. The second theme considers how to settle the ever-expanding range of strategic threats that NATO currently faces which are more varied than the single unifying purpose on which NATO was originally founded. The third and last theme focusses on how, with correct political involvement and understanding of the risk both militarily and politically, military force can achieve strategic ends. This last subject really morphs into one of the key findings of the book, which is that “military strategy suffers from a general lack of political direction: politicians who shy away from taking responsibility for

their obligation to specify the ends for which they use force are a common occurrence” (p. 4).

The book is a collaborative effort and includes significant support from the Norwegian MOD. The authors include some of Europe and America’s finest military and civilian academics, each of whom use their extensive experience in their own respective fields to contribute an essay to one of three parts of the book. Part one, titled Politics and Military Strategy, dissects the conceptual issues surrounding military strategy in general and examines the tensions and frictions that exist between member states and the importance of the transatlantic link. Part two, The Parameters of Military Strategy, examines which kind of military strategies are really relevant for NATO in the current security context; and part three, Military Strategy in NATO States, analyses the strategies of several key members of the Alliance.

The essays contain several topics and conclusions that other works examining contemporary military strategy cover, such as Kilcullen’s *The Dragons and the Snakes*, McFate’s *Goliath*, Strachan’s *The Direction of War* and Simpson’s *War from the Ground Up*. However, each essay is succinct and thought provoking, and the authors pull no punches with empirical, evidence-based arguments to back up their propositions and recommendations. For example, in part one Janne Haaland Matlary presents a rather scathing assessment of European nations’ ability to

use the military instrument effectively, claiming a lack of will to take political risk means European leaders cannot or will not use the military to deter or coerce, essential tenets of military strategy when facing risk prone actors such as Russia. Matlary backs her argument with examples of political leaders contributing forces to NATO missions in a risk averse manner, keen to be seen as a 'good ally' but, trying to avoid the homeland political ramifications of using force to achieve a political goal. A familiar situation for UK defence practitioners.

In part two, *The Parameters of Military Strategy*, Jefferey H Michaels examines NATO's nuclear strategy, and it is the focus on the decision-making process when considering the use of nuclear weapons that makes this contribution to the book particularly interesting. Michaels uses historical examples from the Cold War to argue that the employment of nuclear weapons seems less likely today within the context of an expanded NATO alliance, with no clear decision-making structure or process, than during the Cold War. This naturally leads one to question the utility of nuclear deterrence within the construct of NATO, and to ponder the utility of scenario-based wargames that assume that nuclear use has been authorised.

Part three, *Military Strategy in NATO States*, includes a proposal for the UK's future military strategy. Tim Benbow highlights the continuing theme of UK military strategy being somewhat hamstrung by the friction between ambition and funding but goes on to argue that to maximise the strategic gains the UK Government can leverage from its armed forces, there must be a degree of interdependence with allies which has led the UK to renew its focus on NATO especially in the aftermath of 'Brexit'. Benbow also proposes an interesting 'concentric circles' approach to UK military strategy, with decreasing levels of military engagement the further one looks from Europe. He argues that the UK is best placed to provide a maritime

focussed military approach in the North Atlantic and European maritime flanks of NATO, with "significant, albeit secondary effort devoted to the Mediterranean, Gulf and Indian Ocean" (p. 367). The Indo-Pacific region is best left to a predominantly diplomatic non-military approach as UK forces deployed to this region would do little to alter or affect the balance of hard power. This approach could fit well within the parameters set out by the recent *Integrated Operating Concept 2025* and might allow all branches of the UK's armed forces to contribute to a joined-up military strategy backed by the comparative advantage the UK holds in the maritime domain.

While some essays in the book may cover previously trodden ground, others serve to highlight some niche, yet vital areas for consideration, for example the military strategy of Turkey, a key NATO ally, but controversial actor. The essays combine, with sufficient breadth, around the themes used throughout the book to serve as multiple points of departure for serious debate, and to provide plenty of further areas for research by its readers. In this regard the book adds significant value to the field of military strategy and clearly achieves its stated purpose. The contributors to this book, all experts in their field and highly respected academic, military and diplomatic professionals, do not stop short of offering sometimes controversial, but empirical and evidence-based opinions. This is an essential ingredient when the purpose of the publication is to spark debate among the wider political and military community. For that reason, I would certainly recommend this book to be read by all members of the military profession, particularly those who are attending professional development courses. However, it will be of greatest value to the military and civilian practitioners who advise politicians or contribute to the areas where political and military spheres overlap.

## Air Forces: The Next Generation

Edited by Amit Gupta

Publisher: Howgate Publishing Limited, 2020

ISBN: 978-1-912440-08-05, 392 pages

Reviewed by Colonel John Andreas Olsen

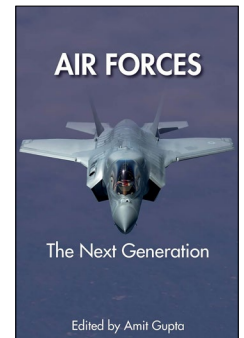
*Air Forces: The Next Generation*, edited by Amit Gupta, is an impressive and important book about what it means to be a nation that appreciates the value of air power and understands its effective application. The book is impressive in scale and scope because it deals with 14 different air forces on five continents. The book covers the status and prospects of aerospace power in Australia, France, Germany, Italy, the United Kingdom and the United States as well as the non-Western countries of Brazil, China, India, Indonesia, Kenya, Pakistan, Russia and Taiwan (the Republic of China). This broad scope gives the reader a unique opportunity to compare and contrast the strengths, limitations and potential of air forces worldwide.

The expert authors demonstrate that the development of small, medium and large-scale air forces – as the lead element of a nation's air power – depends just as much on geography, political orientation, history and culture as it does on budgetary pressures and industrial-technological sophistication. The book makes its first major contribution to the current literature on air power through the authors' ability to put the various air forces in their proper political-military and social-economic contexts. The comprehensiveness of each case study constitutes the second contribution: rather than focus only on aircraft, air defence systems and modernisation plans, the studies analyse security policy and defence documents, military reforms and force structures as well as educational systems and in some cases operational

experiences. The third contribution results from the way the authors address the role of national air power in ensuring sovereignty and territorial integrity against state and non-state actors, and show how air forces can offer a range of options to civilian authorities in humanitarian crises, whether caused by nature or humans. The authors also demonstrate the political dimensions of the global defence industry, and how the current arms market reflects perceived friends and foes and thus often results in strange bedfellows and marriages of convenience.

While each chapter is well worth reading in its own right, it is the combination of the case studies that creates the real 'added value'. Some chapters inevitably have a more scholarly focus and present more profound assessments than others, but all the authors meet a very high standard: the chapters are well structured, researched, focused and referenced.

This is an important book because over the last three decades air power has come to play an increasing role in national defence, international relations and warfare even though national decision makers and even military professionals may not fully understand its utility and special characteristics. Thus, it is very tempting for leaders to employ air power in a limited fashion, as it offers the prospect of success without large-scale destruction and loss of lives; they may view it as producing instant results without requiring significant political commitment.



This outcome indicates that, as Gregory Alegi observes in his chapter on the Italian Air Force, air power runs the risk of falling victim to its own success.

The case studies on Russia, China, India and Pakistan all show how air power is progressively becoming recognised as an independent and strategic component of national security, not merely an instrument to support the ground commander's scheme of manoeuvre. These four countries are moving from a ground-centric doctrine to one of appreciating that aerospace power can function as the lead or subordinate element, depending on the political context of the given situation.

In his chapter on the United States Air Force, Ron Gurantz makes a very convincing argument that 'air power interventionism' even in non-military contexts will remain a valid concept with the return of great power conflict. Amit Gupta echoes this: "in the near and medium term, one of the IAF's [Indian Air Force's] most successful missions, and the one that will increase India's soft power, is its ability to contribute to multinational humanitarian missions". The use of air power will remain politicians' first response to crisis and conflict both at home and abroad.

*Air Forces: The Next Generation* highlights that an effective and future-oriented air force is one that maintains a proper balance among technology, organisation and concepts. At the moment, the most advanced air forces are developing and/or purchasing fifth-generation aircraft without thinking enough about fifth-generation organisation (structure, recruitment, education, training, etc.) and fifth-generation doctrine. In the new security environment – characterised by nuclear, conventional and various types of hybrid challenges – the intellectual component of air power is just as important as the physical. Peter W. Gray emphasises how far the Royal Air Force has come in "fostering the intellectual component

of fighting power" and Pete Wodding accentuates how the Royal Australian Air Force encourages creative and lateral thinking through 'Plan Jericho'. James R. Beldon sums up this important message in his excellent concluding chapter: "Air forces, both large and small, can learn much from the Royal Australian's Air Force approach – not least the power that intellect, reason, and strategy can still exert in an era dominated by politics and budgetary competition".

I recommend this book to all air professionals, but especially to the younger generation, as it offers unique perspectives on the status and development of a representative selection of air forces. I also recommend it to national decision makers, students of international relations and personnel of all military services, as air power is not relevant merely to those directly involved in its application but should be of interest to all who are concerned with peace and security.

As this book makes clear, we are entering a period of significant change: a new strategic environment that includes a new form of arms race in both aircraft and missiles drawing on the capabilities produced by the Fourth Industrial Revolution. The role of air power will increase rather than diminish with the continuing tectonic shift in global geopolitics. Knowledge and insight will be our most important asset. The greatest challenge in shaping our air forces lies in the contest of ideas, because that contest shapes war-winning strategies, concepts and force structures. Any air force that is willing to invest in the intellectual capital of its personnel will do well; any air force that also promotes development of air-mindedness throughout its nation will do better still.



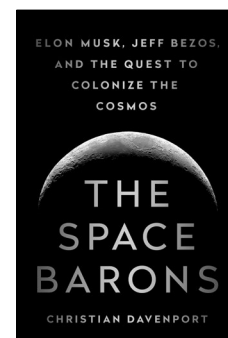
## The Space Barons, Elon Musk, Jeff Bezos, and the Quest to Colonize the Cosmos

By Christian Davenport

Publisher: Public Affairs, 2018

ISBN: 978-1-5417-7416-2, 275 pages

Reviewed by Air Vice-Marshal Harv Smyth



This book is a must for those that wish to understand the dynamics that underpin the New Space Age. Christian Davenport, *The Washington Post's* lead journalist for the space and defence industries, intimately lays out a future where space is no longer purely the domain of State nations, but instead one where self-made billionaires, driven by ego, rivalry, altruism, entrepreneurialism and a quest to be bold, are upending the status quo, revolutionising technology development, driving down costs, making space accessible to all, and striving to not only send humans back to the Moon, but also to Mars, and beyond.

Unlike most books about space, Davenport's exposé is not rife with impenetrable technical detail (however, there are some short excursions and exceptional descriptions of rocket technology in Chapters 8 and 10) but instead, he concentrates on the human element, exploring what drives each new 'Space Baron'. His razor-sharp insights, and unrivalled access to Elon Musk (*SpaceX, Tesla, PayPal*), Jeff Bezos (*Blue Origin, Amazon*), Richard Branson (*Virgin*) and Paul Allen (*Microsoft*) presents a canvass upon which he articulately describes what motivates each of the *Space Barons*, in particular Musk and Bezos who dominate most of the book.

Musk, the impatient, brash, South African billionaire, takes a "head down, plow [*sic*] the line' approach" (p. 49), and is happy to meet his opponents head-on, especially if they

are part of what he deems the entrenched establishment (US Government and NASA to name but two). By the end of 2003, when it was apparent that Musk's new company *SpaceX* wasn't being taken as seriously as he had hoped, he transported his seven-storey Falcon-One rocket to Washington DC, and parked it on Independence Avenue right in front of the offices of the Federal Aviation Authority during the centenary celebrations of the Wright brothers' first powered flight (p. 42). This forthright, public-facing approach has been the consistent hallmark of *SpaceX*, somewhat propelling Musk to rockstar fame amongst the broader space fraternity, solidified even more by the fact that he has gladly taken his potential future employers, such as the US Air Force, to court, and won, when he felt *SpaceX* wasn't getting a fair shot at competing for major contracts. Fast forward to today, and this once 'little start-up company' is now at the forefront of commercialising space, outcompeting the hitherto hegemony of Lockheed Martin and Boeing by winning the contracts to deliver cargo and astronauts to the International Space Station, and moving ever closer to Musk's dream of making humans a multi-planetary species (p. 123), by navigating to Mars via his *Starship* programme.

Meanwhile, Jeff Bezos presents the antithesis: where Musk is the hare, Bezos prides himself and his *Blue Origin* company in embracing the role of the tortoise, with both characters playing out a modern version of Aesop's fable (p. 57). Operating behind a veil of secrecy in a vast area

of west Texas which he purchased clandestinely, Bezos takes a more methodical approach to achieve his goals, which ostensibly boil down to protecting the Earth by conducting all 'industrially dirty activity' in space, therefore allaying climate change and affording our planet the opportunity to transform into a pseudo-National Park: this is described in detail as "The Great Inversion" throughout Chapter 15. Bezos revels in his plodding approach, overtly choosing two turtles staring up to space as *Blue Origin's* coat of arms whilst embracing the ethos of US Navy SEAL training: "slow is smooth, and smooth is fast" (p. 56). Despite the stark differences in approach, the book clearly highlights that each company, *SpaceX* and *Blue Origin*, continue to make startling progress in terms of redefining the commercial space market, specifically in terms of reusable equipment, to levels of safety that allow human spaceflight at a fraction of the cost previously endured.

Beyond the dissection of other personalities, such as UK's Sir Richard Branson in Chapter 6's "Screw It, Let's Do it", the book also presents some superb examples of how to manage risk, and conduct capability development and delivery at pace whilst keeping costs low. Perhaps it's here that we in UK Defence, and in particular the nascent UK Space Command, can glean lessons which will help inform a new, forward-leaning approach to the delivery of UK's more ambitious Defence Space Programme, as portrayed in the 2021 Integrated Review and Defence Command Paper. Chapter 9 is an insightful read, laying out how *SpaceX* possesses an instinctive contrarian bent that questions everything – the price, the rules, the old ways of doing things, leading to an obsession with finding ways to do things cheaply and more efficiently. If the 'old guard' at NASA are the adults, *SpaceX* plays the role of the child, constantly curious, always asking why (p. 150). In today's fast-paced, digital world, there is much to learn from this book in terms of a renewed approach to capability acquisition and technology development, if indeed we in

UK Defence are to stay ahead of our potential adversaries without pricing ourselves out of the market.

Davenport's book leaves us in no doubt that the Space Race has been resurrected, but this time there is no Sputnik, there is no Apollo Programme, but instead a pair of billionaires with vastly different styles, both audacious and ambitious in equal measure, fuelled by rivalry that oftentimes plays out in the Twittersphere or publicly tense legal battles: both rivals on a common quest to colonise the Cosmos, one blazing forward, kicking up dust as the impatient hare, the other plodding steadily behind as the tortoise, slow is smooth and smooth is fast, in a race that has only just properly begun, but one that will change the face of humankind forever.

In January 2017, the last man to walk on the Moon, Gene Cernan (Apollo 17), died. As he departed the lunar surface he said, "we leave as we came, and God willing we shall return, with peace and hope for all mankind". Cernan predicted that such a return to the Moon would be followed shortly thereafter by another giant leap, this time onwards to Mars (p. 275). It would appear that the *Space Barons* will ensure that Cernan's prophecy is fulfilled.

## Behold the Dark Gray Man

By Katharine Campbell

Publisher: Biteback Publishing Ltd, 2021

ISBN: 978-1785905971, 512 pages

Reviewed by Group Captain James Beldon

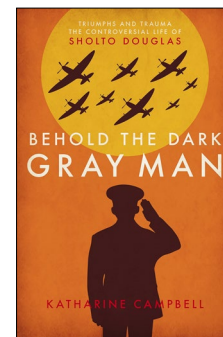
It would be forgivable for readers to question the even-handedness of a biography written by so close a relative of Marshal of the Royal Air Force Lord Douglas of Kirtleside (ubiquitously known as Sholto) as his daughter, Dr Katharine Campbell; their fears are unwarranted. The author maintains commendable objectivity throughout this excellent book, reflecting the scientific discipline she learnt and applied throughout her own career as an accomplished neuroscientist. Where Campbell sides with Sholto's version of history, she does so based on the primary sources that she uncovered and scrutinised with the rigour of a seasoned professional historian.

All the controversies associated with Sholto's career are addressed unhesitatingly, not least his role in the Battle of Britain 'Big Wing' row, which to a degree was fomented by his former aide, Robert Wright, who in the 1960s collaborated on the first volume, and co-wrote the second volume, of Sholto's autobiography (*Years of Combat* and *Years of Command* respectively). Arguments over delayed payments, stemming in part from Sholto's tardiness in returning manuscripts to Wright (mostly owing to Sholto's rapidly failing physical and mental health), clearly strained their relationship to breaking point, and it is therefore not surprising that Wright's subsequent biography of Air Chief Marshal Lord Dowding (for whom he also served as an aide prior to his replacement by Sholto as Fighter Command's Air Officer Commanding-in-Chief), which was published

shortly before Sholto's death in 1969, set about tarnishing Sholto's reputation.

There is, therefore, a degree of setting the record straight in this biography, which is articulately achieved by an author whose analysis and written precision belie the fact that it is her first major literary venture. She finds the perfect form of expression to convey her analysis of the complex and competing current and historical concepts surrounding the issue of Post-Traumatic Stress Disorder (PTSD), in which she breaks new ground: indeed, she has made a monumental contribution in moving the common PTSD discourse beyond the foot-soldier-centric stereotype to the cumulative effects of chronic stress, fatigue and fear over decades, on the senior commander. In this regard, Sholto provides, perhaps, a peerless example: ripped out of the 'creeper-covered quads' of Lincoln College Oxford by the tide of war in 1914 to serve firstly as a Royal Artillery Officer, then successively as a Royal Flying Corps observer, pilot and scout squadron commander (repeatedly), he went on to serve in a succession of high commands in the Second World War, and later – most wearily – as the Military Governor of the British Zone in post-War Germany – a poisoned chalice of which his predecessor, Field Marshal Montgomery, was clearly only too pleased to relieve himself.

Where the author's personal reflections are recounted, they provide invaluable personal insight into the



nightmarish mental world into which her father descended in his dotage, when she herself was just a young girl. The author illuminates in appropriately garish light the nocturnal torture which she watched her father endure, and which frightened her (no wonder she re-attributes the ancient Douglas Clan's 'Dark Gray Man' sobriquet to him), as, unaware of the presence of others, he repeatedly re-enacted the harrowing role that he had played as Military Governor in confirming death sentences on a wide variety of offenders, ranging from sickeningly despicable Nazi war criminals, to pitiable brutalised displaced people who had either looted, been found in possession of small-arms (a capital offence in post-War Germany), or who had exacted bloody revenge on their erstwhile Nazi tormentors. In this context, as Sholto's daughter, Katharine Campbell provides a viewpoint that a more detached biographer would find impossible to achieve: one such instance is her observation that Sholto always signed his death penalty decisions as 'Sholto Douglas' rather than using his more customary abbreviated initials, rank or position, lending credence to Sholto's recorded view that he was being asked to exercise his personal judgement as a human being – it is one of many touching highlights in a book that manages to synthesise official facts with humanity throughout, generating an engrossing, persuasive and compelling read.

The book also astonishes in the complex array of relationships – both official and the distinctly unofficial – that Sholto (and, incidentally, his rather scandalous father) forged. There is no stinting from the opprobrium Sholto attracted for certain aspects of his personal life, albeit the 'venomous' attacks covertly made on him by Air Chief Marshal Sir Wilfrid Freeman to the then Chief of the Air Staff, Portal, would undoubtedly have confounded Sholto's appreciation of a colleague he considered to be a close friend; indeed, the author movingly conveys the shock she felt herself on uncovering Freeman's betrayal.

It is not possible definitively to diagnose Sholto with PTSD more than 50 years after his death, but on the evidence the author has unearthed and mobilised, a convincing case is made that his mental and physical decline in his later years stemmed from the multiple traumas he encountered from childhood onwards. His progress to the very highest rank of the Royal Air Force – a rare achievement for an officer who had not served as Chief of the Air Staff (Marshal of the Royal Air Force Sir Arthur 'Bomber' Harris being the only other example) – is all the more remarkable for having overcome such obstacles. But, as the author concedes, it is extremely difficult (and, in the case of a man who died so long ago, impossible) to untangle 'cause and effect'. Hence, one cannot ascribe absolute certainty to the author's contention that Sholto's mental and physical disintegration were due to accumulated PTSD – or that, instead, his physical and mental decline were intertwined in other ways, which is not unlikely given that Sholto lived to the age of 75 – well beyond the life expectancy of a man born in 1893 (who would be lucky to reach the age of 50), and obviously much less than that if serving, as Sholto did, in the combat arms of the British Armed Forces in both World Wars! Necessarily, therefore, there is a degree of conjecture in reaching a definitive post-mortem diagnosis of PTSD that accounted in the main part for his decline, albeit the author succeeds in making the case that he must have been a sufferer of the condition to a lesser or greater extent. Consequently, this book deservedly sits in the 'biography' category of the book shop rather than in a scientific journal, but it loses no academic force as a result, and will deservedly reach a much greater readership as a consequence.

From a 21st Century vantage point, it is impossible – indeed it would be ignorant – to imagine the strain under which Sholto toiled for so many decades. In Douglas' case, it is reasonable to conclude that the well of personal resilience on which he was forced to over-draw in two



World Wars and in post-War Germany, exacted a price that was cruelly extracted from his soul in later life. He did not die in service, but the author persuasively argues that his service contributed to his painful demise. Sholto's story reinforces the increasingly repeated mantra oft heard in the Remembrance season that in remembering the dead, we should not forget the living – for they too have paid a price.

Katharine Campbell has not only successfully breathed colour, scientific rigour and humanity into this overdue appraisal of her father's life, triumphs and ultimate disintegration, but has also highlighted the psychological dangers that confront all those who reach and exercise higher command. To that extent, this outstanding book is more than a biography of a historical figure: through exploring Sholto Douglas' life in such a ground-breaking way, this book contains valuable warnings and lessons for commanders for all time. It is therefore highly recommended reading for today's and tomorrow's commanders as well as the student of Royal Air Force history.

## **Educating Air Forces: Global Perspectives on Airpower Learning**

Edited by Randall Wakelam, David Varey and Emanuele Sica

Publisher: The University Press of Kentucky, 2020

ISBN: 978-0813180267, 254 pages

Reviewed by Air Vice-Marshal (Ret'd) Prof Tony Mason

This collection of essays, edited by Randall Wakelam, David Varey and Emanuel Sica reports the proceedings of a symposium on the subject organised by the Canadian Armed Forces in 2016. Although primarily addressing education and training in air forces, it contains a breadth and depth of analysis which makes it relevant to armed forces whatever the colour of their uniform.

The essays cover the evolution of education and training in air forces from their earliest days in World War 1 (WW1) to the uncertainties of the post-Cold War period. Their framework is clearly outlined in Wakelam's introduction and supported by comprehensive bibliographies.

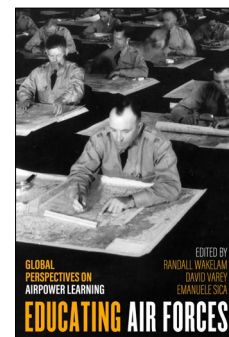
While some of the contributions largely concentrate on the Canadian experience, others offer an international perspective which together give the volume a unique value in the liturgy of military education. Among the latter are the papers by Peter Gray, James Beldon, James Corum, Richard Goette and John Farquar.

Peter Gray traces the association of the birth of the independent RAF with the genesis of air power thinking in the UK and USA. He emphasises the influence of Trenchard and a close but influential group of senior Army and Royal Navy officers who realised the importance of creating a Royal Air Force Staff College which would become in his words, "the cradle of our brain". Gray explains how it was very easy for doctrine to slip into dogma, especially in the

face of inter-Service rivalry and jealousies, in an age of tightly constrained resources and governments which had difficulty in identifying or even conceding the presence of threats. His underlying thesis, that independence and agility of military thought need more than sympathetic institutions is timeless.

In his study of the Luftwaffe between the first and second world war, James Corum explains how the most intelligent, imaginative and flexible of air power exponents were overwhelmed and defeated by forces beyond their control. His examples should remind all policy makers that no military power can succeed without adequate resources against a vastly superior opponent.

Richard Goette concentrates on the professional military education of the Canadian Air Force in the early Cold War years. His identification of three components of military power: conceptual, moral and physical is a useful paradigm for the examination of air power by any country. He emphasises the importance of the Conceptual component in air force education in developing and enabling the "officers' intellectual agility to ensure the proper generation and application of air power". He later explains how RCAF initiatives sought to enhance such agility by thinking beyond tactical levels in the cockpit to develop the understanding and ability to deal with more complex operational issues. Elsewhere in this compendium it becomes clear that despite the RCAF initiatives described



by Dr Goette, subsequent Canadian Joint and Combined Service reorganisations illustrated that air power concepts would demand consistent strong defence in the face of competing pressures from naval and army sources.

John Farquar's opening paragraph sets out the fundamental questions which challenge any armed service in inspiring and fostering education. It should be copied and set in stone not just in an education or training establishment but in the daily eyeline of every Commander in Chief or Chief of Staff. Specifically: how does a military organisation inspire learning and foster education? How does an air force build a professional education system? How does it generate intellectual capability? What is the correct balance between proven doctrine and emerging possibilities? How does a military academy inculcate traditional values of duty, honour and country while not stifling creativity, innovation and thinking?

In support of his position, Professor Farquar cites Richard Preston, Sam Huntingdon, Peter Rosen and Melvin Kranzberg to good effect. He traces the earlier contributions of Billy Mitchell, Mason Patrick, often in the face of institutional opposition, up to the Cold War influence of Hap Arnold, Carl Spaatz, Muir Fairchild and General Eisenhower himself. Even with such support, it took 70 years for the USAF to establish its independence. In a sobering closing paragraph, Professor Farquar observes: "In a democracy, public perception of external threat will ultimately drive military budgets and budgets will enable-or retard- military education". In 2021, with budgetary constraints so obvious in the UK and the nature and extent of the external threat under debate, the value of this chapter far transcends the extent of its time span and the distance across the Atlantic.

"Where are we Nav"? The timeless, if perhaps apocryphal question of the pilot to his navigator, is answered in the

context of contemporary RAF Education and Training by Jim Beldon, a serving RAF officer with very wide operational experience and a former Director of Defence Studies (D Def S) for the RAF. His collaborator in this concluding chapter is Peter Gray, now a prolific and innovating academic in the air power field, himself a former Director of Defence Studies.

Group Captain Beldon explains how the personal interest of Air Chief Marshal Cameron, then Chief of the RAF Air Staff (CAS), led to the revival of air power thinking and studies in the RAF in the 1970s. He established the post of Director of Defence Studies with the responsibilities of encouraging thinking about air power in the RAF itself and establishing links with other Air Forces, within Academe in the UK and abroad. Since then, in Jim Beldon's words, the role of the D Def S, "is to act as CAS' guardian of the Conceptual component of fighting power".

He reminds us that the physical component of fighting power may be compared to the body, the moral component to the heart and the conceptual to the brain. The last provides the framework for thinking about all aspects of fighting power and is the "wellspring" for creative and innovative thinking on which our concepts and doctrine are built, essential for their synchronisation. Almost 50 years ago, Sir Michael Howard, the doyen of British military historians and strategic military thinkers, observed that it was less important to have the right doctrine from day to day than it was to have "the capacity to get it right quickly when the moment arrives". That moment, argues James Beldon, is now constant, and we need the best minds to address the most complex and threatening challenges of our own age and the next.

Group Captain Beldon describes how academe has in many locations internationally accepted the academic credibility and utility of "War Studies" which transcend

the traditional didactic content of battles, biographies and regalia to emphasise rigorous studies which can educate military professionals and civilian students alike to the nature of modern warfare itself. He describes the comprehensive steps taken by the RAF to provide the institutional framework to nurture the conceptual foundations from which all the Service's capabilities can be ultimately generated. The RAF's Centre for Air and Space Power Studies (RAF CASPS) cooperates with the MOD Development, Concepts and Doctrine Centre and the RAF's Air and Space Warfare Centre and Tedder Academy of Leadership. It maintains close communication with the Service's operational, personnel and capability staffs to identify suitable areas for research either at universities or military colleges. King's College London Defence Studies Department, itself the creation of Michael Howard, provides the academic pillar for professional staff training.

These comparatively modern innovations supplement the well-established CAS Fellowship Scheme by which individuals may be selected to undertake post graduate studies at universities or think-tanks. Research priorities are set by the RAF's Air Concepts, Doctrine and Strategic Analysis Committee. In theory, the combined provision of higher and broader education opportunities should provide the Service with a rich vein of innovative thinking for employment across the spectrum of ranks and specialisations. The Director of Defence Studies coordinates appointments of CAS Fellows with career management staffs as far as possible. Unfortunately, it is apparent that in fact this is not always possible. Many appointments are annotated as "joint service" which in practice usually means rotational with army and navy. Others retain "job specs" which focus on relevant training and experience but do not include higher academic achievements. Personnel staffs do not usually have the authority to disregard or exceed such guidelines. Recent statements from MOD about "Thinking to Win"

have emphasised the importance of ethnic and gender diversity in all aspects of career management without any apparent references to the sustained importance of and priority to the conceptual component. Group Captain Beldon concludes that "our engagement with a flourishing community of air and space power thinkers in academia will remain a vital constituent - not just of our conceptual component - but our fighting power as a whole".

Yes indeed, but the cumulative lesson from this volume is that such engagement must be translated into permanent influence over operational decision making and associated deployment of human resources. Otherwise, it will wither under the pressure of contemporary priorities. It cannot be allowed to depend on the presence of enthusiastic individuals or external support. That in turn suggests that the preservation of a healthy conceptual component must be a very high continuous priority for Royal Air Force senior commanders, which is why "Educating Air Forces" should be a mandatory item in *CAS Reading List*.



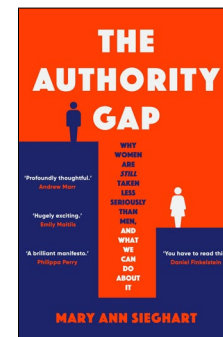
## The Authority Gap: Why women are still taken less seriously than men, and what we can do about it

By Mary Ann Sieghart

Publisher: London: Transworld, 2021

ISBN: 978-0857527561, 375 pages

Reviewed by Group Captain Paul Sanger-Davies



This is an excellent book which we should all read, as it reveals and addresses the startling gap which still persists between men and women, both within our places of work, and in our everyday lives. It is also inspiring, as it explores the measures which we can all take to address such systemic challenges caused by our inherent social conditioning.

Mary Ann Sieghart was Assistant Editor and columnist at *The Times* for 20 years specialising in politics, economics, parenthood and feminism, and has presented programmes on BBC2 and BBC Radio 4. She has been a Visiting Fellow of All Souls College, Oxford and is a Visiting Professor at King's College London.

*The Authority Gap* examines this issue of deep asymmetry through the lenses of the lived experiences of women from across the international spectrum, and from a cross-section of society including politicians, academics, writers and experts in their respective fields. The author interviewed about fifty of the world's most powerful, successful and authoritative women, to understand their personal experiences of the *Authority Gap*, noting that it affects women all over the world, whatever the differences in culture. Sieghart notes that "it's as if men are swimming with the current in a river and women are swimming against it" (p. 17).

The author highlights that there is still an 'Authority Gap' between men and women; an irrational and anachronistic

product of social conditioning and outdated stereotypes, caused by our use of heuristics, which divide the world into categories so that we don't have to process too much information. Yet Sieghart emphasises that our use of such stereotypes does not have to be evolutionarily determined from the Stone Age; it can be socially constructed from the contemporary world (p. 5).

Helle Thorning-Schmidt, the former Danish prime minister noted that "we are people who walk around with a brain that is wired to be extremely prejudiced against female leaders because it just goes against the grain of what our Stone Age brain can capture" (p. 5).

Sieghart also highlights that this is not a zero-sum game, and that there is no need to despair, as we can narrow the 'Authority Gap' in one generation. "It is only if we spot our bias and then actively correct for it, that things can begin to change" (p. 7).

The author offers a range of solutions to address this challenge (Chapter 15), enumerating the ways in which we can all do something, as partners, parents, colleagues, employers, teachers, governments and society (p. 281).

The author uses an engaging mixture of anecdotes which are both entertaining and shocking in equal measure, and which highlight her key points using a mixture of elegance and simplicity. The book is both easy to read,

and extremely poignant, as it represents one of the first contemporary examinations of the reality within which we are living. This makes it eminently suitable, both for general readers and scholars in gender studies, diversity and inclusivity. Sieghart quotes Antonio Guterres, who noted that “the greatest barrier to gender equality is the fact that we have a male-dominated world, and many men don’t even realize this. Many men take for granted the world as it is, and they look at gender equality as almost an aberration” (p. 279).

Sieghart also highlights the benefits of increased levels of gender equality, both within organisations and across society, noting that “women are particularly good at people management (and) transformational leadership, being democratic rather than autocratic leaders”. “During the COVID-19 pandemic, we all saw how much more successful, on average, female leaders were than male ones” (p. 33).

It is hoped that everyone who reads this excellent book will start to recognise their own biases, and those being displayed on a daily basis in the world around them. This is a consciousness-raising exercise for us all (p. 7).

From our Royal Air Force perspective, the final words have to come from Mary McAleese, the President of the Republic of Ireland (p. 308);

*If men don't take women equally seriously, we end up with this world that flies on one wing – it can't get elevation, it can't get direction it flaps around rather sadly.*

*And that's our world, because of the refusal to use the elevation and direction and the confidence that comes from flying on two wings.*

*And the sad thing is that very often this male wing seems to think it has to spend a lot of effort keeping the other wing down.*

*And that takes effort, its wasted lives. It has caused dysfunction in relationships, in families, in communities, in workplaces, in politics, in warfare.*

*That's where we have to understand that when women flourish and their talents and creativity flourish, then the world flourishes and men flourish.*

*We all flourish.*

## Noise: A Flaw in Human Judgement

By Daniel Kahneman, Olivier Sibony and Cass R Sunstein

Publisher: William Collins: London, 2021

ISBN: 978-0008308995, 464 pages

Reviewed by Wing Commander Amanda Scarth

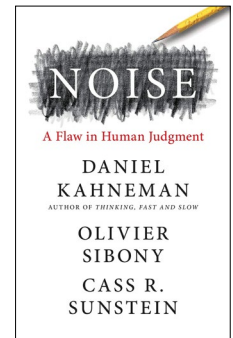
Best-selling authors Daniel Kahneman (*Thinking Fast and Slow*) and Cass Sunstein (*Nudge*) are joined by Olivier Sibony, an eminent Professor of Strategic Thinking from Said Business School, Oxford University, in exploring why most people, especially professionals working within large and complex organisations often make poor judgements. They examine the factors which shape such decision-making including the 'noise' which is inherent within most workplaces. Some judgements are biased, or systematically off target, whilst others come from those who are expected to fit within the norms of the organisation yet whose judgement often falls wide of such marks of normality.

This book provides important reflections for anyone involved in decision-making, especially at more senior levels, as it will highlight how their decision-making ability can be affected by factors within the organisation, and more importantly what they can do to counter such influences upon their judgement. It is easy to read and digest and is presented using a series of illuminating examples from across a range of differing career sectors, including the judicial system, the financial and medical worlds. *Noise* is also a welcome complement to the previous popular works by Kahneman and Sunstein on how to improve human judgement and behaviour.

'Noise' is also described as the cause of significant variation in the judgements which experienced

professionals make relating to the same cases or circumstances. Most organisations expect consistency from their professionals whereas the problem is that most humans are unreliable decision-makers. As an example, a study of the legal rulings which judges made in criminal cases demonstrated that sentences on similar cases did not just differ slightly from judge to judge – they varied wildly. For instance, a drug dealer would be sentenced to anything between one and ten years for a similar offence, whereas a bank robber would face between 5 and 18 years. In addition, researchers have confirmed that professionals often contradict their own previous judgements when given the same data on different occasions, and they also tend to trust the judgements of their professional colleagues without question. This scatter-gun variation in judgement is known as 'noise' and can often be attributed to what time of the day the professional was making their judgement. For example, those working in the mornings or immediately after lunch gave out more lenient sentences than those making judgements later in the day. When software developers were asked on two separate days to estimate the time which it would take them to complete a specified task, their predictions varied by 71%.

The book highlights that 'noise' within organisations is often insidious – it goes unnoticed by those working within it. *Noise* explores how organisations can assess



the level of 'noise' by conducting 'noise audits', and then goes on to examine the different types of errors which individuals can make, including those from 'occasion noise' which is inherent within group discussions.

*Noise* examines the central cause of poor decision-making within human psychology including the impact of heuristics. It then goes on to recommend that to get better decisions, which it terms decision-hygiene, where it is invariably better to ask several people independently for their views (often known as the wisdom of the crowd), yet that those opinions must be independent, to avoid groupthink.

Kahneman et al also examine whether the use of algorithms can reduce or even eliminate errors of judgement caused by 'organisation noise', noting that such technological approaches are often opaque, as people blame the algorithm as opposed to blame the human decision-maker. The book also highlights the risk of algorithmic bias, where algorithms don't merely replicate human bias, yet amplify them by a significant amount.

*Noise* concludes by examining what the right level of 'noise' is within an organisation and encourages leaders to make conscious efforts to reduce 'noise' levels to acceptable levels.

This book is especially important for our Royal Air Force readership, including those involved in decisions relating to flight safety and airworthiness. *Noise* encourages professionals to reflect upon the quality of their decision-making and the external factors which exist within their working environments which might impact upon their ability to make consistently accurate decisions. If by reading this important work it starts a discussion between colleagues on ways to reduce 'noise' and improve the

quality and consistency of their professional judgements, then it will have proven its worth.

## The Russian Understanding of War: Blurring the Lines between War and Peace

By Oscar Jonsson

Publisher: Georgetown University Press, 2019

ISBN: 978-1-62616-733-9, 186 pages

Reviewed by Group Captain John Alexander

**T**he *Russian Understanding of War* analyses the evolution of Russian military thought and how Russian thinking about war is reflected in recent crises, a subject of increasing importance to British and Allied defence policy, concepts and emerging doctrine. Jonsson convincingly argues Russia's conception of the nature of war has changed, blurring the line between peace and war, and placing greater emphasis on information warfare and political subversion below the traditional threshold of armed conflict. Thus, Russia has considered itself to be at war with the United States and its allies since the prodemocracy 'colour revolution' which overthrew Ukraine's President Yanukovich in 2014. Hence the British Government's 2021 *Global Britain in a Competitive Age: The Integrated Review of Security, Defence, Development and Foreign Policy* repeatedly notes Russia will remain the most acute direct threat to the UK's security and is one of the authoritative, malign actors testing the boundary between peace and war. Moreover, the focus of the *Integrated Operating Concept 2025* is on how UK Defence confronts the sub-threshold threat while maintaining its warfighting capabilities. Although Jonsson finds the balance of Russian thinking about war has shifted from military means to non-military means, unlike some commentators he also highlights Russia's thinking on the continued use of both, and the substantial modernisation of Russian military means since 2008. Many RAF readers will have seen Russian theory in practice when operating in proximity to Russian forces

in Syria or Eastern Europe and whilst defending the seas around the United Kingdom.

Jonsson provides a much-needed long view of how Russian military thinking has developed from the Bolshevik Revolution to the present, and particularly in the past three decades since the end of the Cold War. Jonsson is a researcher at the Swedish Defence University and the book is based on his King's College London PhD thesis. The book's argument hinges on the distinction between the nature of war and the character of war, originally proposed by Carl von Clausewitz and taken up by V I Lenin, who paraphrasing Clausewitz defined the nature of war as the 'continuation of politics with violent means.' Jonsson's first of four chapters starts with the creation of the Soviet Union and the theoretical and methodological foundation of Russian military science, developing concepts such as operational art, the operational level of warfare and deep battle, that in many aspects persist to date. Following Marxist-Leninism, Russian military science is deductive, starting with the whole and then analysing how the components fit together, whereas the normal Western inductive approach builds from the specific to the general. Hence Russian military practice follows theory. Furthermore, a key element of Russian military science, like Marxist-Leninism, is historical analysis, encouraging evolutionary thought. The second chapter concerns the evolution of the post-Soviet Russian understanding of war since 1990.





Jonsson explains the Russian description of the impact of technology on the character of war by using theorist General Vladimir Slipchenko's taxonomy of "generations of warfare." His current sixth generation of warfare is characterised by precision weapons, information technology, electronic warfare, and non-contact (long-distance) warfare, dating from the Western superiority in Operation Desert Storm, (Operation Granby) in 1990 which so shocked the Russians.

Jonsson's final two chapters explain how the information technology revolution and the colour revolutions, starting in the mid-2000s, caused Russian theorists to question the character of war. The third chapter explains how the Russians see information warfare in two forms: first information-psychological warfare linked to the colour revolutions and second the information-technical, or digitisation, also improving conventional capabilities, although cyber warfare links the two. The final chapter explains how by 2012-14 the colour revolutions were seen by the mainstream of Russian theorists and elites as Western-created uprisings using information warfare, ideological influences, prodemocracy movements and non-violent protests supported by Western diplomatic and financial support, which were interpreted as an existential or warlike threat to Russia. Russia therefore now sees itself at war with the West, whereas the West does not see Russia as an existential threat. Furthermore, Russia sees Western threats, such as financial sanctions, as escalatory whereas the West does not.

Jonsson's short book provides many insights of interest to the air power theorist and practitioner. His research is based on the close examination of an extensive literature of Russian primary sources including security doctrines and the writings and statements of Russian military theorists (many serving generals) and political elites, to form an aggregate view. Jonsson demonstrates the extent

to which Russian military thought has been understudied and misunderstood in the West for the past three decades. Importantly, *The Russian Understanding of War* also puts the related Russian military modernisation programme centred on C4ISR, active defence and non-contact warfare using long range fires in context. However, for more detail, the reader will have to use the bibliography for further reading. Therefore, Russia's audacious combination of military and non-military means since 2014 should not have come as a surprise. This surprise, however, led some Western analysts to develop various complicated explanatory concepts and neologisms (or buzzwords) such as 'hybrid warfare' 'grey zone' or the so called 'Gerasimov doctrine' to explain Russian thinking, when the Russian theorists and practitioners refer simply to the combination of military and non-military means. As an example, Jonsson cites Frank Hoffman, who in 2005 introduced the term 'hybrid warfare' to mean a mix of regular and irregular warfare, as suggesting in 2018 that "the real gray zone is 'between our ears,' in our faulty models and education about what conflict entails". Jonsson's book addresses that gap.

## **Contents: The Chief of the Air Staff's Reading List 2020-21**

### **Rebel Ideas: The Power of Diverse Thinking**

By Matthew Syed

Publisher: John Murray

### **The Dragons and the Snakes: How the Rest Learned to Fight the West**

By David Kilcullen

Publisher: London: C Hurst & Co

### **The Culture of Military Organizations**

By Peter R Mansoor and Williamson Murray

Publisher: Cambridge University Press

### **Army of None: Autonomous Weapons and the Future of War**

By Paul Scharre

Publisher: WW Norton & Company

### **The Rules of Contagion: Why Things Spread and Why They Stop**

By Adam Kucharski

Publisher: London: Profile Books

### **War in Space: Strategy, Spacepower, Geopolitics**

By Bledwyn E Bowen

Publisher: Edinburgh University Press

### **The New Rules of War: How America Can Win Against Russia, China, and Other Threats**

By Sean McFate

Publisher: New York, William Morrow

### **Command: the Twenty-First Century General**

By Anthony King

Publisher: Cambridge University Press

### **The Future of NATO Air Power: RUSI Whitehall Papers 94**

By Justin Bronk

Publisher: Routledge

### **Sandworm: A New Era of Cyberwar and the Hunt for the Kremlin's Most Dangerous Hackers**

By Andy Greenberg

Publisher: Doubleday

## **Contents: The Chief of the Air Staff's Reading List 2019-20**

### **The Royal Air Force: The First One Hundred Years**

By John Buckley and Paul Beaver

Publisher: Oxford University Press

### **Flying to Victory: Raymond Collishaw and the Western Desert Campaign, 1940-1941**

By Mike Bechthold

Publisher: University of Oklahoma Press

### **Churchill: Walking with Destiny**

By Andrew Roberts

Publisher: Allen Lane

### **Bolts From The Blue**

By Sir Richard Johns

Publisher: Grub Street Publishing

### **Leaders: Myth and Reality**

By General Stanley McChrystal (US Army, Retired), with Jeff Eggers and Jason Mangone

Publisher: Portfolio Penguin

### **On Grand Strategy**

By John Lewis Gaddis

Publisher: Allen Lane

### **Blunder: Britain's War in Iraq**

By Patrick Porter

Publisher: Oxford University Press

### **The Secret World: A History of Intelligence**

By Christopher Andrew

Publisher: Allen Lane

### **Small Wars, Big Data: The Information Revolution in Modern Conflict**

By Eli Berman, Joseph H. Felter and Jacob N Shapiro

Publisher: Princeton University Press

### **LikeWar: The Weaponization of Social Media**

By P.W. Singer and Emerson T. Brooking

Publisher: Eamon Dolan/Houghton Mifflin Harcourt Publishing

## **Contents: The Chief of the Air Staff's Reading List 2018**

### **Routledge Handbook of Air Power**

By John Andreas Olsen

Publisher: Routledge

### **The Birth of the RAF, 1918**

By Professor Richard Overy

Publisher: Allen Lane

### **Over the Horizon: Time, Uncertainty and the Rise of Great Powers**

By David M. Edelstein

Publisher: Cornell University Press

### **Aerial Warfare: The Battle for the Skies**

By Frank Ledwidge

Publisher: Oxford University Press

### **The Vietnam War**

By Ken Burns and Lynn Novick

Broadcaster: Public Broadcasting Service (PBS)

### **The Future of War: A History**

By Sir Lawrence Freedman

Publisher: Allen Lane

### **The Cybersecurity Dilemma: Hacking, Trust and Fear Between Nations**

By Ben Buchanan

Publisher: Hurst and Company

### **Shoot, Don't Shoot: Minimising Risk of Catastrophic Error Through High Consequence Decision-Making**

By Dirk Maclean

Publisher: Air Power Development Centre (Australia)

### **War in 140 Characters: How Social Media is Reshaping Conflict in the Twenty-First Century**

By David Patrikarakos

Publisher: Basic Books

### **Air Force Blue: The RAF in World War Two**

By Patrick Bishop

Publisher: William Collins

## **Contents: The Chief of the Air Staff's Reading List 2018**

### **The War in the Air: Being the Story of the Part Played in the Great War by the Royal Air Force**

By Sir Walter Alexander Raleigh and Henry Albert Jones

Publisher: Oxford Clarendon Press

### **Sagittarius Rising: Reminiscences of Flying in the Great War**

By Cecil Arthur Lewis

Publisher: Peter Davies

### **Bomber Harris: His Life and Times**

By Henry Probert

Publisher: Greenhill Books

### **First Light**

By Geoffrey Wellum

Publisher: Viking, London

### **Strategic Air Offensive Against Germany 1939-1945**

By Charles Webster and Noble Frankland

Publisher: HMSO

### **With Prejudice: The War Memoirs of Marshal of the Royal Air Force Lord Tedder**

By Arthur William Tedder

Publisher: Cassell

### **The Right of the Line: The Royal Air Force in the European War 1939-1945**

By John Terraine

Publisher: Hodder & Staughton

### **The Central Blue: Recollections and Reflections**

By Sir John Cotesworth Slessor

Publisher: Cassell

### **The Impact of Air Power: National Security and World Politics**

By Eugene M Emme (Editor)

Publisher: Van Nostrand Co.

### **The Air Campaign: Planning For Combat**

By John A. Warden III

Publisher: National Defense University Press



The views expressed by the reviewers in this list are theirs and theirs alone.

Inclusion of a particular book within the reading list should not be taken to mean that the Royal Air Force or the Ministry of Defence endorses the contents. Manuscripts with challenging and even contrarian views will be included in order to stimulate thinking, discussion and debate.

## Notes

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