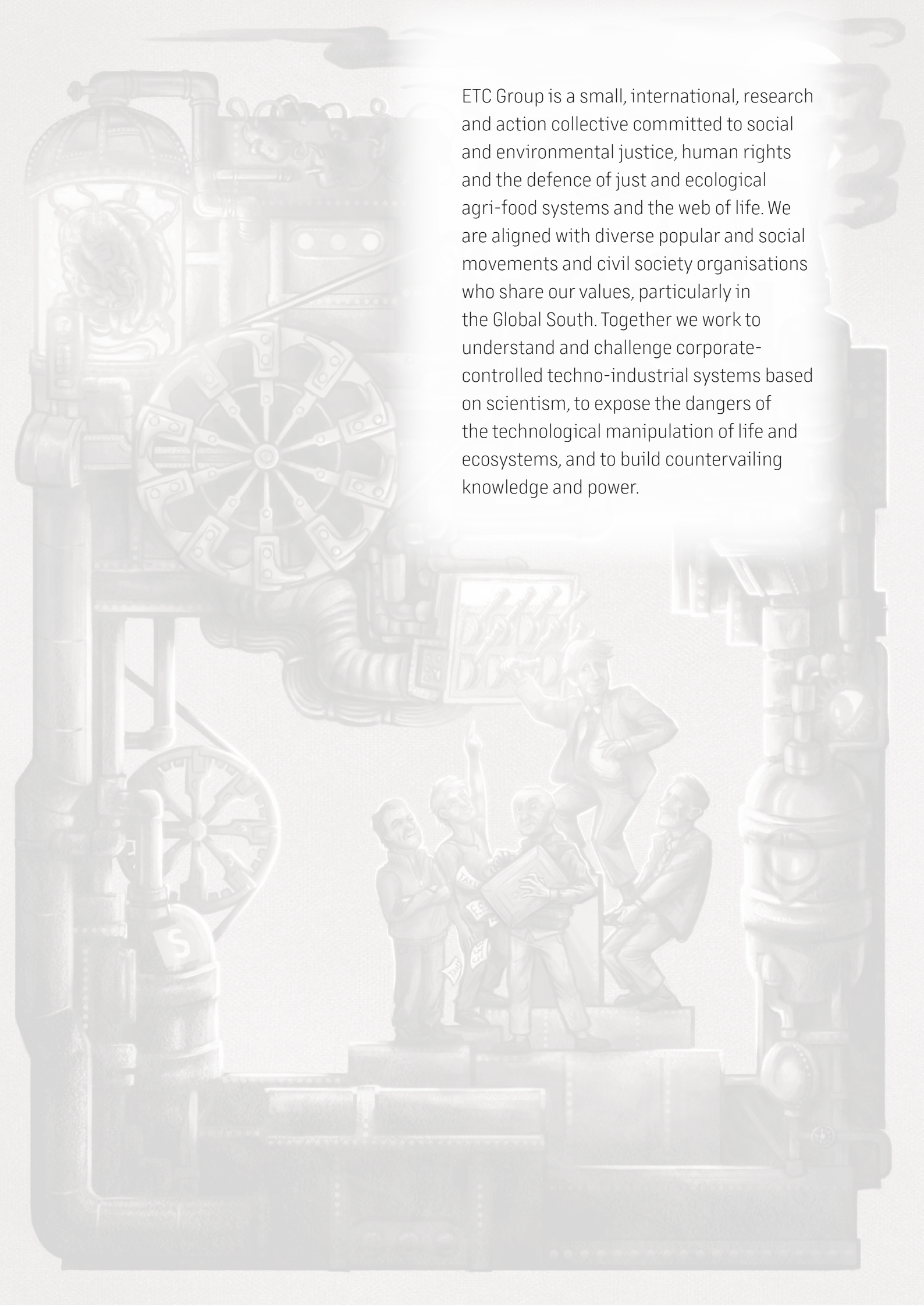




ARIA

THE UK'S DUBIOUS 'DEEPTECH' AGENCY





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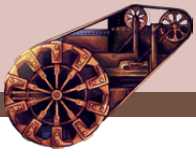
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OVERVIEW

'MOONSHOT' SCIENCE OR GEOPOLITICAL GRIFT?



In 2025 global policymakers and civil society were surprised to learn that a new 'high risk-high reward' agency funded by the UK Government was starting to bankroll solar geoengineering experiments (which involve the intentional manipulation of our climate).¹ This flies directly in the face of agreed international moratoria and norms.²

The agency in question is called 'ARIA' – the Advanced Research and Invention Agency – and it models itself on another well-established 'high risk' funding agency, established by the US military – DARPA (The Defense Advanced Research Projects Agency). While ARIA isn't a military funder, it is one of a rash of somewhat recent 'DARPA-like' funding agencies and 'moonshot' outfits from California to Japan and Germany that claim to be trying to change the culture of big science funding in the so-called 'deep tech' commercialization space (see Box 2: "Moonshots, Skunkworks and DARPA Clones – other ARIA-like initiatives").

However, ARIA stands out from these other moonshot initiatives for its wildly ambitious appetite, style and level of public funding. It is already letting rip on a giveaway bonanza of a billion pounds of ring-fenced UK taxpayer money³ for sometimes crazy sounding 'deeptech' proposals. ARIA has also been deliberately structured by a parliamentary act⁴ to be exempted from a key element of public scrutiny, the UK's Freedom of Information Act, and prides itself on bringing Silicon Valley's free market fundamentalism and its free-wheeling 'move fast and break things' ethos to disrupt the buttoned-up British science establishment. This includes breezily breaking critical precautionary

norms and challenging international moratoria on climate geoengineering. ARIA's leadership is also looking the other way on conflict-of-interest norms while being formally exempt from freedom of information oversight as it licenses itself to pursue industry-friendly tech experimentation in geoengineering, genetic engineering, brain tech, automation and Artificial Intelligence. Meanwhile ARIA is lending the legitimacy of government funding to these risky tech research areas that just a few years ago were relegated to the margins.

The entitled attitude of this British agency, towards both risk-taking and rule-bending, seems to have some UK ministers and advisors a little uncomfortable, but is stylistically intentional. Outwardly ARIA's leadership like to project a brash, self-confident enterprise conceived in patriotic and 'Anglofuturist' terms:⁵ bold, future-looking, 'motion-biased' and experimental. In pursuit of a Victorian-style version of 'progress', deliberately invoking gentleman inventors of yesteryear, ARIA sees itself working to re-ignite a lost age of British scientific and industrial greatness and to remake the UK as a global "science superpower".⁶ In this way ARIA's purpose is projected by its visionaries as a swashbuckling rebuild of a former British glory that had stagnated mid-century with the fall of the empire.

The deeper truth, however, seems rather more desperate and transactional. Behind the Union Jack-waving, ARIA has a decidedly American orientation, so far pointedly ignoring Britain's Commonwealth partners and diverse cultures at home when telling a transatlantic story of where 21st century

'invention' comes from. Conceived by an oddball Brexit nationalist, Dominic Cummings, working under then-British PM Boris Johnson, this paper shows that ARIA is both part of a project to promote an 'Anglosphere' of influence boosting Britain's role in the world and that it is tied to the ideological interests of a network of mostly US-based tech billionaires, libertarians and transhumanists building a new conservative 'progress movement'. At a time when high interest rates and skyrocketing AI infrastructure costs mean that the usual sources of funding for 'high risk-high reward' tech development (namely US venture capital) is in short supply,⁷ ARIA offers tech bro elites a honeypot of free UK funds for their pet science projects. In this way ARIA is playing a geopolitical brokering role for a UK government desperate to curry favour in the gilded board rooms of Silicon Valley.

ARIA's realpolitik role may therefore be less about promoting science and technology and more in line with the geopolitical project its ideological founder always hoped for: realigning the British economy with the interests of American capitalism. By offering an attractive taxpayer-sponsored playpen to US tech investors the hope appears to be to ingratiate 'UK PLC' with the Silicon Valley elites currently targeting the global economy – and maybe achieving

some 'skin in the game' of tech investment along the way. This role aligns with the current UK government's strategy of buttering up the Trump administration's tech pals via gilded state dinners and AI-coded 'tech prosperity deals'.⁸ And even while the much vaunted US-UK tech deal may officially be on temporary hold as of December 2025 (as Trump pitches it against US-UK tariff negotiations in other sectors),⁹ ARIA continues to promote US-UK tech interests unabated. With its determination to cast aside both transparency and the precautionary principle and to erase other pesky ethical lines of good science governance, ARIA may be just another means of serving up Britain's post-Brexit public resources to an America First tech brologarchy, in a desperate scramble to maintain a place at the table.





PART 1:

WHAT IS ARIA? WHERE DID IT COME FROM?



The UK's Advanced Research and Invention Agency (ARIA) was created by a dedicated act of the UK Parliament in 2022 and became functional in January 2023. As a UK funding agency for frontier research, it has been deliberately kept separate from the rest of the UK research funding infrastructure (collectively known as UK Research and Innovation (UKRI)) – much to the mystification of research scholars and experts.¹⁰ Upon establishment, ARIA was originally assigned £800 million (over US\$1 billion) of public money to grant over five years. However, that amount was upped to almost £1 billion (US\$1.4 billion) in June 2025 by UK Chancellor Rachel Reeves,¹¹ with an October 2025 update that ARIA's budget would rise from £220 million a year to £400 million a year by 2029/30.¹² This, even while the UK Government was enacting cuts across other parts of government including particularly painful cuts to foreign aid.

ARIA styles itself as a 'high risk-high reward' research funder or 'moonshot' agency. It is modelled on the famous DARPA (Defense Advance Research Project Agency) of the US military.¹³ DARPA is known for making 'big funding bets' on unlikely cutting-edge technologies that have occasionally paid off. Most famous is the creation of ARPA-net which later became the internet. DARPA has also bankrolled highly problematic technologies such as deadlier weapons,¹⁴ gene drives,¹⁵ Agent Orange and surveillance technology.¹⁶ Part of the 'success' of DARPA was that inventions funded by the agency could subsequently be rapidly purchased and scaled by the deep pockets of the US military machine. ARIA does not come with this attached purchasing power but is

based on attracting venture capital funds instead.

The idea that Britain needs its own 'DARPA-style' funding agency originated with controversial political advisor Dominic Cummings, known for his key role in masterminding the 'Vote Leave' campaign (which successfully pushed for Britain to leave the European Union). As far back as 2005 Cummings, then founder of the right wing 'New Frontiers' think tank, had argued that establishing a UK version of DARPA was essential to "making Britain again a global leader."¹⁷ When he was controversially brought in as chief political advisor to flamboyant Prime Minister Boris Johnson, Cummings famously set his public WhatsApp profile tagline as 'Get Brexit Done – then ARPA.'¹⁸ He had made a deal in his living room with Johnson that his employment at the heart of government was contingent on the prime minister also agreeing to set up a DARPA-like agency¹⁹ (See Cummings' profile below). Cummings argued that empowering a UK ARPA was an institutional way to reverse the economic stagnation of Britain that occurred under the bureaucratic European Union. Cummings' vision was to hitch Britain's star to what Cummings saw as the incredible industrial dynamism of the American tech sector instead.

While Cummings' tenure at the heart of the UK government was short, stormy, and controversial, the government nonetheless 'bought' Cummings' argument and maintained its commitment to establishing an 'ARPA', renaming it 'ARIA' to put an emphasis on 'invention' by adding an 'I' (seemingly to invoke the legacy of British

gentleman inventors of former times). Much of the character of the institution that Cummings argued for was detailed in a 47-page manifesto on his personal blog in 2018²⁰ and the broad strokes of Cummings' vision largely survived into legislation and became baked into ARIA. This included keeping ARIA at arm's length from the government, with very limited accountability. For example, despite being a non-military agency of the UK government, ARIA was very unusually exempted from Freedom of Information legislation and government procurement rules.²¹

Key staff have also been deliberately appointed to ARIA and its board despite extensive conflicts of interest based on their corporate holdings and role in the private sector – they are not expected to relinquish those holdings or positions. Moreover, it emerged that the senior staff member at ARIA, then Chief Executive Ilan Gur – an American tech investor recruited from

Silicon Valley – was awarded an annual salary of £455,000 (US\$600,000²² – reportedly triple that of the British Prime Minister).^{23,24}

“ARIA will have maximum autonomy over its research and project choice; its procedures; and its institutional culture. Decisions on the programme portfolio will be set by ARIA, not ministers, and allocation of funding to research projects will be decided by those with relevant technical expertise.”²⁵

Box 1: ARIA's very American tilt and the 'Anglosphere'

As an agency funded by the British taxpayer, ARIA has taken great pains to present itself as a British institution promoting UK interests. However, a closer look at ARIA and where it comes from reveals that the ideological roots of the agency are notably US-oriented. Key members of recent and current executive staff, board and advisors are from the USA or have close links with Silicon Valley, including ARIA's newly appointed Executive Director Kathleen Fisher, previously with DARPA, and Advisors Patrick Collison of Stripe, Arun Majumdar of ARPA-E, Katie Rae of Engine Ventures, Özlem Tureci of BioNTech, and now Ilan Gur (who recently stepped down from being ARIA's first Executive Director), and numerous 'Activation Partners'.

Notably, Chair of ARIA's Board Matt Clifford, while British by citizenship, studied at MIT and has built his entire career around building bridges between the UK and the USA. Indeed, his Entrepreneurs First accelerator explicitly describes itself as a 'bridge to Silicon Valley'²⁶ and encourages founders to move to and base their new companies in Silicon Valley in California. This US orientation is very much in line with Dominic Cummings' own fascination with US tech and startup culture, and the broader intention to hitch the British economy more firmly to American (especially Silicon Valley) innovation. In a review of ARIA's narrative roots, political scientist Francesca Melhuish observes that both Dominic Cummings' original vision and the subsequent realization of ARIA are part of a 'Global Britain' strategy which draws on the long-standing notion of a transatlantic 'Anglosphere'.

Box 2: Moonshots, Skunkworks and DARPA Clones – other ARIA-like initiatives

The much-referenced model on which ARIA is modelled is the US Defense Advanced Research Projects Agency (DARPA). This was originally established as just ‘ARPA’ by US President Dwight Eisenhower in 1958 as a strategic response to the surprise of Russia launching the Sputnik satellite (and indeed the space race) the previous year. ARPA (later amended to DARPA) was directed to focus on ‘high risk’, ‘high gain’ and ‘far out’ technical research for the military and was overseen by a team of ‘Programme Managers’ who were given a lot of agency and latitude to direct funding. It was hoped that by betting big on a cadre of geniuses to do what they wanted America might regain the technological high ground in the Cold War.²⁷

DARPA’s known technical achievements came to include satellite navigation technology, drones, self-driving cars, work on mRNA vaccines later used for COVID, and the Internet (originally called ARPA-Net).²⁸ This has included moving forward other highly problematic technologies such as the toxic defoliant Agent Orange, mass surveillance systems and Gene Drives (engineered organisms designed to spread an altered trait through a population or cause species extinction).²⁹

Dominic Cummings’ fixation on creating a British ARPA has arisen alongside a rise of interest in ARPA-like bodies by other governments too. In 2018 Japan established its ‘Moonshot R&D system’ under which the Japanese Government sets ambitious goals and concepts for societal issues that are difficult to tackle but will have profound impact and invites research bids.³⁰ The following year Germany launched SPRIN-D as a non-military German version of DARPA to fund ambitious research across different tech areas including biotech, energy and computing.³¹ The European Union’s Joint European Disruptive Initiative (JEDI) was also launched in 2018 to develop breakthrough technologies by organizing ‘grand challenge’ funding competitions.³²

In reviewing the first two years of ARIA’s work, its Chair Matt Clifford boasted that “Governments around the world [are] engaging with us in order to emulate ARIA’s model in their country”. Although an ‘aria’ in music refers to the song that a singer sings alone, when it comes to experimenting with DARPA-like structures ARIA is more part of an existing chorus than a lone or lead voice. Nevertheless, our research indicates that ARIA is leading the pack in terms of taking risks that others aren’t, including on outdoor geoengineering experiments (see ‘Case Study 1: Geoengineering’ below).

However, as Melhuish also observes, ‘English-speaking’ has long been coded language for racially white settler countries such as the US, Canada and Australia, ignoring that much of the non-white British Commonwealth is in fact English-speaking too. In September 2025, the British government’s attempt to entice the US tech elite into this ‘Anglosphere’ vision of a geopolitical alliance was on full display as the UK’s Prime Minister Sir Keir Starmer and King Charles III hosted Donald Trump and a veritable ‘who’s who’ of American tech oligarchs

at a lavish and much reported state banquet at Windsor Castle. Guests included NVIDIA CEO Jensen Huang, Apple CEO Tim Cook, venture capitalist David Sacks, Google president Ruth Porat, Microsoft CEO Satya Nadella, Salesforce CEO Marc Benioff and OpenAI’s Sam Altman.³³ The following day many of those same tech leaders signed a ‘tech prosperity deal’ for US-UK collaboration that included the UK backing the building of more AI data centres by US companies in exchange for £31 billion investment into the UK.³⁴

The charismatic 'big beasts' that built ARIA

In British politics charismatic characters who dominate political parties are sometimes referred to as 'big beasts'.³⁵ While ARIA has over 60 staff and many 'Creators' and 'Activation Partners' the tone, priorities and strategic direction of the agency have come firmly from a handful of 'big beasts'. Understanding these four 'big beasts' helps to understand the priorities and logic of ARIA more clearly.

"What we have done is fixate on a particular institutional model, imported from the US in the late '60s, and dumped into Britain today, as the way in which somehow, magically, we are going to cut through all sorts of real or perceived barriers and obstacles in our existing research and innovation system. I just think that is a very flawed way to do this."

Professor James Wilsdon,
Research on Research
Institute, speaking about
ARIA and DARPA³⁶

Dominic Cummings

As already noted, ARIA is the brainchild of Dominic Cummings, the unorthodox political advisor to UK Prime Minister Boris Johnson and the architect of the successful 'vote leave campaign' that resulted in the UK leaving the European Union (Brexit) at the end of 2020. Essentially libertarian, patriotic and wedded to a particularly Victorian view of English greatness, Cummings is notorious in the UK for his Svengali-like influence on the political process during the Johnson premiership and was described by former Prime Minister John Major as a "political anarchist"

who was "poisoning politics".³⁷ Cummings was finally forced to resign³⁸ when it became clear that he had broken the COVID lockdown restrictions that he himself had helped craft. He later turned viciously on his political boss.³⁹

Cummings first mooted the importance of a DARPA-like agency for the UK while running the 'New Frontiers' think tank. He was obsessed with the legacy of Barnes Wallis – the British inventor of the dambusting 'bouncing bomb' – who had called for a 'new Elizabethan' era of British technical greatness.⁴⁰ Cummings later claimed that he only agreed to work for Johnson after the future Prime Minister made a 'deal' in his living room to establish an ARPA agency.⁴¹ He referred to ARPA as one of his 4 "terrorist demands".⁴² Cummings' copious blog postings at the time made it clear that he saw Britain as having suffered industrial stagnation during its membership of the European Union under the influence of bureaucracy and mediocrity and that a DARPA-like body staffed by geniuses who were left to themselves could turn around Britain's industrial decline in the Post-Brexit era.⁴³ It's a narrative that aligns with his broader theory of change described by one political scientist as "Cummings' vision of small, secretive groups of brilliant people working to save the rest of us from disaster."⁴⁴

"Late Victorians imagined that a flourishing Anglo future would emerge from the formal union of Britain and America. American industrialist Andrew Carnegie was a major early proponent, arguing for an Anglo-American alliance – a 'utopian' vision where 'the English-speaking nations could control the future of the world.'"⁴⁵

In particular Cummings, who has been described as an ‘Anglofuturist’,⁴⁶ was obsessed with American tech innovation and sought to strengthen the ‘Anglosphere’ of UK-US influence, seeing the Silicon Valley tech accelerator Y-Combinator, run by Sam Altman, as representing a current continuation of the sort of risk taking he celebrated in ARPA.⁴⁷ Cummings, who had hired the controversial company Faculty AI for the Vote Leave campaign, was also enamoured with Altman’s other company, OpenAI (which later launched ChatGPT and the current Generative AI bubble). In 2018, on his first day working at the Prime Minister’s office, Cummings famously turned up to work wearing an OpenAI T-shirt⁴⁸ – a statement of intent on clearing away government bureaucracy for AI-led change two years before ChatGPT and six years before Elon Musk took the same approach to Washington with his Department of Government Efficiency (DOGE) apparatus. As a 2019 profile in Wired magazine pointed out “A cursory look at Cummings’ fabled blog will find it peppered with references to California’s startups and technology executives, from payment company Stripe, to AI lab DeepMind, to venture capitalist Peter Thiel.”⁴⁹ All three of these examples were to become important in the makeup of ARIA (see below). While Cummings has not been formally involved with ARIA since its establishment he gave evidence to parliament about the creation of the agency. Cummings is now proposing the idea of a new ‘Startup Party’ in UK politics and is very active in a new tech industry-aligned UK political formation called ‘Looking for Growth’ allied with the emerging ‘Progress Studies’ movement (see Box 3 below). He recently spoke at that organisation’s annual conference wearing a blue ‘ARIA’ cap.⁵⁰

Matt Clifford

More than anyone else, UK tech entrepreneur Matt Clifford, who serves as the Chair of ARIA’s Board, appears to exercise outsize influence on the direction, strategy and image of the new agency. Clifford, a former McKinsey consultant, made his career and money co-founding Entrepreneurs First⁵¹ – an ‘accelerator’ programme for UK tech founders that apes Silicon Valley’s better

known ‘Y-Combinator’. Through a series of deft political moves Clifford has become the most powerful tech diplomat in the UK – largely because of leveraging his relationships with the Silicon Valley tech elite. When he was shown an early demo of ChatGPT by Netflix founder Reid Hoffman, Clifford parlayed that into a meeting between Prime Minister Rishi Sunak and OpenAI founder Sam Altman. This in turn convinced Sunak to host a high-profile global AI Safety summit for which Clifford was then appointed as the Prime Minister’s representative.⁵²

“Clifford has almost single-handedly shaped Downing Street’s thinking on artificial intelligence. If his thesis is correct – that AI is the most powerful technology that exists or has ever existed, that it will make the world unrecognisable by the time his children are adults – then this role arguably makes him the most important person in the country.” The Observer⁵³

Clifford subsequently served on the UK’s AI Security Institute, and when Labour’s Keir Starmer was elected Prime Minister Clifford joined that government as a part time AI advisor for some months, penning a fifty-point policy agenda on AI (the AI Opportunities Action Plan).⁵⁴ That list was approved and implemented in totality by Starmer who, at the time, came to rely almost totally on Clifford for tech policy, seemingly to the exclusion of other less gung-ho voices. “He is not elected, and yet he has vast amounts of power to shape policy,” said one British tech executive of Clifford.⁵⁵ He has been particularly criticized for promoting the view that AI models should be allowed to ignore copyright law when ingesting training data.⁵⁶ He declined to take a full advisor position so he could

continue to run his main business, Entrepreneurs First. While most people moving into government usually give up business interests for conflict of interest reasons investigative journalists with Democracy for Sale discovered that Clifford continued to hold about 50 financial interests and eight external occupations, as well as holding stakes in a further 449 companies through his investment firm.⁵⁷ As one industry source told Democracy for Sale “Of course, you want entrepreneurs involved – But you don’t give one man – who runs the firm with the most AI investments in Europe – the job of writing the policy, then accept all his recommendations the same day he publishes his plan.” It seems that the only company Clifford disinvested from, after pressure, was Faculty AI⁵⁸– the controversial firm that had dubiously assisted Dominic Cummings in the Vote Leave campaign.⁵⁹

In 2018 Clifford had started a blog on tech policy (“Thoughts in Between”)⁶⁰ in which he picked up Cummings’s theme of a DARPA-style agency and made it part of his own agenda, even holding an influential book club on the topic. As such he was well placed to become the first chair of ARIA. His own vision and rationale for the agency have remained in lockstep with that of Cummings, although he brings a deeper focus on the importance of entrepreneurial and start-up culture and more firmly connects to US tech billionaires and Silicon Valley. Trained as a historian, the public story of ARIA he tells continues the same triumphalist tone as Cummings, name-checking great inventors of British history (mostly men) and evoking a patriotic grand destiny for ARIA based on what he calls “British exceptionalism.”⁶¹

Lord Patrick Vallance

Like Cummings, Patrick Vallance is another household name in UK society. As Chief Science Advisor to Prime Minister Boris Johnson he gave weekly TV addresses on how the nation should conduct itself through the COVID pandemic. Formerly a pharmaceutical executive with Glaxo SmithKline,⁶² Vallance’s role as Chief Scientist became controversial when he suggested the UK

population might reach ‘herd immunity’ – a term he later regretted using.⁶³ As chief scientist Vallance was a loud proponent of setting up ARIA to escape oversight: “All the countries that have tried to replicate an ARPA-like model have kept it on too short a leash, and that kills it,” says Vallance. “The tendency in government very often is to get the leash shorter and shorter and shorter [...] because it’s public money, and people feel a responsibility, and it was new and shiny and everyone wanted to be involved.”⁶⁴ Much of the rationale underlying ARIA was shaped by the experience of the pandemic, especially in the creation of new vaccines for which Vallance, the former pharma exec, was a front row player. Vallance was subsequently placed on the founding board of ARIA but had to step down when the incoming prime minister Kier Starmer took the unusual step of making him a Baron and appointing him as Science Minister.⁶⁵

Ilan Gur

Ilan Gur, recruited as the first Chief Executive of ARIA, is the stand-out Silicon Valley American in an agency that spends a lot of time looking to Silicon Valley and America. Originally a physicist who worked on nanocrystals for solar power⁶⁶ Gur left academia to work at ARPA-E – the DARPA-like agency set up for high risk-high reward work on energy tech in the US. He then set up two startups and led activate.org which supports tech entrepreneurs. His appointment to ARIA was trumpeted as the Brit agency scoring a key Silicon Valley highflyer⁶⁷ to build stronger relationships with the tech elite, while his accompanying £455,000 per year remuneration package raised eyebrows.⁶⁸ While Gur is clearly smart and brings DARPA-like experience, a profile in Wired suggests his key role has been to lend a Silicon Valley geek cred to ARIA – including a trademark look of soft sneakers and t-shirts.⁶⁹ However, even the fat paycheck may not have been enough for Gur to leave Silicon Valley for too long. In July 2025 Ilan Gur tendered his resignation and he has now been replaced by Kathleen Fisher, another American, who previously led DARPA’s Information Innovation Office.⁷⁰

Box 3: ‘Metascience’, ‘Progress Studies’, ‘Effective Altruists’ and ‘State Capacity Libertarians’

The four ‘big beasts’ of Aria may have been the most visible driving forces of ARIA, but other powerful and ideological players have been lurking in the background. Four key ‘ARIA adjacent’ influencers—Peter Thiel, Tyler Cowen, Patrick Collison and Eric Schmidt of Google—have been actively building networks and creating the ideological context underpinning ARIA (see Annex 3 for more details about each of them).

‘Metascience’, the science of studying how science itself works, has emerged in the past decade as an important, often thoughtful and reflective field of social science and economics that includes rigorous research and experimental design work investigating how to change the research and development system itself. However, alongside the respectable broad church of metascience researchers a more utilitarian, libertarian and commercial strain of applied practitioners has also emerged, focused on how the research enterprise can be fine-tuned or re-engineered to improve commercial outcomes.

One such metascience thinker, venerated by Dominic Cummings, Ilan Gur and others, is Australian Quantum physicist Michael Nielsen. Nielsen argues that innovation funding processes need to move away from funding on the basis of consensus-oriented public values towards more controversial ‘high variance’⁷¹ funding proposals that might ordinarily be opposed by some or even most people. Dominic Cummings, who calls Nielsen “one of the handful of most interesting people I’ve ever talked to,”⁷² proposed Nielsen to head ARIA but Nielsen reportedly dropped out of the recruitment process “because he was worried he would not be free to run the taxpayer-funded agency as he wished.”⁷³

Nonetheless ARIA’s leadership continues to use Nielsen’s language of ‘High Variance’ as a justification of their funding method. Ilan Gur told the UK parliament “I should be able to poll a set of experts, once we launch this programme, to ask them what they think. If they all think it’s brilliant, we’ve done something wrong, because it’s likely to be happening anyway. If they all think it is ill conceived and will never work, we’ve done something wrong, because it’s probably just a bad idea. But if I get a variance—if half of them think it’s brilliant and half of them think it’s a total waste—we may be on to something, so it’s worth taking a shot.”⁷⁴

An even more simplistic and ideologically loaded version of ‘metascience’ has emerged in the past few years under the name ‘Progress Studies’ which purports to try to identify research funding structures that will accelerate ‘progress’ (defined crudely to favour technological and economic progress rather than social progress). Progress Studies emerged from Patrick Collison and Tyler Cowen’s article “We need a new science of Progress”⁷⁵ and was enthusiastically embraced by tech transhumanists known as the ‘Effective Altruist’ (or EA) movement. EA proponents, who count leading Silicon Valley figures as adherents, argue that ultra-rationalist modelling can choose social or technical interventions that maximize ‘good’. Well-known EA leaders have included the now imprisoned crypto billionaire fraudster Sam Bankman-Fried of whom ARIA chair Matt Clifford has also written approvingly.⁷⁶ Clifford, who has spoken at EA events⁷⁷ and shares EA concerns about the supposed existential risk of AI, is loosely connected with the EA network and with the Progress Studies movement leaders specifically.

In May 2024, in response to an EA breakaway movement ‘Effective Accelerationism’ or ‘e/acc’, Matt Clifford tried to introduce his own version with a buzzphrase

he called ‘def/acc’ (Defensive Accelerationism). He described this as being “about building technology to protect us from the biggest threats we face – everything from pandemics and cybercrime to powerful AI and nuclear war. It’s the idea that the most powerful solution to technological risk is often more technology.”⁷⁸ Clifford announced that his company Entrepreneurs First would be running a def/acc accelerator programme supported by Eric Schmidt, former CEO and Chair of Google; Kate Bingham, former Chair of the UK Vaccine Taskforce (and ARIA Board member); Jack Clark, co-founder of Anthropic AI; and Patrick Vallance, former Chief Scientific Adviser to the UK Government, amongst others.⁷⁹

One person driving the ‘Progress Studies’ movement forward the most forcefully has been EA follower Jason Crawford. His ‘Roots of Progress’ organization had its first meeting at Peter Thiel’s ‘The Founders Fund’⁸⁰ and is motivated by Peter Thiel’s and Tyler Cowen’s concerns about ‘The Great Stagnation’. It holds a high profile annual ‘Progress conference’ which in October 2025 featured Ilan Gur (then CEO of ARIA), Tyler Cowen, Sam Altman (of OpenAI), Eric Gillam and Tom Kalil of ‘RenPhil’ and others.⁸¹ Prominent libertarian Ron Bailey of Reason magazine sketches out how this ‘Progress Studies’ movement (which has a MAGA-like focus on protecting ‘American Dominance’) links to other more familiar right wing initiatives: “The contours of the new progress movement stretch from the Human Progress project at the libertarian Cato Institute to the ‘eco-modernist’ initiatives at the Breakthrough Institute and the Pritzker Innovation Fund. Four relatively new groups at the forefront of the ‘pro-progress’ forces are The Roots of Progress, the Institute for Progress, The Progress Network, and Works in Progress. Together, they are – as The Progress Network puts it – “building an idea movement that speaks to a better future in a world dominated by voices that suggest a worse one.”⁸²

Significantly this new tech titan-supported Progress Studies movement, funded by ideologues such as Peter Thiel and Tyler Cowen, doesn’t just aim to speak to the right wing. Its core interests are to stimulate a wider push back against a precautionary approach to technology and to dismantle restrictions on risky technologies including through the establishment of ‘hands-off’ funding schemes such as ARIA. Progress Studies movement libertarians have moved away from the idea of just shrinking government to proposing that government (and its funds) should be captured by industry to organise and pay for risky ‘deep tech’ research on behalf of industry – a stance described by Tyler Cowen as ‘State Capacity Libertarianism’.⁸³ This idea is that government should pay the costs of trying to create new technology waves that can then be capitalised on by private tech investors, which is an appealing pitch for Silicon Valley at a time when the venture capital ecosystem is almost entirely taken up trying to fund the multitrillion dollar build out of AI infrastructure. It turns out that even libertarian tech titans are more than happy for taxpayer money to take up some of the slack on early-stage development costs, especially if there are no strings attached. ARIA appeals directly to this approach.

In the UK, alongside ARIA, the Progress Studies movement is aggressively targeting Starmer’s Labour with new political formations such as ‘The Centre for British Progress’ or ‘Looking for Growth’ (a political network of young entrepreneurs which Dominic Cummings is now partnering with). Lawrence Newport, the founder of ‘Looking for Growth’, previously ran a YouTube channel called “In Pursuit of Progress” and is active on Twitter under the name @pursuitofprog. Looking for Growth’s main activity so far is to promote a draft of a parliamentary bill that “fast-tracks the building of Nuclear Power Stations, Overhead Cables and Data Centres.”⁸⁴



PART 2:

HOW DOES ARIA WORK?

“The real obstacle is not a need for breakthrough technologies though technology could help. As Colonel Boyd used to shout, ‘People, ideas, machines – in that order!’”
– Dominic Cummings⁸⁵

‘We fund people, then projects’ is the much-repeated mantra of ARIA drawn from the ‘DARPA-model’ that the organization venerates. In practice this means that the core of ARIA is presented as being not so much the technological areas they pursue but rather a team of much vaunted ‘Programme Directors’ (PDs) supposedly recruited for their technical brilliance, who are then mentored and supported to design breakthrough funding streams known as ‘Opportunity Spaces’. “I kind of want people to say that they want to be an ARIA program director the same way that they say they want to be a Premier League footballer,” says ARIA Chair Matt Clifford to emphasize how highly the agency prizes these ‘geniuses’.⁸⁶

At the heart of each ‘Opportunity Space’ is meant to be a big idea or ‘thesis’ which the Programme Director then invites research teams to pitch to address. According to ARIA’s theory of change these Programme Directors are the technical visionary geniuses who will imagine fertile new areas for invention and then be resourced to make them become real, and they also control funding decisions for their Opportunity Space. At the time of writing, ARIA had recruited two ‘cohorts’ of Programme Directors⁸⁷ – 16 individuals – who in turn have

defined 14 ‘Opportunity Spaces’.⁸⁸ Within each of these the Programme Directors then define more targeted research programmes which issue calls for proposals as well as inviting teams with related ideas to apply for ‘Opportunity Seeds’ – funding for related but different ideas. Teams who apply for ARIA funds are known as ARIA ‘Creators’. Each Programme Director can also be supported by Programme Specialists and technical advisors.

For an example of how this structure works in practice, ARIA’s first cohort of recruited Programme Directors included Angie Burnett, a British plant biotechnologist who had worked at the UN’s Food and Agriculture Organization (FAO) to promote GM crops. Burnett seemingly came into ARIA expecting to set up an ‘Opportunity Space’ about food security but in working with ARIA’s leadership settled on the ‘big idea’ of seeing plants as a programmable platform for synthetic biology (which so far mostly works with microbes).⁸⁹ The ‘Programmable Plants’ opportunity space then invited proposals for a first set of research on how to make ‘synthetic plants’, giving £62.4 million to an initial seven teams investigating different approaches to making synthetic chromosomes in potatoes. She also granted a small amount to two teams looking at social and communication issues around GM crops and up to £7 million to an additional 14 teams also working in different areas of plant synthetic biology (as ‘Opportunity Seeds’ funds) (See ‘Case Study 2: Synthetic Biology’s programmable plants’ for more detail).

Besides the core group of Programme Directors, who scope and support ‘moonshot’ research, ARIA also tries to translate that research into commercial activity. ARIA has a Board and Advisory Committee⁹⁰

composed of well known ‘deep tech’ industrial players including Sir Demis Hassabis of Google DeepMind, Patrick Collison of Stripe and Strive Masiyiwa of Cassava Networks. ARIA also partners with (and funds) ‘Activation Partners’ – nine entrepreneurial-focused and corporate outfits that work with the Programme Directors and Creators to shepherd inventions over to commercial investors.⁹¹ ARIA leans hard on ‘startup’ mythology, seeing its researchers as potential ‘founders’ of companies and generally structuring intellectual property arrangements so that patents and other IP stay with the ‘creators’ in order to build commercial ventures and win investment. Although ARIA has an Ethics and Social Responsibility Committee (ESRC), a sub-committee of the board, ARIA’s annual reports indicate that the committee only met on one occasion in ARIA’s first two years.⁹²

What does ARIA fund?

ARIA’s focus is on what tech investors call ‘Deep Tech’ – a set of platform technologies such as Artificial Intelligence, biotechnology, robotics, cryptofinance and climate geoengineering that are sometimes identified as the next wave of disruptive technologies or what the World Economic Forum calls ‘the Fourth Industrial revolution.’⁹³

“A single breakthrough is all it would take for Aria — and the UK — to make history, Gur says...We are asking ourselves all the time, what will be our ChatGPT moment, what will be our Ozempic moment?”⁹⁴

Ilan Gur, then CEO of ARIA

Box 4: ARIA and intellectual property

ARIA’s approach to intellectual property (or IP) is, by default, to allow funding recipients to own the resulting IP, although with some caveats.⁹⁵ Its approach to geoengineering research is treated somewhat differently in this respect, as in others, but not all that differently. There is a binding ‘Future Proofing our Climate and Weather Intellectual Property Pledge’ which recipients are required to sign up to, so that all experimental data is “made public for scrutiny by the global scientific community” and “all patents are free for research”. In other words, patents are still permitted, but with more strings attached.⁹⁶

The narrative that ‘genius’ Programme Directors are the ones strategically guiding ARIA may be overstating the case. ARIA’s leadership appear to exert a strong influence on programmes both through the initial selection of Programme Directors (PDs) and then by the way in which these PDs are coached, accompanied and encouraged to frame their Opportunity Spaces. ARIA leadership claims they help Programme Directors develop good ‘taste’ for the right thing to fund.⁹⁷ This echoes a principle first articulated by Dominic Cummings about ARIA relying on people of good ‘taste’ but as has been observed in relation to ARIA ‘taste’ could also have darker connotations. As Conservative MP Katherine Fletcher pointed out, “taste is one of those subjective human things that we need to be careful and worry about when concentrating great power in a small number of hands.”⁹⁸

It is not clear at this point how long an Opportunity Space will run for or how many PDs or cohorts ARIA intends to ultimately have at one time, although ARIA has explained that PDs have term limits of three to five years to preserve “independence and urgency”.⁹⁹ Some Programme Directors report they are ‘on sabbatical’ from large commercial companies. With a built-in turnover of PDs, continuity and long-term strategy therefore seems to rest somewhere other than the ‘genius’ layer.

The ‘wave’ metaphor, drawn from Soviet economist Nikolai Kondratiev’s theory that economies undergo long technological waves¹⁰⁰ is especially important. ARIA aims to act as a pre-commercial space that can then be exploited by private venture capital (VC). ARIA’s first CEO, Ilan Gur, described VC investors as being like surfers trying to ‘catch a wave’ of tech trends: “You’re [VCs are] trying to find the trends you can hop on and surf, so that you can maximize the ROI of your investment in a very concrete, direct way. I see [ARIA’s] job as more of putting the energy in to create the wave...Right now everyone looks out and just sees flat water, but we believe that by pushing a little bit here or there we can start to build a wave. And if we can catalyze the formation of a wave that’s big enough in one of these spaces, then actually that’s going to catalyze all the VCs to want to jump on that wave...to want to invest in companies.”¹⁰¹

ARIA’s current 14 Opportunity Spaces are listed in Annex 1. In Dominic Cummings’ original writings on ARPA three themes in particular were expected to dominate this wave-making by ARIA: Biotech, AI and climate tech. However, the twin events of the COVID pandemic and the release of ChatGPT in the early 2020s appear to have initially shifted the balance towards a bigger emphasis on biotech and AI. In particular, the role of Oxford University and

AstraZeneca in delivering a DNA vaccine during the COVID pandemic¹⁰² and the role of London-based Google DeepMind as the originator of the ‘Transformer’ neural network architecture that underpins the current generative AI boom¹⁰³ has also helped to drive these twin foci. A wider focus on climate and biodiversity is however still prominent among the Opportunity Spaces. According to the ARIA method, each Opportunity Space is supposed to be “big if true”¹⁰⁴ (that is, it’s the researcher’s job to prove a theory) and also not already well covered by other funding programmes elsewhere. Despite the rhetoric of ‘blue skies’ and ‘thinking outside the box’ ideas, so far much of what ARIA is funding (eg Synthetic Biology, crypto, AI, robotics) is similar to other ‘deep tech’ venture funding. For example, some of the themes that recur across the current Opportunity Spaces include:

- Making everything ‘programmable’, from programmable polymers for materials, to programmable plants to programming the brain or earth systems.
- Creating cyber-physical systems, based on the convergence of the digital and real worlds into complex hybrid digitally-controlled systems.
- Enabling transhuman embodiments and enhancements, with new kinds of sensing and robot bodies, and by engineering the immune system and digitally stimulating brains.

Box 5: Deep tech? what’s that?

‘Deep tech’ is a tech investor buzzword for more emerging and speculative technology fields. According to UNDP’s (overly optimistic) definition “Deep tech refers to the cutting-edge and often disruptive technologies that are built on profound scientific discoveries, engineering innovations, or advancements in research areas that have the potential to radically transform industries, economies, and lives. Unlike other technological innovations that might be more incremental, deep tech often signifies a paradigm shift in how problems are solved. Almost anything used in today’s world had its roots in deep tech at a certain point: electricity, the telephone, the Internet, cars, planes, etc.”¹⁰⁵

Why is ARIA exempt from normal rules?

“To achieve its goals Aria has been freed from the shackles of government red tape. The agency was created by an act of parliament which meant it could not be reviewed by the government for ten years, would not be subject to normal civil service pay caps, and, controversially, is not subject to the Freedom of Information Act.”

The Times Profile of ARIA¹⁰⁶

“ARIA may do anything which appears to it to be necessary or expedient for the purpose of, or in connection with, the exercise of its functions”

ARIA Act, para 17¹⁰⁷

As the ARIA Act progressed through the UK Parliament it became clear the agency was being designed to escape the scrutiny and oversight expected of other funding bodies which could enable the bending of ethics norms. Most notably ARIA, despite being an agency of the UK government and dealing with controversial technologies, was deliberately exempted from having to answer Freedom of Information (FOI) requests;¹⁰⁸ was intended to be exempt from ordinary government procurement rules¹⁰⁹ and will have “day-to-day operational independence” to the extent that intervention by the Secretary of State is mentioned only in terms of stepping in if there is a need to

protect national security.¹¹⁰ ARIA has been given broad powers to accept or borrow different types of money and gifts, to acquire land or set up companies,¹¹¹ and the way in which ARIA has been set up as an ‘entrepreneurial agency’ creates a culture in which industrial interests that would ordinarily be seen as conflicts of interest are generally encouraged. This all raises accountability concerns in an institution handling £1 billion of taxpayer money. ARIA was set up at a time when corruption and cronyism in handing out government contracts had been a hot button issue in the UK (eg around multimillion pound contracts for COVID Personal Protective Equipment) yet Cummings and his Special Advisor James Philips claimed that it was exactly the experience of red tape around COVID procurement rules that made them push to exclude ARIA from such laws. In a later interview Philips explained “We had this test of, ‘Let’s say ARIA was dealing with COVID. Will it be able to do this thing? Will it be able to just buy these tests, assemble the right experts and oversight, and run a demo of them really quickly?’”¹¹²

This aversion to rules, oversight and transparency is at least partly rooted in the mythology of DARPA as supposedly giving total agency to individual ‘genius’ programme managers but traces firmly back to Dominic Cummings’ obsession with clearing away bureaucracy of all kinds. His disdain for democratic oversight processes is well known. In drawing lessons from DARPA Cummings noted that “Progress required subverting rules/laws”¹¹³ and he later told parliament that ARIA needed “extreme freedom” from the “horrific bureaucracy” of Whitehall and other research bodies or otherwise wasn’t worth doing.¹¹⁴ In a parliamentary hearing Cummings was challenged about whether these exemptions and “extreme freedoms” might lead to “extreme cronyism”¹¹⁵ Cummings response was to double down, telling the story of a precedent, the wartime Manhattan project in the US (for a nuclear bomb) which used up significant government funds with almost no oversight: “General Groves ran

round the country handing out something like 2% of US GDP, often with only a handshake. There were absolutely no lawyers involved and no processes at all.”¹¹⁶

During parliamentary scrutiny other limp arguments were made that subjecting ARIA to Freedom of Information laws would deter individual Programme Directors from making the ‘risky’ decisions that a ‘high risk’ agency required. For example: “In terms of the level of transparency” explained Professor Philip Bond in one committee hearing “transparency is a good and wonderful thing in most areas, but if you are asking people to go out on a limb to really push the envelope, I would assert that there is an argument, which has some validity, that you make it psychologically much easier for them if they do not feel that they are under a microscope.”¹¹⁷ The then Shadow Secretary of State for Business, Energy and Industrial Strategy (BEIS) Ed Miliband (now Secretary of State for Energy and Climate Change) questioned whether it was wise to “let a bunch of buccaneering individuals do what they liked”¹¹⁸ and that “I do not think there is justification for ARIA’s blanket exemptions from FOI”¹¹⁹ but his political party, Labour, hasn’t reversed that decision since coming to power. Labour Science Secretary Lord Patrick Vallance asserted that “We have no plans to bring ARIA into the scope of the FoI Act. ARIA is a unique organisation with unique freedoms”. He also made the rather hyperbolic claim that “the amount of information that ARIA puts in the public domain is more than that of almost any other body in the world.”¹²⁰

Although ARIA remains exempt from Freedom of Information rules, investigative journalist group ‘Democracy for Sale’ was able to establish, through a court case, that

ARIA was not exempt from other disclosure laws regarding environmental matters. However, when Democracy for Sale requested details about ARIA’s ‘Scoping our Planet’ programme they were bizarrely informed by ARIA that ‘Scoping Our Planet’ (a biodiversity data programme) was not ‘environmental’ so they didn’t have to release anything.¹²¹

“...there are obvious shortcomings. Others have mentioned the exclusion from freedom of information. There is no convincing explanation advanced for that, though the ‘burden’ is referred to. But a well-run organisation ought not to find it a burden, particularly as we were promised in the statement of policy intent that the agency ‘will be an outward facing body which will proactively provide information about its activities’ – except when people ask.” Lord Davies, during a 2021 debate on the ARIA Act¹²²

[See Annex 1 for more detailed information about ARIA’s Opportunity Spaces.]

Box 6: ARIA ‘How to’: Digging down into the details

ARIA is not covered by the UK’s Freedom of Information Act, although it is obliged to provide environmental information under the Environmental Information Regulations (2004) (EIR) (even if it has had to be pushed to comply by the Information Commissioner’s Office²³). Perhaps as a result there is more information on ARIA’s website than first meets the eye. Here are some tips, current at the time of writing, about how to find detailed information about specific projects and ARIA’s procurement plans.

Tip 1: How to find ARIA’s “published procurement timeline”

This is updated every three months and is a good place to check up on recent activity. Go to the bottom of the website, and click on ‘Reporting and Policies’, then ‘Transparency Data’.

Tip 2: How to find specific programme and project data

Generally, go to the Opportunity Space you’re interested in, then the Programme (if there is one), then the project (if there is one). Keep on scrolling down as far as you can go and clicking through boxes with names like ‘Exploring’ and ‘Discover more’ and ‘+’.

For example, in ‘Scoping Our Planet’ you can find details about individual projects this way. In ‘Engineering Ecosystem Resilience’ you can find out about current calls for proposals for the new ‘Accelerated Adaptation’ programme. In ‘Future Proofing Our Climate and Weather’ this eventually takes you to ‘Controlled, small-scale outdoor experiments’ (in this last case if you don’t have time for all those steps, click here <https://www.aria.org.uk/opportunity-spaces/future-proofing-our-climate-and-weather/exploring-climate-cooling/funded-projects/?tabId=controlled-outdoor-experiments> (as accessed 25 February 2026)).

Tip 3: See the answers that ARIA has published in response to public requests made under Environmental Information Regulations legislation

Go to the bottom of the website, and click on ‘Reporting and Policies’, then ‘Transparency Data’, then scroll down (a long way) until you reach ‘Environmental Information Regulations (EIR) Responses’.

Tip 4: Submit your own EIR request

ARIA provides details about this: <https://www.aria.org.uk/contact/>

Case Study 1: Geoengineering

The plans by ARIA to spend £56.8 million¹²⁴ (around US\$75 million) on a multi-year solar geoengineering programme that includes five outdoor experiments sent shock and surprise around the world when it was announced in early 2025. Noting that this amounts to the largest commitment by a government to fund so called ‘solar radiation management’ (SRM) research by far, the leading climate scientists associated with the Solar Geoengineering Non-Use Agreement¹²⁵ warned “The ARIA

programme constitutes a new escalation in the push to normalize this dangerous set of technologies.”¹²⁶ On the face of it this announcement appears to put the UK government in contravention of an international moratorium on solar geoengineering research agreed through the UN Convention on Biological Diversity in 2010 that was reaffirmed in 2024 at the CBD’s COP16 meeting in Cali, Colombia.¹²⁷

Specifically that moratorium agreed “that no climate-related geo-engineering activities...that may affect biodiversity take

place, until there is an adequate scientific basis on which to justify such activities and appropriate consideration of the associated risks for the environment and biodiversity and associated social, economic and cultural impacts, with the exception of small scale scientific research studies that would be conducted in a controlled setting in accordance with Article 3 of the Convention, and only if they are justified by the need to gather specific scientific data and are subject to a thorough prior assessment of the potential impacts on the environment.”¹²⁸

In parliamentary debate the then UK Under-Secretary of State, Kerry McCarthy, seemed to be trying to distance the UK Government from ARIA’s geoengineering activities by emphasizing that ARIA “has complete autonomy on its project choices, which goes to the point about whether that is the best use of public money, as ARIA is responsible for its own choices”¹²⁹ Science Minister Peter Kyle even admitted that he was advised by his officials not to associate himself with ARIA’s geoengineering programme. However Kyle in fact doubled down making it clear that he was gung-ho in support of geoengineering experiments: “I wrote back saying I want to be all over this,” Kyle said at a summit held by ARIA “I want to nail this to my mast—if there’s ever anything in the media about this, I personally want to be out there doing the interviews on it.”¹³⁰

There are currently two Opportunity Spaces in ARIA that speak to the question of geoengineering the climate.

Firstly, the ‘Future Proofing our Climate and Weather’ Opportunity Space with its

‘Exploring Climate Cooling’ programme is the activity that has already attracted some public concern. Arguing that it may be necessary to respond to climate tipping points, the programme has a multi-part funding agenda which supports five different outdoor experiments, as well as the development of experimental monitoring equipment and protocols, geoengineering modelling studies and studies exploring ethics and communications.¹³¹

This programme, led by Scottish electro-chemist Mark Symes, has its own seven person ‘Oversight Committee’¹³² For a long time it seemed that this was without equivalent anywhere else in ARIA, but the ARIA website says it will establish a similar committee for the new ‘Accelerated Adaptation’ programme.¹³³ It is also accompanied by extensive documentation including publication of grant agreements and FAQs outlining how ARIA expects to undertake “careful and responsible research” under “rigorous oversight”. The ‘Future Proofing our Climate and Weather’ Opportunity Space also takes steps to ensure that patents in this area must allow access to information for research purposes – but it still allows researchers to take out patents, in keeping with ARIA’s overall ethos.

Overall, the main thing to note when reviewing all communications from the ‘Future Proofing our Climate and Weather’ Opportunity Space is just how much of an odd one out it is amongst everything else that ARIA does. All other ARIA programmes and organisational communications play up ARIA’s high-risk gambling nature and how its researchers have free reign. They boast that ‘Creators’ can retain intellectual property, try to match outputs



with investors and companies and justify its activities in terms of imagined billion- or trillion-dollar commercial opportunities (even the Opportunity Space on 'Engineering Ecological Resilience' justifies its existence in terms of financial opportunities in biodiversity markets). What is clear is that the 'Exploring Climate Cooling' programme is being carefully curated to look different – perhaps in an effort to be seen to meet the explicitly precautionary requirements of the CBD moratorium whose ethos is 180 degrees counter to the free-wheeling, rule-bending spirit of ARIA. Which begs the question: why is this programme even in ARIA?

One of the key questions an ARIA Programme Director is supposed to ask is whether the work being proposed is already going on or supported somewhere else in the research ecosystem.¹³⁴ In the case of the 'Exploring Climate Cooling' programme it certainly is. A significant number of teams awarded grants are existing pro-geoengineering researchers and outfits – a group that is known as 'the geoclique'¹³⁵ – already funded by well-established big climate tech funders such as The Simons Foundation, the LAD Climate Fund, Quadrature and Silver Linings¹³⁶ – and existing recipients include The Degrees Initiative, The Center for Future Generations and high profile geoengineering scientists like Doug McMartin and Hugh Hunt. Some of the ARIA funding is even to pay for experiments that have already begun and are underway. In addition, in the case of the Arctic Ice Thickening Project, the description as presented on ARIA's site does not mention that the listed investigators are already collaborating with private geoengineering companies such as Arctic Reflections¹³⁷ and Real Ice¹³⁸ who say they hope to turn a profit on these technologies and "to seed an ice growing industry" (Simon Woods, Executive Chairperson of Real Ice).¹³⁹ All evidence points to a conclusion that the existing solar geoengineering research programme already underway and organised by private donors has been deliberately collected together and placed

in a government-run setting so that it can look more 'responsible' – albeit in a programme handily shielded from the prying eyes of Freedom of Information requests.

The second geoengineering-related Opportunity Space is called 'Scoping Our Planet'.¹⁴⁰ This seeks to develop models and technologies to monitor when the climate system crosses over key 'tipping points' including the melting of the Greenland Ice Sheet (GrIS) and the potential collapse of the adjacent Subpolar Gyre (SPG) circulation. This includes a 'Forecasting Tipping Points' programme, which aims to develop the technological means to ascertain progress towards such key tipping points. 'Scoping our Planet' will also attempt to develop perpetual flight platforms that use atmospheric energy to stay in the upper atmosphere (the stratosphere) for more than a year. Such platforms, known as HAPS (High Altitude Pseudo Satellites) are presented by ARIA as platforms for weather monitoring but could also prove useful for stratospheric geoengineering since continuous delivery and monitoring of geoengineering technologies is a challenge. More broadly, having the scientific capacity to determine if a tipping point is being reached could rhetorically offer ARIA the opportunity to claim that there is "an adequate scientific basis on which to justify" geoengineering trials – necessary to circumvent the CBD moratorium.

The programme exploring 'Cooling our Climate' also leans heavily into a convenient narrative that geoengineering could proceed on a 'risk vs risk' basis, where the unknown risks of geoengineering are weighed against the risk of climate 'tipping points' being crossed. Like the 'Future Proofing our Climate and Weather' Opportunity Space, the 'Forecasting Tipping Points' programme is not being justified on the usual economic, high risk-taking, commercial opportunity grounds that everything else in ARIA is supposed to be predicated on – suggesting the possibility of an intentional link between the two areas of work.

Case study 2: Synthetic Biology's programmable plants

Eric: Is there any other technology you spend a lot of time thinking about?

Ilan: I don't know. I think synbio comes up a lot

An Oral History Interview with ARIA CEO Ilan Gur¹⁴¹

Synthetic Biology (or 'synbio') refers to the set of new biotechnology techniques and approaches in genetic engineering that ARIA is trying to frame as engineering presumably to make it more publicly acceptable. Often referred to by the UK Government as 'Engineering Biology',¹⁴² synbio encompasses gene-editing, the creation of synthetic cells, DNA and other living parts, and the redesign of biological molecules and systems.

Even though it remains highly controversial, Synthetic Biology has come to occupy an important role in the hopes and imagination of those responsible for UK science and industrial policy. Former Science Minister David Willets named it one of the 'eight great technologies'¹⁴³ that he believed would propel the UK economy to further growth. Now part of the SynBio-Ven venture capital group¹⁴⁴ and head of the UK Government's new 'Regulatory Innovation Office' (established to strip back regulations on new technologies) Willets is actively focusing on regulatory reforms to ease the way for Synthetic Biology products to enter the UK market and environment.¹⁴⁵ More broadly UK science policy-makers have consistently over indexed on funding biotechnology for decades in the hope that the next great breakthrough drug or other bioproduct might come from the UK, thereby generating wealth. As a result of this over-focus on biotech research, system experts have argued that the UK is stuck in a 'biomedical bubble' that artificially props up a few big UK-based private

pharmaceutical giants (GlaxoSmithKline and AstraZeneca) with declining results.¹⁴⁶ For the architects of ARIA at least three factors have contributed to doubling down on synbio as the bold bet that might deliver what Ilan Gur has called the next "Ozempic moment":¹⁴⁷

1. The COVID pandemic and the mostly successful fast-tracking of a profitable 'UK' vaccine by AstraZeneca is held up as a recent model for what ARIA may be able to replicate in terms of 'moonshot' outcomes.
2. The UK's Brexit break with the European Union means that Britain no longer has to abide by the EU's precautionary regulations in genetic engineering.
3. The academic success (and Nobel Prize win) of London's Google DeepMind – particularly the Alphafold programme which uses AI to predict and then create new protein folding arrangements.¹⁴⁸ This AI-driven biotech is seen as the next industrial wave of synbio.

Only a few years into ARIA's operation there are already several Opportunity Spaces featuring some aspect of synbio. These range from the very well-trodden path of using synbio to create materials (so called 'industrial biotech') through to trying to alter the innate immune system of human beings (effectively human enhancement). The Opportunity Space on using synbio to engineer the ecological resilience of ecosystems¹⁴⁹ fits closely with agendas for biodiversity financialization and also the recent push to try to claim that genetic engineering can be useful for conservation.¹⁵⁰

The highest profile of the synbio Opportunity Spaces is ARIA's Programmable Plants Opportunity Space which is shaped by Programme Director and plant biotechnologist Angie Burnett – a former policy advisor on GM crops for the UN Food and Agriculture Organization.¹⁵¹ This includes the £62.5 million Synthetic Plants programme which attempts to reimagine a plant as a genetically

programmable platform – much as commercial synthetic biologists reengineer microbes to perform novel functions via adding DNA ‘programmes’. The argument made by ARIA is that synbio allowed a COVID vaccine to be developed and deployed within a year (rather than ten years) and enabling rapid genetic engineering of plants as a plug-and-play platform will similarly allow breeders to respond swiftly to climate stresses and other food emergencies.¹⁵²

The underlying assumptions on which the Programmable Plants Opportunity Space is founded are almost identical to the ag biotech industry’s current public relations talking points. A ‘core belief’ is reported as “Today’s agricultural system is struggling to address the twin challenges of an unsustainable food supply and an unstable climate.”¹⁵³ Yet this fails to acknowledge that it is specifically the industrial food system that is unable to address these challenges or that agroecological and diverse peasant agriculture is enabling rapid adaptation in a more sustainable manner without genetic engineering. Currently this Opportunity Space is focused on gene editing and the modification of potatoes. Operating firmly within the industrial ag paradigm ARIA researchers seem disinterested in understanding the traditional knowledge and technologies or sacred role of the indigenous Latin American plant that it is trying to render ‘programmable’ or exploring non-synbio routes to plant breeding.

Again echoing the existing technological pathways being explored by big agrotech firms, the concept note for the Opportunity Space names exactly the suite of technological research and development targets that big agbiotech firms are already engaged in – eg gene editing, transient modification, putting GM microbes in the soil, and modifying the nutrient profile of fruit and seeds.¹⁵⁴ Moreover the already existing UK Research Institute (UKRI) has a priority research area that is incredibly similar, which also focuses on translation to commercial use: “Engineering biology for Food Systems: Delivering a more productive,

sustainable and secure agriculture and food sector.”¹⁵⁵ Far from pushing bold new cutting edge frontiers ARIA’s agenda seems more about subsidizing existing GMO work. Once again, the real value might be in enhancing the UK’s ‘offering’ to tech investors – especially at a time when the post-Brexit deregulation of gene edited crops means that engineered plants can be trialled with little oversight, with the UK seen as a regulatory light touch in comparison to the rest of Europe.

It is instructive to contrast the Programmable Plants space with the Exploring Climate Cooling programme. Like geoengineering, GM crops have been incredibly controversial and subject to massive public opposition, particularly in the UK. With this in mind there is a small amount of funding to explore public attitudes¹⁵⁶ – but seemingly more focused on engineering acceptance since the description focuses on “why advanced genetic work in plants is worth doing, [and] who might benefit from it,” rather than exploring risks, harms or justice questions. Unlike the geoengineering topic (see above) there seems to have been no attempt to set up an oversight committee or to place restrictions on commercial exploitation and patenting. Here the overarching tone is speed and commercial opportunity.

However, a new synbio programme has recently been set up under the ‘Engineering Ecosystem Resilience’ Opportunity Space, on ‘Accelerated Adaptation’ – and the fact that it might be even more controversial than Programmable Plants seems to be implicitly recognised by ARIA since it says that this programme *will* have an Ethical and Social Responsibility (ESR) Advisory Committee.¹⁵⁷ The programme aims to take biotech into the wild to prevent biodiversity loss – in other words to ‘solve’ problems that were caused by industrialisation in the first place. It aims to do this by “leveraging breakthroughs in genomics, robotics, and AI”¹⁵⁸





PART 3:

SOME NARRATIVE FOUNDATIONS OF ARIA AND WHAT THEY MISS



Even though it is hidden from Freedom of Information requests, ARIA has been prolific in its public communications, telling a very carefully crafted story about itself and what innovation (or ‘invention’) means in this moment in history. Below are some narrative elements and assumptions underpinning the story that the ARIA leadership is telling, with an analysis of what is and *isn’t* being said.

‘High risk’ trumps precaution

Almost every telling of the ARIA and DARPA story is founded on the idea that ‘high risk’ is the only way to generate ‘high reward’. This frame is amplified by the use of techno-optimist language about ‘moonshots’, ‘big bets’ and telling the tale of how ‘breakthrough’ experimental vaccine tech (whether mRNA or Oxford/AstraZeneca’s engineered DNA vaccine) saved lives in the COVID pandemic. The association of ARIA with Kate Bingham, the Head of the UK Vaccine Taskforce in 2020, together with Patrick Vallance and Özlem Tureci (co-founder and Chief Medical Officer of BioNTech) as Advisors heightens this story of risk-taking paying off in moments of crisis. ARIA’s choice of controversial ‘risky’ technologies to pursue – including geoengineering, GM crops and brain-machine interfaces – further heightens this impression of a bold agency that is not afraid of risk.

Ironically the original DARPA conception of ‘high risk-high reward’ was rather more narrowly focused on financial risk rather than

the sort of risks that normally concern the public (eg health and environmental risks). DARPA-like agencies are definitely high risk in the financial sense since a great deal of public money will be spent on projects that may not deliver any outcomes. But there is a different sort of ‘high risk’ when it comes to perturbing the climate or altering plant genomes – a risk to health, fairness and life on earth, not simply a risk to public budgets. This conflation of financial risk with more existential forms of risks could be a deliberate rhetorical ‘bait and switch’ to harness understandable public and elite fascination with historic inventions such as the internet or satellite navigation whilst reducing resistance to emerging technologies that could pose new forms of harm.

What is clearly missing is the idea of precaution and the importance of the precautionary principle.¹⁵⁹ We do not hear from ARIA about the need for scientists such as biosafety experts, who listen out for telltale signs that something is not right with new technologies, or the importance of understanding that ecological systems need to be maintained in balance, or concern that we may see unexpected environmental effects from new technologies.¹⁶⁰ This controlled focus on genius breakthroughs also implies that there are no alternative pathways, or that existing pathways should be replaced by a focus on big technical fixes. Even the broad-brush story of saving lives via novel genetic COVID vaccines overlooks the equal success of conventional vaccines such as the Sinopharm COVID vaccine,¹⁶¹

the importance of social distancing and the social actions that were taken by everyday people to 'bend the curve' and minimise infection rates. It also hides the story of the side effects of the AstraZeneca vaccine which led to many countries refusing to purchase it and have since been acknowledged by the pharma company in court documents.¹⁶²

ARIA's narrative is effectively an attack against the precautionary principle and echoes a wider industry narrative that is attempting to replace the use of the precautionary principle in policies with a newly minted 'innovation' principle.¹⁶³ ARIA Advisor Patrick Collison's expressed frustration with "the promiscuous distribution of the veto system"¹⁶⁴ (i.e. democratic oversight) is an example of this anti-precautionary view which also downplays the democratic importance of consent (including public consent). It's echoed by Matt Clifford's argument that "You want to have as few veto points as possible"¹⁶⁵ which evokes the fundamental distaste for democracy expressed by Dominic Cummings, Peter Thiel and others. In a speech in October 2025 Matt Clifford presented the casting aside of precaution as patriotic nationalism: "The lesson from our history of British exceptionalism is that the mother of greatness is permissionlessness. You shouldn't need a licence to do all these things. We need to build a country where you can just do stuff. But we've gone in the opposite direction. We've broken our relationship with our history. We've broken our relationship with risk. We've broken our relationship with success."¹⁶⁶

Speed and disruption matter, care does not

The importance of speed and acting quickly repeats *ad nauseum* through the commentary and opinions of key people associated with ARIA, and within the agency it is also captured through another buzzword about being 'motion-biased'. In his original blog posts Dominic Cummings emphasized the importance of speed saying, "You can move very fast if you avoid bureaucratic cancers."¹⁶⁷ For Cummings the need for speed was justified

by the need to outrun the problems that new technologies themselves (including AI and CRISPR gene drives) were precipitating: "Not only is our destructive and disruptive power still getting bigger quickly – it is also getting cheaper and faster every year. The change in speed adds another dimension to the problem."¹⁶⁸ Matt Clifford's 'defensive acceleration' (def/dcc) approach tells the same story, that facing new threats requires doubling down and speeding up the very technologies that might cause those threats, to 'disrupt' them with new technical weapons.¹⁶⁹

What is missing from this narrative is the need to take the time to carefully understand the root causes of problems, particularly social, economic or cultural root causes, rather than acting reflexively and rashly. Indeed, notions of care, community, resilience and reciprocity seem notably absent in the ARIA narrative which is dominated by references to individual geniuses and lone scientific actors 'attacking' problems and unilaterally delivering brilliant panaceas as potentially commercially profitable services or products.

Echoes of empire

While ARIA's communications do not explicitly say 'we miss the British Empire, and we want it back' an underlying assumption is nostalgia for an age of former British greatness located at the height of the British Empire. This is a common thread from Dominic Cummings' blogs through to Patrick Collison's lamentations about industrial stagnation and is perhaps most apparent in Matt Clifford's speeches and writings. Asked about British history, Matt Clifford told an interviewer "I'm pretty patriotic... the history of Britain in the world, particularly its role in the industrial revolution... is very clearly to me the best thing that happened in the history of our species... It's part of why I was willing to do the ARIA thing."¹⁷⁰

In a later speech to the Looking for Growth movement Clifford went further, declaring that the UK used to be the richest country in the world and "that that wasn't an

accident: it was the result of British exceptionalism." According to Clifford "Britain created the modern world. This country gave us so much of what not only we, but the world, values today." Clifford has deliberately played down Britain's colonial crimes commenting "On history, we've come to see all our past achievements as tainted – the result of mere oppression or extraction. Of course there was some of that, but that's not where that long list of British accomplishments came from."¹⁷¹

Explicit in Clifford's rhetoric and also coded into the repeated language of ARIA aiming to reinvent the UK as a 'science superpower' is the notion of the small island nation regaining an outside geopolitical role that harks back to its former colonial power. The attempt to project a US-UK innovation 'Anglosphere' as the new 'English speaking' power block also echoes these assumptions of an entitlement to empire.

What is notably missing in ARIA's communications and framing so far is any recognition of Britain's post-colonial responsibilities and ongoing relationship with the Global South. Notably ARIA, alongside its multiple visible engagements with the US tech empire (and some other limited connections mostly with European, Asian and Anglosphere researchers), almost completely fails to acknowledge the existence of the British Commonwealth, to recruit South-based commonwealth Programme Directors or to offer support or solidarity to the nations and Southern communities that the UK is formally linked to and owes a debt to through its violent colonial history and legal institutions. Additionally, in its first two years, ARIA gave no grants to teams based in the developing world – a situation that only changed with the launch of the geoengineering funding space. Nor does ARIA's discourse attempt to locate or celebrate any part of what 'invention' and innovation means within the extensive diaspora communities who shape modern British culture, holding up instead US-oriented entrepreneurial bodies and elite institutions. The erasure of culture, diversity and lack of any post-colonial reckoning in a

primarily white-led agency fits strategically with ARIA offering itself in service to what is currently an 'anti-woke' US tech sector, particularly as personified by Peter Thiel, who authored "The Diversity Myth."¹⁷² This should be a matter of some embarrassment for the UK Labour Party which has striven to support and project diversity, equity and inclusion principles for decades.

'Great Man' theory

ARIA's entire thesis and theory of change is an embodiment of 'great man theory' – the idea that when genius individuals are given maximum freedom and privilege, they will bend the arc of 'progress' towards 'greatness'. The mythology of DARPA, Xerox Parc and Skunkworks, which ARIA leaders re-tell continually, is a veneration of entitled white male technocrats who confidently rode roughshod over accountability on account of their own sense of personal genius. Dominic Cummings' original blog pieces promoting a British ARPA spelled out that the institution should favour "great people not good people" and quotes DARPA's Programme Manager Taylor saying "Never hire 'good' people because ten good people together can't do what a single great one can do."¹⁷³

Cummings, Thiel, Cowen and others in the Progress Movement also invoke much-discredited IQ metrics which are connected with eugenics and race science (since IQ measures types of knowledge that biases elite white men).¹⁷⁴ For example in his original proposals for ARIA Dominic Cummings warned that "There is a terrible mismatch between the sort of people that routinely dominate mission-critical political institutions and the sort of people we need: high IQ (we need more people >145 (+3SD) while almost everybody important is between 115-130 (+1 or 2SD))."¹⁷⁵ Cummings also recommended race scientist Stephen Hsu to head up ARIA – leading to Scottish National Party MP Stephen Flynn having to explicitly make a call in the UK Parliament for anyone with eugenicist views to be barred as potential candidates for ARIA's Director.¹⁷⁶

“The ARPA model is that you have a very flat organisational structure. You have a director in charge of it and they have good taste in finding people. There is no alternative to this fundamental problem. You have to have someone in charge who has good taste in scientific ideas and in scientific researchers. That is how all these institutions worked. It is how General Groves operated with the Manhattan project. It is how Ruina found Licklider in the first place. It is how Licklider found Robert Taylor. It is how Robert Taylor created Xerox PARC in the 1970s. There is no

alternative ever discovered on earth to having funders with great taste in ideas and people.” Dominic Cummings

“I would gently point out that all the people you have just mentioned are blokes, and taste is one of those subjective human things that we need to be careful and worry about when concentrating great power in a small number of hands.” Katherine Fletcher MP

UK Commons Science and Technology Committee takes evidence from Dominic Cummings on the ARIA Bill – 17 March 2021¹⁷⁷ and Katherine Fletcher, MP, replies

Time and again UK parliamentary debates on ARIA, as well as the writing and speeches of Cummings, Clifford and other ARIA leaders name drop great ‘gentleman’ British inventors and scientists such as Alexander Graham Bell, Charles Babbage, Barnes Wallis, Tim Berners-Lee, Isaac Newton, Charles Darwin or Edward Jenner, with very few references to women scientists or inventors. Interestingly one woman whose story ARIA leadership does like to highlight is Hungarian biotech executive Katalin Karikó as an individual who bucked scientific scepticism about mRNA effectiveness and kept developing mRNA vaccines.¹⁷⁸ Once again, however, it’s a story of a heroic individual iconoclast working in a corporate setting.

A key part of the ‘great men’ myth connects with the importance of the image of the ‘entrepreneur’ for ARIA where the ‘great man’ is

also a commercial leader. Indeed, the name of Matt Clifford’s company ‘Entrepreneurs First’ is also by extension a slogan for the priorities of ARIA which not only valorizes entrepreneurial startup culture but invests significant amounts of its resources in a pipeline that remakes innovators as ‘founders’ effectively offering them as a product to commercial investors.

By contrast, teamwork and connection with communities or collective intelligence is somewhat invisibilized. DARPA itself emphasized reducing interdepartmental meetings or human collaboration and discussions to almost nothing – such that the atomized model was once described as “one hundred geniuses connected by a travel agent.”¹⁷⁹

The ARIA mythology also has individual geniuses lauded for setting direction, rather

than direction emerging from team discussions. While there is cross-fertilization amongst Programme Directors, they are each expected to captain their own Opportunity Space like an entrepreneur setting up their own company. Matt Clifford's Entrepreneurs First follows exactly this model supporting 'individuals' but not teams. The resulting commercialization model – around equity, intellectual property and creating 'unicorn' companies - invisibilizes co-operative, collective or commons ownership models, and community-based structures. Nor does the DARPA/ARIA model seem to involve participatory community knowledge development – such as the Science Shop movement or grassroots participatory innovation.

Purloining the idea of 'Progress'

The underlying analysis justifying the need for 'high risk-high reward' institutions is the concept of 'The Great Stagnation'¹⁸⁰ as espoused by Tyler Cowen, Peter Thiel and Patrick Collison (see Annex 3 about these 'ARIA-adjacent' individuals) Under this view of history, falling industrial productivity, including slowing growth using Gross Domestic Product (GDP) as a metric, is considered to be a sign that something called 'progress' is slowing. Technological adventurism and freeing technological geniuses from overbearing rules are meant to re-kickstart 'progress' and growth.

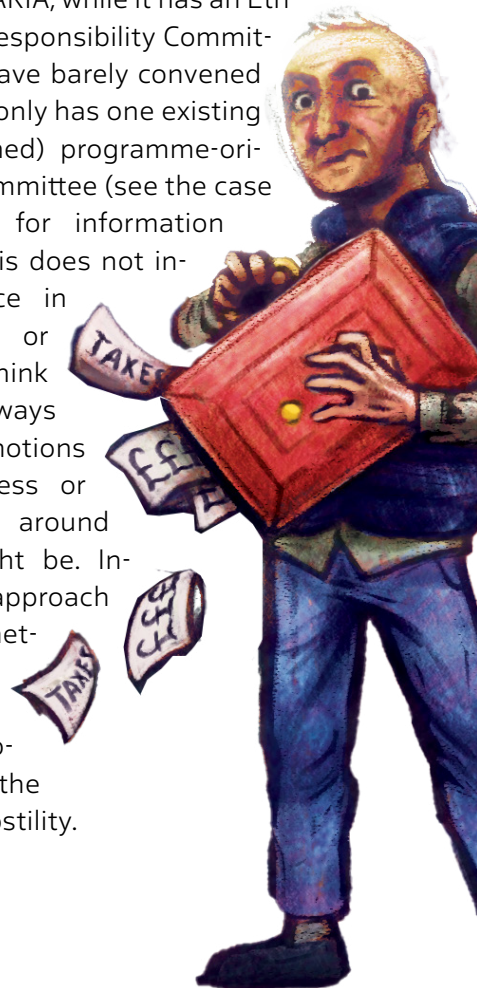
However, 'progress' as a concept has a very storied history. While so-called 'progressive' political movements have tied 'progress' to a meaning rooted in social improvement and the spread of rights and freedoms, progress originates from rigid ideas of being tied to material productivity, and the word was given a very commercial form in Victorian imagery, of factories and colonial civilizing effort.

Over the past century, post-modern and decolonial movements for ecology, feminism and Indigenous rights have picked apart the linear myths of progress; reemphasized

circularity, steady state economies and the value of plural cosmologies; and questioned the value of Gross Domestic Product (GDP) as a metric for human societal welfare. Movements such as the Degrowth Movement pose a fundamental challenge to the outmoded Victorian picture of progress.

Yet the 'Progress Movement' that ARIA appears to be tied closely to (see Box 3) is almost nothing to do with this humanistic and decolonial re-imagining. 'Progress studies' is doggedly materialistic, anti-ecological and aligned with notions of American dominance, militarism and corporatism for which Peter Thiel in particular is a leading spokesperson. A similar approach can be found in the UK. For example, ARIA-adjacent group The Centre for British Progress even goes as far as using Victorian iconography and artwork as the aesthetic for its Substack, 'The Progress Post', which is designed as a series of Victorian postcards complete with a stamp of the young Queen Victoria adding a strong nod towards British nostalgia for empire.¹⁸¹

It is telling that ARIA, while it has an Ethics and Social Responsibility Committee, seems to have barely convened that group and only has one existing (and one planned) programme-oriented ethics committee (see the case studies above for information about both). This does not inspire confidence in ARIA's ability or willingness to think in nuanced ways about societal notions of what progress or public values around innovation might be. Indeed, such an approach would be antithetical to the idea of backing 'high variance' controversial ideas in the face of public hostility.



ANNEX 1: ARIA's OPPORTUNITY SPACES



(ARIA's Opportunity Spaces can all be linked to from its home page, just scroll down.¹⁸²)

Biotech/Synthetic Biology

'Programmable Plants'

Big idea: Fully synthetic plants, with "genomes written from scratch" and "the delivery of new-to-nature capacities."¹⁸³ What if plants could be redesigned as a simpler flexible bioengineering platform for synthetic biologists to alter traits and create new crops more quickly?

Immediate Focus: Trying to develop synthetic chromosomes and chloroplasts in potatoes.

ETC's verdict: Really about industrial agriculture. We think this Opportunity Space is about trying to speed up and simplify the design and creation of GM crops for the plant biotech industry.

'Sculpting Innate Immunity'

Big idea: Vaccines apply biotechnology to harness the 'adaptive' immune system (specific responses against specific biological threats). What if we could engineer the 'innate' immune system (the general defences of the body) to either be stronger or weaker (e.g. reduce inflammation)?

Immediate Focus: Developing a new type of vaccine for the innate system called 'sustained innate immunoprophylactics' (SIIPs). These would improve the body's general immunity against all classes of viral threats.

ETC's verdict: Really about human enhancement, specifically creating a new class of pharmaceutical drugs to 'enhance' human health functioning.

'Bioenergetic Engineering'

Big idea: Biotech has learned to alter the information code but not the energy flow of cells and organisms. If we can change how cells store and transmit energy, we can power nano devices, attack aging and speed up carbon sequestration and nutrient cycling.

Immediate Focus: 'Precision mitochondria' – engineering the DNA of mitochondria (organelles in the cell that store energy) in vertebrates (animals).

ETC's verdict: Really about attacking degenerative diseases, making nano-machines and enabling carbon markets.

'Manufacturing Abundance'

Big idea: Synthetic biology lets us program the properties of materials and scale them for manufacturing.

Immediate Focus: Its 'Universal Fabricators' programme aims to use advances in protein engineering to develop scalable processes of materials that cannot currently be mass manufactured.

ETC's verdict: Really about the bioeconomy – using synthetic biology and AI to produce industrial commercial materials.

Artificial Intelligence (AI)

'Nature Computes Better'

Big idea: As the commercial demand for computation supersedes due to AI, industry needs new ways to design computer chips that are far cheaper and that use far less energy. The idea is that new chip designs can take inspiration from natural processes – either biological, neural or thermodynamic.

Immediate focus: 'Scaling compute' – teams will design either neuromorphic chips (which imitate the working of the

brain) or thermodynamic chips which harness noise created by heat to create statistical randomness for computation.

ETC's verdict: Really about finding ways to reduce the cost for tech companies (both in hardware and energy) of the current AI boom by making the chips more efficient.

'Mathematics for Safe AI'

Big idea: As AI systems are used to manage large and complex 'cyberphysical' systems in the real world (eg energy grids, logistics, climate and weather) it will be necessary to have a way to ensure the AI is managing those systems safely rather than increasing risk.

Immediate focus: 'Safeguarded AI' programme – this attempts to construct a 'gatekeeper' mathematical system by which an AI managing a complex cyber-physical system can be accredited as 'safe'.

ETC's verdict: Really about recognising that the rhetoric of applying AI as a 'solution' to complex real-world systems could actually increase risks and trying to find a technical work around to make proposals acceptable.

'Collective Flourishing'

Big Idea: This seems to have been in flux, having developed from an Emerging Area focused on the idea that AI could be used to map every scientific argument instantly revealing breakthroughs, contradictions and gaps.

Immediate focus: Now seems to have a techno-optimist focus on addressing 'systemic complexity' with new (undefined) systems and technical capabilities focused on analysing, envisioning and "consciously creating the future".

ETC's verdict: It's notable that explicit mention of AI is no longer visible, even though the Programme Director is an AI expert. This may be a PR move or it may be related to the realisation that AI may also have to be considered part of the problem since the text mentions that "capabilities that augment our vision, action, and capacity are powerful and can have unintended consequences...we must balance the pressing need for these tools with the immense responsibility they entail."¹⁸⁴

'Extending our Perception'

Big Idea: Co-designing AI and novel sensing technologies to create 'Hypersensory Intelligence', to "perceive reality in fundamentally different ways" that go beyond human perception, supposedly to catalyse breakthroughs between disciplines.

Immediate Focus: Not yet defined.

ETC's verdict: Likely to facilitate new forms of surveillance, monitoring and control.

Climate and Biodiversity

'Engineering Ecosystem Resilience'

Big Idea: Half of global GDP depends on 'nature services' that are being threatened by ecological degradation. For technological maintenance of ecological resilience, we need precise monitoring tools and means to intervene (including genetic engineering and robotics).

Immediate Focus: A new 'Accelerated Adaptation' programme aims to intervene in the biology of wild species supposedly to prevent biodiversity loss and "secure the natural infrastructure that underpins our global economy and well-being".

ETC's verdict: Really about expanding biotech by using it in wild species for economic benefit and to address the biodiversity loss caused by our existing industrial-scale activities. Biodiversity monitoring and technological interventions are also likely to facilitate the financialization of nature and biodiversity-based capital markets.

'Scoping Our Planet'

Big Idea: Using 'frontier technologies' including AI for real-time monitoring and data gathering on earth systems, particularly climate-related.

Immediate Focus: There are two programmes. The first attempts to create a 'perpetual flight' programme that would use atmospheric energy for a sensor platform to stay aloft in the upper atmosphere, replacing satellites. The second is aimed at developing a way of modelling and predicting climate 'tipping points'.

ETC's verdict: Really about automating climate action. Real time climate monitoring strengthens a 'tipping points' narrative that

legitimizes geoengineering experimentation. New 'perpetual flight' platforms could also have dual use for surveillance or even geoengineering.

'Future Proofing our Climate and Weather'

Big Idea: If the climate system crosses key tipping points it may be necessary to deploy geoengineering technologies. This Opportunity Space intends to develop the data to see which geoengineering options are feasible.

Immediate Focus: The 'Exploring Climate Cooling' programme funds research for technical development, outdoor experiments, monitoring and public engagement on 'solar geoengineering' (reflecting sunlight).

ETC's verdict: Really about the legitimisation of solar geoengineering – eroding public concern by moving forward solar geoengineering experiments under a government agency with public money.

Crypto/Blockchain

'Trust Everything Everywhere'

Big idea: Digital protocols that enable trust (such as encryption) have been essential in the digital economy. Now that digital and physical worlds are becoming interchangeable in 'cyber-physical' systems, trust protocols need to be developed to authenticate the physical world.

Immediate Focus: The programme on 'Scaling Trust' aims to develop AI agents that "coordinate, negotiate, and verify with one another on our behalf".

ETC's verdict: Really about financializing the automation of everything - in order to merge fintech and cryptocurrencies with real world automation of systems.

Neurotech

'Scalable Neural Interfaces'

Big idea: Brain disorders cause high healthcare costs. What if we could interface directly with regions of the brain to treat or mitigate such disorder?

Immediate Focus: The 'Precision Neurotechnologies' programme seeks to develop brain machine interfaces that are more

precise but less invasive than existing interfaces; and the 'Massively Scalable Neurotechnologies' programme is intended to do what it says on the tin, massively scale up this ability to interface with the human brain.

ETC's verdict: Although sold as a health technology for addressing neural 'disorders', there is a huge potential market for non-invasive brain machine interfacing, with significant implications in terms of privacy risks, militarisation etc, plus concerns about medicalising neurodiversity.

Robotics

'Smarter Robot Bodies'

Big idea: An aging shrinking global population will require more robots to take over human tasks but progress in improving physical manipulation abilities in robots is slow and needs to be accelerated.

Immediate Focus: The 'Robot Dexterity' programme works on improving the ability of robot bodies (hardware) to grab, manipulate and control.

ETC's verdict: Really about widespread automation, enabling effective automation to replace labour across many fields of the economy where human hands are still currently needed (e.g. health, agriculture, manufacturing etc.).



ANNEX 2: MORE ABOUT DARPA



When US research laws temporarily put limits on civilian-projects being pursued by DARPA some of those working for the agency transferred to new DARPA-inspired corporate labs such as Bell's Xerox Parc, where many of the elements of the personal computer were first developed and then copied by new computer startups Microsoft and Apple.¹⁸⁵ Along with military-sponsored computing by companies such as Hewlett Packard, these inventions became the basis of the current 'Silicon Valley' tech industry.¹⁸⁶

The association with the internet and the supposed free-wheeling and 'blue skies' nature of applied tech research at DARPA and Xerox Parc subsequently became the stuff of Silicon Valley legend alongside the supposedly similar inventive culture attributed to the Advanced Development Programme of arms manufacturer Lockheed Martin – also known as the 'Skunkworks' (that gave birth to the U2 spy plane, stealth bombers and drones).¹⁸⁷ DARPA, XeroxParc and Skunkworks were reported to give 'genius' heroic inventors free latitude to follow their creative curiosity – an approach also copied by institutions such as MIT's Media Lab in the 1980s and 1990s which still solicits millions of dollars of corporate sponsorship for creative inventors to explore new technologies in return for full access to the lab's intellectual property.¹⁸⁸

In the 2010s a sense expressed by some industrialists that American innovation was 'stagnating'¹⁸⁹ saw a quickening of interest in the DARPA, Xerox Parc and Skunkworks models as potential routes for jump-starting commercial invention. In 2011 search giant Google established its own private DARPA-like lab called Google X which they dubbed 'the Moonshot Factory' – drawing on America's history of aiming for the 'big bet' moon landings as inspiration. X-labs, helmed by charismatic science entrepreneur

and 'captain of Moonshots' Astro Teller, is where Google developed its 'Waymo' self-driving taxi business, its unsuccessful 'Google Glass' (digital glasses) project and other projects to release anti-malarial bacteria in mosquitos or float balloon-based internet networks ('Loon').¹⁹⁰ The George W Bush administration also tried to replicate the DARPA model by establishing ARPA-E – a DARPA-like high risk-high reward funding agency for 'breakthrough' energy tech sponsored by the US Department of Energy. Subsequent US 'ARPA' funding agencies have included ARPA-H (for Health tech), IARPA for Intelligence tech ('DARPA for Spooks'), ARPA-I (infrastructure) and even a US AgARDA (which was approved in law but never established) to "generate and deploy advanced agricultural technologies."¹⁹¹

The DARPA-like 'moonshot' funding landscape is littered with diverse public and private attempts to amp up 'breakthrough' technical inventiveness through gimmicks, competitions, fellowships, accelerators and more, and key tech accelerators such as Silicon Valley's Y-Combinator and Peter Thiel's 'Thiel Fellows' and 'Emergent Ventures' are mainstays of the Silicon Valley tech ecosystem.¹⁹² Peter Diamandis' X-prize (and its rash of imitators) began by offering large prizes for unorthodox breakthrough tech teams building rockets, fast gene sequencers, geo-engineering proposals or new conservation tech.¹⁹³ A notable recent programme is Wellcome Trust's Wellcome LEAP programme¹⁹⁴ (led by ex-DARPA staff), and there is now a whole movement in tech philanthropy focused on trying to fund experimental big science projects in the mould of DARPA, Skunkworks etc. Indeed, this whole domain of stimulating so called 'deep tech' is an active object of study for those tracking the 'science of science research' (known broadly as 'meta-science' – see more about this in Box 3 above).

ANNEX 3:

'ARIA ADJACENT' – ARIA's IDEOLOGICAL PEERS



Peter Thiel

Co-founder of Paypal and Palantir, Peter Thiel has been referred to as the 'dark lord' of Silicon Valley¹⁹⁵ and wields immense ideological and financial influence over the libertarian end of the conservative movement worldwide. Thiel, who edited a libertarian newspaper when at Stanford University and has written a book attacking 'political correctness', "The Diversity Myth",¹⁹⁶ was the first tech billionaire to openly back Donald Trump's MAGA politics. He founded notorious military surveillance tech company Palantir, bankrolled a generation of radical conservative activists including US Vice President JD Vance¹⁹⁷ and continues to expand a well-funded network of ideologically right-wing policymakers, tech bros and companies through his Founders Fund, Thiel Fellows and related endeavours.

Both Cummings and Clifford are long-time admirers of Peter Thiel and his views, and Cummings was notably part of a secret meeting with Thiel and Boris Johnson.¹⁹⁸ Following this meeting Palantir became a central player in the UK Government's response to COVID-19. It was awarded an initial National Health Service (NHS) contract for just £1 which allowed the company to integrate into UK health data systems at virtually no cost, before the deal expanded to the Federated Data Platform, a vast NHS data infrastructure project worth between £330 million and £480 million, described as "the largest data deal in NHS history."¹⁹⁹

When Peter Thiel gave a series of lectures on "Sovereignty and the Limits of Globalization and Technology" at Stanford, Matt Clifford organized a parallel reading

club in London over several weeks where like-minded UK tech establishment people discussed Thiel's ideas and his reading list.²⁰⁰ UK Prime Minister Keir Starmer visited Palantir's headquarters in Washington in February 2025 while Clifford was his AI advisor.²⁰¹ More significant, however, has been the effect of the ideological project that Thiel has pursued. Like Cummings, Thiel fixates on industrial stagnation and the need to overcome it through high tech government intervention. Thiel also bankrolls Tyler Cowen's high risk-high reward Emergent Ventures fund which "supports entrepreneurs and brilliant minds with highly scalable 'zero to one' ideas".²⁰² Thiel's influence also stretches into the ARIA Programme Directors layer. Amongst the young 'brilliant minds' Thiel has financially sponsored is David 'Davidad' Dalrymple, an 'Effective Altruist' youth genius turned ARIA Programme Director who received a 'personal grant' from Thiel in 2012-2013.²⁰³

Tyler Cowen

One of ARIA's founding principles is the idea of using state capacity (and funds) to support private tech enterprises in a hands-off way – so called 'State Capacity Libertarianism'.²⁰⁴ It is a term and set of ideas developed by Georgetown University professor Tyler Cowen who in turn is much quoted by both Dominic Cummings and Matt Clifford in their respective blogs. The underlying concern of Cowen, an economist, is that modern western economies are experiencing 'The Great Stagnation'²⁰⁵ and that a series of forces such as the modern environmental movement and precautionary environmental laws have throttled back the natural dynamism that the American

economy should be experiencing. In 2019 Cowen co-published a high-profile article in *The Atlantic* with Patrick Collison entitled “We need a new science of Progress”²⁰⁶ which called for a new discipline of ‘Progress Studies’. It looked to hands-off experimental funding formats such as that used for DARPA. Cowen also established the Emergent Ventures fund²⁰⁷ (using money from Collison and Thiel) which has helped bankroll Progress Studies into a movement.

Patrick Collison

The Irish-born, San Francisco-based founder of Stripe, the fintech payments company, is listed as an advisor to ARIA and was described by Dominic Cummings as a “brilliant founder” and “a very unusual CEO”²⁰⁸. Less brash and more under the radar than Elon Musk or Thiel, the Silicon Valley tech billionaire nonetheless looms ever larger in the tech industry’s strategies when it comes to ‘deep tech’ research. An article he co-wrote with Tyler Cowen reflects his own ongoing obsession with the problem of ‘stagnation’ in productivity which, like Cowen, he attributes to factors such as the establishment of the Environmental Protection Agency and precautionary laws in the 1970s.²⁰⁹

Stripe has quietly played a key role in supporting radical technologies – especially geoengineering technologies – by pre-buying carbon credits for carbon dioxide removal schemes such as direct air capture and seaweed dumping.²¹⁰ Collison and his wife (a biochemist) also responded to the COVID Pandemic by establishing the fifty million-dollar ‘Fast Grants’ programme which awarded 260 grants to scientists who wanted to work on COVID-19 vaccines and treatments²¹¹ – seen as an experiment in hands-off science funding. Fast Grants was managed by Emergent Ventures, the Peter Thiel-sponsored funding stream managed by Tyler Cowen. Collison is also the co-founder and founding donor of the much-vaunted ARC Institute²¹² – a high-profile private

biotech research institute loosely associated with Stanford University in which genius scientists are given long tenure and little oversight to pursue big breakthrough tech bets in an ARPA-style environment. Among the projects causing waves at the ARC Institute is Evo2, a genomic AI large language model co-developed across “all domains of life” with AI giant NVIDIA which can create novel genomes and DNA sequences²¹³ – including AI-designed viruses that can kill bacteria.²¹⁴ ARC is seen as being at the forefront of a next wave of Synthetic Biology known as generative biology which now includes the UK-based Ellison Institute of Technology at Oxford University (bankrolled by Oracle founder and briefly the world’s richest man, Larry Ellison).²¹⁵

Eric Schmidt and Google

Analysis of ARIA as an institution reveals that one company, Google, has an outsize imprint on the agency. Google’s prize AI startup, Google DeepMind is arguably over-represented, with founder Demis Hassibis listed as an Advisor, and Max Jaderberg, the Chief AI officer of Isomorphic Labs, which is a DeepMind spin-out, now on ARIA’s Board.²¹⁶ In addition, the board features Google X’s former Director of Global Public Policy Sarah Hunter, and Google DeepMind is a formal Activation Partner. The politically powerful former Google Chairman Eric Schmidt is also an AI-obsessed tech billionaire although he does not seem to have fallen in behind the Trump/Thiel agenda so far. Schmidt’s web of philanthropic big science and tech ventures (clustered under ‘Schmidt entities’) is something of a metascience project in itself (and includes significant funding for a new philanthropic outfit called Renaissance Philanthropy (or ‘RenPhil’) headed by former Clinton aide Tom Kalil (formerly Chief Innovation Officer at Schmidt Futures). In October 2024 RenPhil also partnered with ARIA as an ‘Activation Partner’ with a view to translating ARIA’s deeptech research into investment-worthy commercial products.²¹⁷

NOTES



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