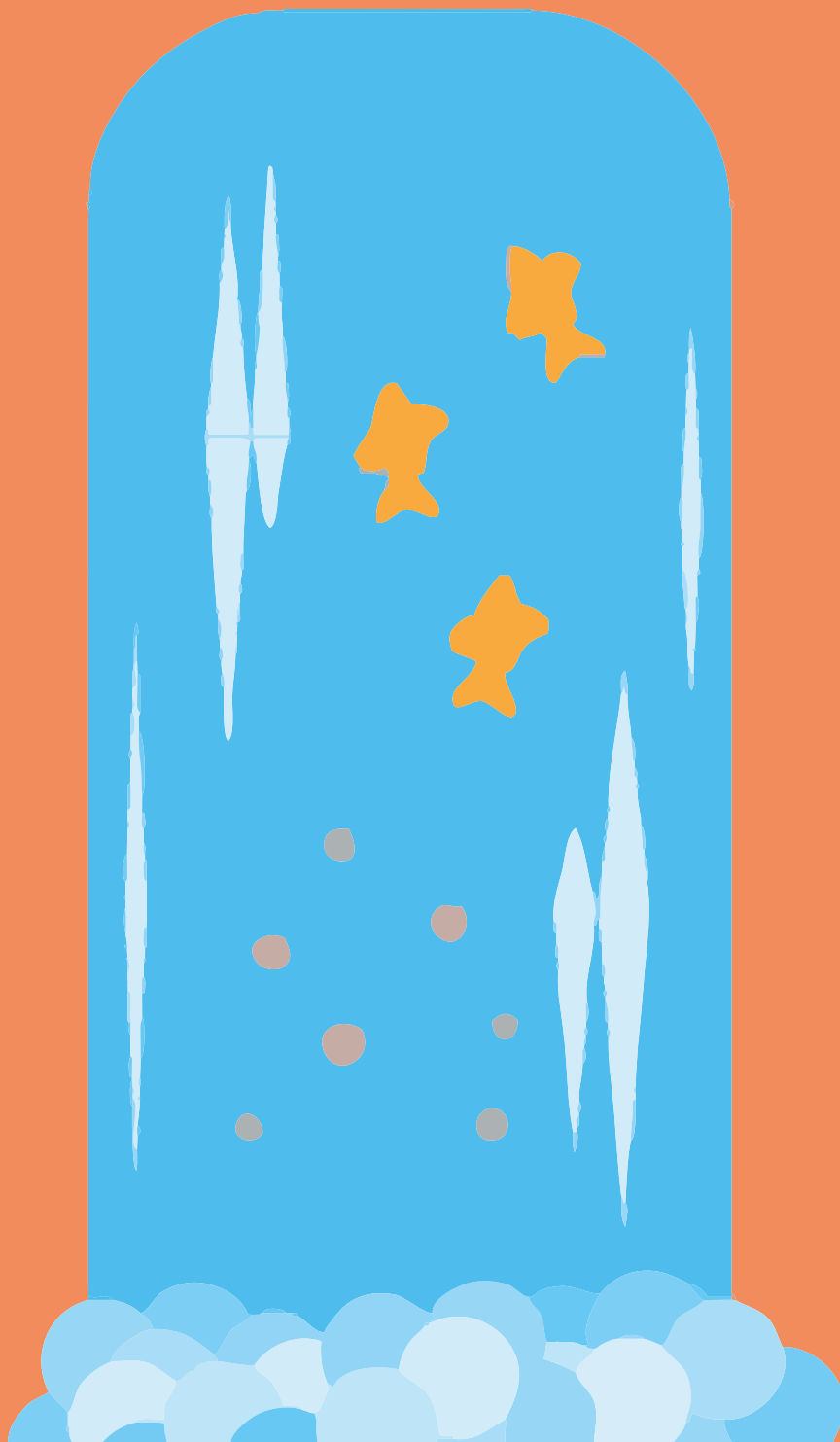


HERESY

P R O J E C T

LANCING COLLEGE 2022–23



Front Cover by Jeremiah Sung (Gibbs') and co-designed by Hadrien Ng. Jeremiah is studying Art, English and Maths at A Level and hopes to pursue Architecture at university. He writes that 'at first, I was unsure how to encapsulate the idea of heresy visually. I thought of a sharp fountain pen, but that seemed a cliché, appropriate for any essay competition. Then I thought of "swimming against the current" – believing in something despite everyone else saying and thinking otherwise – an image which seemed to fit perfectly. The three fishes in the foreground, swimming up the waterfall represent the trio of winning heretics, and the seven fishes in the background represent the shortlisted heretics'.

The Lancing Lower Sixth Heresy Project 2022–23

Preface

‘It only takes two facing mirrors to build a labyrinth’.
(Jorge Luis Borges)

‘I am, and have ever been, a great reader – and have read almost everything – a library cormorant. I am deep in all out-of-the-way books’.
(Samuel Taylor Coleridge)

The Advent Term 2022 saw the Lower Sixth produce a truly outstanding range of essays for the Heresy Project, as fresh, irreverent and spikily intelligent as ever. This is clearly not a generation idly content, in Evelyn Waugh’s words, just to ‘put the words down and push them a bit’. They met with relish the project’s challenge of disrupting easy intellectual orthodoxies in extended essays of 1,500 to 2,000 words. There was some first-class writing: subtle, acerbically pointed and deeply well-researched, pushing the case for a rich variety of heretical causes with untold intelligence and panache. Lancing’s proud tradition of forceful, articulate and acutely well-informed independence of thought burns ever more brightly. The bubble of US geopolitical pretensions was pricked, the bohemian posing of ‘Bloomsberries’ wryly unpicked, and music was prescribed for a broken heart.

The following collection contains the final shortlist of the best heretical essays. It also includes the winning heretical entries. It was hugely difficult to make a decision on the final shortlist, and this year about fifteen more essays could have made the heretical grade. After a lengthy debate, a grand jury in the Common Room of Dr Kerney, Dr Herbert, Mr Harman and Mrs Mole finally agreed on the winners from the shortlist; and it was decided that three entrants should be jointly awarded top prize. These three essays were marked out by the formidable breadth of their research, the sophisticated fluency of their arguments and the sheer relish with which they laid into their heretical targets: just the qualities of intellectual flair and rigorous independent thought sought out by the very best universities.

Lancing’s winning heretical trinity this year comprises:

Christopher Clay for his essay:

Putin’s war in Ukraine is wrong. But can the United States really talk?

Hannah Cleallsmith for her essay:

The Bloomsbury Group were bohemian poseurs, not a credible intellectual movement.

Alex Mawhinney for his essay:

There is no need for NASA in the 21st century.

Dr Damian Kerney
Head of History and Sixth Form Enrichment

The Shortlisted Heretics

Lancing's winning heretical trinity:

- | | | |
|----|-------------------------------|--|
| 6 | Christopher Clay
(Teme) | <i>Putin's war in Ukraine is wrong.
But can the United States really talk?</i> |
| 14 | Hannah Cleallsmith
(Manor) | <i>The Bloomsbury Group were bohemian poseurs,
not a credible intellectual movement.</i> |
| 18 | Alex Mawhinney
(Second's) | <i>There is no need for NASA in the 21st century.</i> |

The heretical runners-up:

- | | | |
|----|--------------------------------------|---|
| 24 | Rosa Flack
(Sankey's) | <i>The government was right to scrap the
Arts Premium initiative.</i> |
| 26 | Zain Fletcher
(Head's) | <i>Modern skyscrapers need redesigning: here's why.</i> |
| 30 | Marnix Harman
(Head's) | <i>The NHS should spend less money on drugs
and more money on music.</i> |
| 34 | Grace Murray
(Sankey's) | <i>Should you have to pass a mental competence test
to be eligible to vote?</i> |
| 38 | Kate Pinnell
(Handford) | <i>How far can it be said that the perfect fifth is
the most crucial interval in classical music?</i> |
| 40 | Harriet Shadbolt
(Sankey's) | <i>How far can it be said that genetic engineering
is more beneficial than harmful?</i> |
| 44 | Ayomide Sotande-Peters
(Handford) | <i>The modern world has forgotten over
400 years of black oppression.</i> |



1: The Winning Trinity of Heretics

'The trouble with modern education is you never know how ignorant people are'.

(Evelyn Waugh OL)



'O Captain! My Captain!'

(Walt Whitman)

14th Century Pontifical of Guillaume Durand
(Bibliothèque Sainte-Geneviève, MS. 143, f. 77v).

Putin's war in Ukraine is wrong. But can the United States really talk?

Christopher Clay



Christopher is studying History, Physics, Maths and Further Maths at A Level. Increasingly his interests have come to focus on investigating the politics, science and downright absurdity of nuclear weapons strategy and the 'ready: safe dilemma'. He intends to study History at university.

Introduction

The year is 1914. You are the Archbishop of Canterbury. You have just been asked to write a document based on a shaky, roughly 1,500-year-old theory, justifying your country's actions in the eyes of God. In the footsteps of Anselm II of Lucca, a key canon lawyer for Pope Urban II as he launched the First Crusade, you are attempting to justify a bloodthirsty rampage in the name of St Augustine of Hippo's Just War theory. Unbelievably, the British government commissioned the archbishop to write a theological justification for the First World War¹. People have always looked for ways to justify wars; and this was Just War's last hurrah before we switched to the joys of fascism, communism and capitalism as buzzwords to justify conflict. Without scriptures to guide us, however flawed, it is very hard to decide if conflicts are justified. When Russia invaded Ukraine in 2022, the US made an official *United with Ukraine* web page, claiming 'the borders and territorial integrity of a state cannot be changed by force' and 'all members of the international community ... must face consequences if they break their solemn commitments'². I absolutely agree, but I cannot ignore the irony oozing from this pronouncement. What about US military engagements in Afghanistan, Iraq, Syria, Libya, Vietnam and Cuba? And the list goes on. I feel the disparity between US rhetoric and historical reality urgently demands a comparative study of US and Russian military aggression. I think it would be unfair just to weigh up all these US wars against the present conflict in Ukraine (Russia has fought other wars as well). As such, I have decided to choose the closest example the US has to Russia's invasion of Ukraine: the Bay of Pigs incident (given Cuba's proximity to the United States and because of the primarily political motive for the US invasion). To run such a study, I have compared the leaders, the verbal and geopolitical justifications provided for both conflicts and the plans of attack.

A comparison of the leaders

Firstly, there are a great number of similarities between Castro and Zelensky, the leaders of the countries invaded. Both leaders, on taking power, were extremely popular. Castro was popular because of the corruption of the former American-backed leader, Batista, whose levels of corruption were even resented by William Morgan, the American director of the Cuban Revolutionary Forces³. Batista had come to power undemocratically by military coup, turning Cuba into a 'hedonistic playground for the world's elite, producing huge gambling, prostitution and drug profits for American mafiosos, corrupt law-enforcement officials and their politically elected cronies'. This meant Castro, beyond using force, could for some time ride an anti-capitalist wave to the top job⁴. Equally, Volodymyr Zelensky came to power on a comparable wave of anti-Russian sentiment, sweeping through Ukraine after Victor Yanukovych tried to forge closer ties with Russia instead of the EU in February 2014⁵. This led to the 'Euromaidan' protests; and the dramatic contrast in demographic groupings voting for Yanukovych as opposed to his immediate successor, Poroshenko can be seen in **Figures 1 and 2**. Yanukovych was most popular in Donetsk and Luhansk (which have the highest numbers of Russian speakers and pro-Russian members of the population), but the opposite was true for Poroshenko. Crimea was also then not included in Poroshenko's result (although some Crimeans were included in the 'Voters outside Ukraine' category). Against this background, Zelensky was elected because of corruption scandals engulfing Poroshenko, and by capitalising on his fame as an actor on a popular TV show.

¹ Stuart Mews, 'Davidson, Randall Thomas, Baron Davidson of Lambeth (1848–1930), Archbishop of Canterbury' *Oxford Dictionary of National Biography* (Oxford, 2011).

² 'United with Ukraine' *U.S. Department of State*, available at <https://www.state.gov/united-with-ukraine/>.

³ '(1959) The American Comandante in the Cuban Revolutionary Forces: William Morgan' *The Cuban History.com*, available at <https://www.thecubanhistory.com/2012/2005/william-morgan-a-rebel-americano-in-cuba/>.

⁴ 'Cuban Revolution' *Encyclopaedia Britannica*, available at <https://www.britannica.com/event/Cuban-Revolution>.

⁵ 'Ukraine: is Yanukovych finished?' *The National Interest* (28/1/2014), available at <https://nationalinterest.org/commentary/ukraine-yanukovych-finished-9775?page=>.

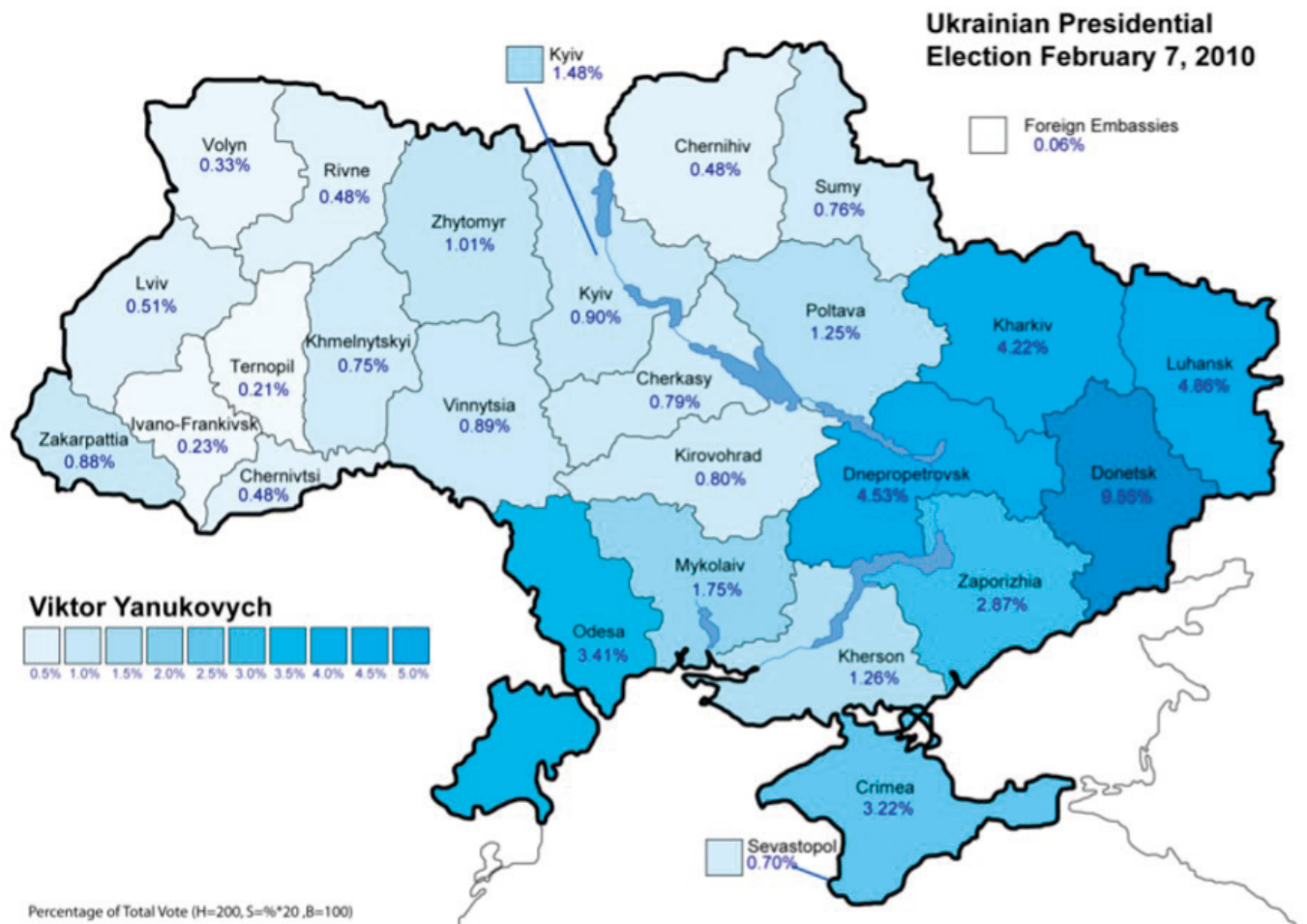


Figure 1: Percentage of the total vote gained by Viktor Yanukovych by region of Ukraine.

2014 Ukrainian Presidential election::Poroshenko

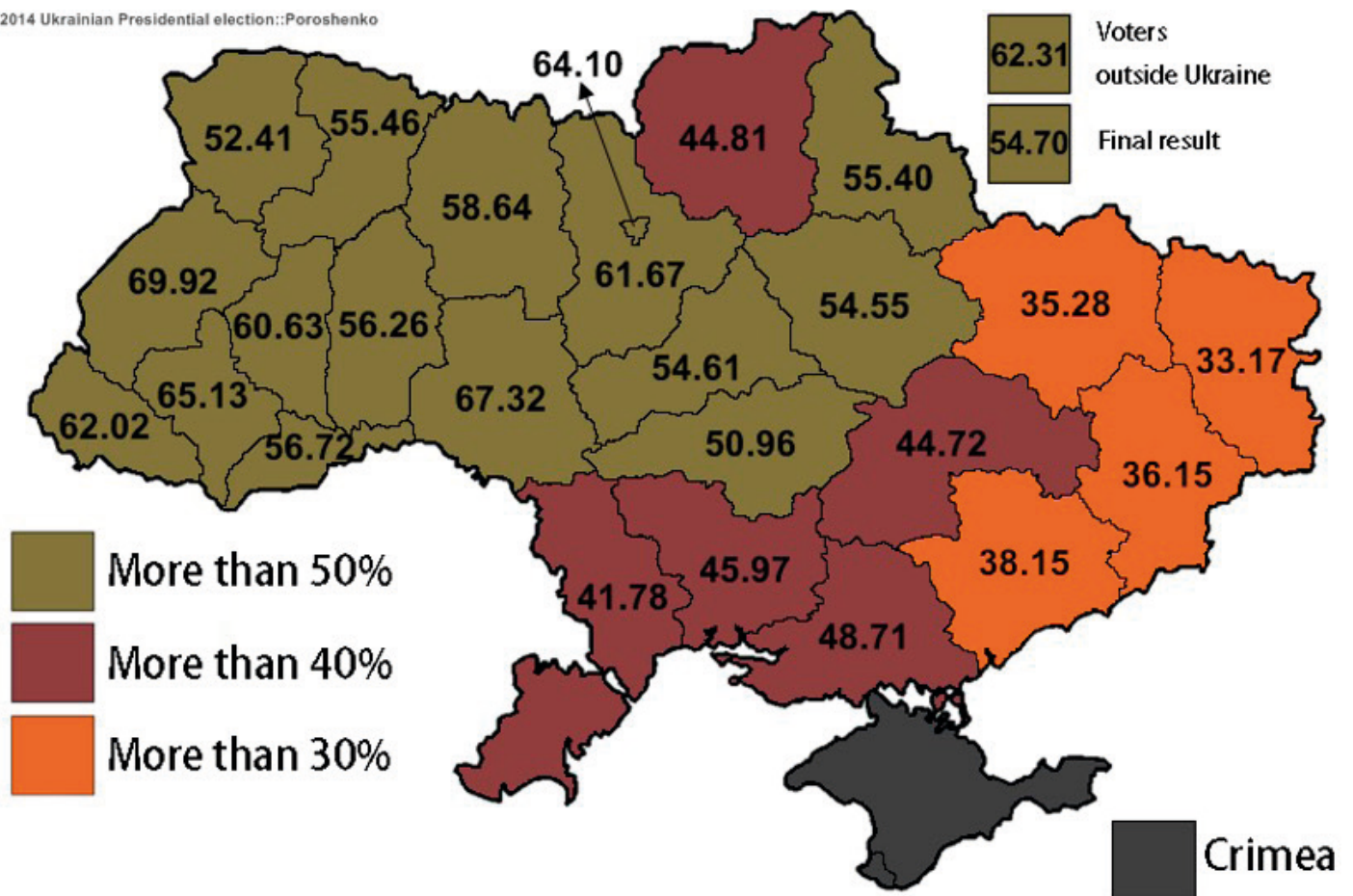


Figure 2: Percentage of the total vote in each region of Ukraine gained by Petro Poroshenko.

However, it must be noted that while both leaders were popular at first, Zelensky was very unpopular at the time of the invasion. His popularity rating was only 28.2% in October 2021, in part because of corruption scandals of his own⁶. By contrast, Castro, even in 2015 and after decades of corruption, still had a 44% popularity rating⁷. Indeed, whilst we do not have any exact figures, we can assume Castro was highly popular at the time of the Bay of Pigs, given the crowds surrounding his march through Havana in **Figure 3**.



Figure 3: Fidel Castro's entrance to Havana (January 8, 1959).

A comparison of the verbal justifications for invasion

There are also significant similarities between the justifications given for both invasions. Both utilised liberation rhetoric. Russia's Foreign Minister, Sergei Lavrov stated the campaign in Ukraine was to 'help the people of eastern Ukraine to liberate themselves from the burden of this absolutely unacceptable regime'⁸. In his essay *On the Historical Unity of Russians and Ukrainians*, Putin also stated his disgust that the 'law on the "purification of power", the law on education ... virtually cut the Russian language out of the educational process'⁹. In essence, he said the Ukrainians were crushing the Russian-speaking and separatist population living in Donetsk and Luhansk, seeking to remove their collective history. Similarly, the Cuban Freedom Brigade document suggests the goal of the Bay of Pigs operation was in part 'to assist the people of Cuba in reasserting their political independence'¹⁰. Both justifications are, to some extent, lies. One of Putin's main talking points, the Law on the Purification Power,

⁶ 'Survey: Most Ukrainians disapprove of Zelensky's actions' *Kyiv Post* (2/11/2021), available at <https://www.kyivpost.com/ukraine-politics/survey-most-ukrainians-disapprove-of-zelenskys-actions.html>.

⁷ 'Cuba: Do you have a positive or negative opinion of Castro?' *Statista* (April 2015), available at <https://www.statista.com/statistics/419412/popularity-of-fidel-castro-in-cuba/>.

⁸ Susie Blann, 'Russia seeks regime change in Ukraine, says Moscow's top diplomat' *The Sunday Morning Herald* (26/7/2022), available at <https://www.smh.com.au/world/europe/russia-seeks-regime-change-in-ukraine-says-kremlin-s-top-diplomat-20220726-p5b4i5.html>.

⁹ Vladimir Putin, 'On the historical unity of Russians and Ukrainians' *President of Russia* (12/7/2021), available at <http://en.kremlin.ru/events/president/news/66181>.

¹⁰ 'Cuban Freedom Brigade' *John F. Kennedy Presidential Library and Museum*, available at <https://www.jfklibrary.org/learn/about-jfk/jfk-in-history/the-bay-of-pigs>.

upon (not so) close analysis, does not ban the learning of Russian in schools¹¹. Instead, it says Ukrainian must be taught in school, without even mentioning Russian. Ukrainian and Russian are also very similar languages, so much so that a speaker of one can largely understand what someone in the other is saying. In fact, as **Figure 4** shows the pro-Russian party, Opposition Platform – For Life gained 13% of the vote in the 2019 general election (making it the second largest parliamentary party). It gained over 50% in the separatist regions and less than 5% in western Ukraine overall, but it has now been banned from speaking in parliament following the 2022 invasion. The American argument concerning Cuba is also clearly a lie. The US government did nothing during Batista’s reign to assist Cuban independence, even though he was just as anti-democratic as Castro. More than that, according to Kennedy, US companies exploited Batista’s rule, coming to own much of Cuba’s industry: 40% of the sugar plantations, 90% of the mines and 90% of the cattle ranches and oil industry¹².

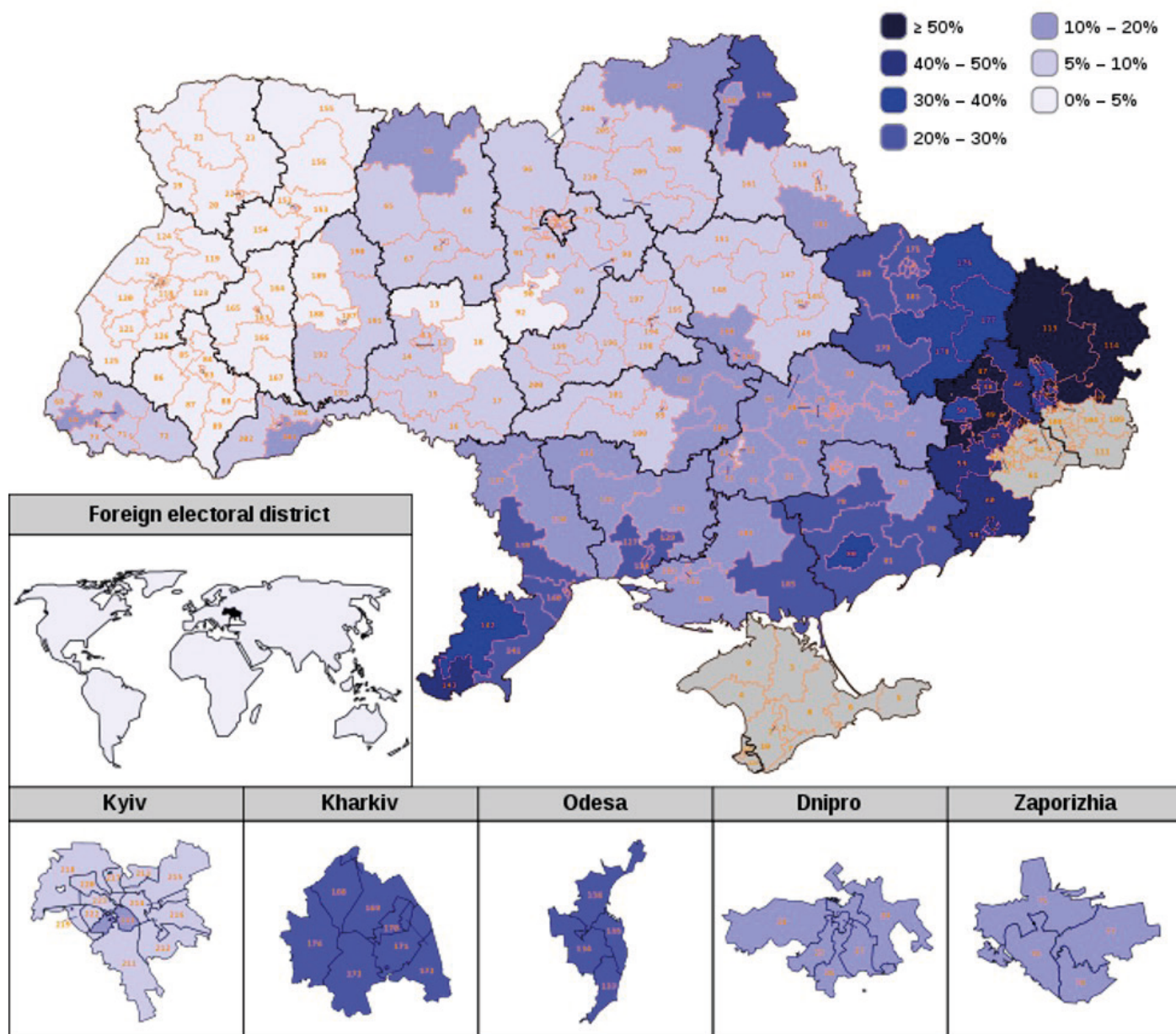


Figure 4: Percentage of the total vote by region for the Opposition Platform – For Life party in the Ukraine 2019 parliamentary election.

¹¹ 'The Law on Education' *European Commission for Democracy through Law* (15/11/2017), available at [https://www.venice.coe.int/webforms/documents/default.aspx?pdffile=CDL-REF\(2017\)047-e](https://www.venice.coe.int/webforms/documents/default.aspx?pdffile=CDL-REF(2017)047-e).

¹² 'Speech of Senator John F. Kennedy' *The American Presidency Project* (6/10/1960), available at <http://www.presidency.ucsb.edu/ws/index.php?pid=25660>.

A comparison of the geopolitical justifications

There are many reasons why the geopolitical justifications for both invasions are clear. Both the USA and Russia are extremely close to the countries they invaded, and both feared the possibility that hostile nuclear missile bases might be established in their near abroad. In the US the National Security Advisor Walt Rostow listed this as one of 'the 5 threats' of the Castro regime¹³. We know that securing such an advantage in Cuba was critical to the Soviet Union. The Soviets only had a dozen ICBMs (Intercontinental Ballistic Missiles) in 1959¹⁴. By contrast, the USA had over 1,000¹⁵. This is of critical importance: ICBMs have a range of over 5,500 km, and the distance between Washington DC and Moscow is 7,800 km. Therefore, the Soviets needed to get their far greater number of close-range missiles nearer to the USA. Cuba provided them with the perfect solution, given Cuba was just 780 km from Florida, and the US recognised this threat. Russia has also historically been worried about a nuclear threat from Ukraine. In 1994, Russia brought together the US, the UK and Ukraine to oversee the destruction of Ukraine's nuclear arsenal in exchange for security guarantees in the Budapest Memorandum¹⁶. Unfortunately, Russia broke its terms with the 2014 Russian annexation of Crimea, and to some extent so too did the other two parties by abandoning Ukraine. Ukraine is also even closer to Russia than Cuba to the US, sharing a border of over 2,000 km, only 450 km from Moscow.

However, it must be noted that I have found no evidence that the USA had any intentions of annexing or absorbing Cuba into the United States. Meanwhile, reading between the lines of Putin's essay, *On the Historical Unity of Russians and Ukrainians* we can see Putin does want Ukraine to rejoin the Russian Empire: 'Ukraine's ruling circles ... began to mythologise and rewrite history ... and refer to the period when Ukraine was part of the Russian Empire and the Soviet Union as an occupation'¹⁷.

Comparison of the plans of attack

It is also worth noting similarities between the ways in which the invasions were technically organised, even though it is not the express purpose of this largely ideological comparative study. Firstly, both sides used mercenaries. In the Bay of Pigs the entire US force was made up of Cuban guerillas, known as the Cuban Freedom Brigade¹⁸. This allowed the US to create a pretence of distance from armed intervention, in case of humiliating failure. Similarly, Russia has used the Wagner Group in Ukraine¹⁹. This has been a way to bolster Russia's armed forces and to allow the Russian Federation to commit war crimes without reflecting upon them, as in Mali and Syria²⁰. Moreover, the armed forces of Cuba and Ukraine have arguably acted, if not as mercenaries, but as proxies for the opposing major power. They have both received large supplies of weapons. Cuba was supplied with Soviet T-34s and howitzers (**Figure 5**), and the West has donated frankly exorbitant amounts of weapons to Ukraine, with the United States alone donating \$18.5 billion in military hardware²¹.

¹³ 'Cuba: Security 1961' *John F. Kennedy Presidential Library and Museum* (1961), available at <https://www.jfklibrary.org/asset-viewer/archives/JFKPOF/115/JFKPOF-115-003>.

¹⁴ Monte Reel, *A Brotherhood of Spies: the U2 and the CIA's Secret War* (New York, 2019).

¹⁵ 'How many and where were the Nukes?' *The National Security Archive* (18/8/2006), available at [https://nsarchive2.gwu.edu/NSAEBB/NSAEBB197/index.htm#:~:text=During%20the%201960s%20and%201970s,launched%20ballistic%20missiles%20\(SLBMs\)](https://nsarchive2.gwu.edu/NSAEBB/NSAEBB197/index.htm#:~:text=During%20the%201960s%20and%201970s,launched%20ballistic%20missiles%20(SLBMs).).

¹⁶ *Memorandum on security assurances in connection with Ukraine's accession to the Treaty on the Non-Proliferation of Nuclear Weapons: Budapest* (5/12/1994), available at <https://treaties.un.org/doc/Publication/UNTS/Volume%203007/Part/volume-3007-I-52241.pdf>.

¹⁷ Vladimir Putin, 'On the historical unity of Russians and Ukrainians' *President of Russia* (12/7/2021), available at <http://en.kremlin.ru/events/president/news/66181>.

¹⁸ 'Cuban Freedom Brigade' *John F. Kennedy Presidential Library and Museum*, available at <https://www.jfklibrary.org/learn/about-jfk/jfk-in-history/the-bay-of-pigs>.

¹⁹ Pjotr Sauer, 'Russia's private military contractor Wagner comes out of the shadows in Ukraine War' *The Guardian* (7/8/2022), available at <https://www.theguardian.com/world/2022/aug/07/russias-private-military-contractor-wagner-comes-out-of-the-shadows-in-ukraine-war>.

²⁰ *Centre for Strategic and International Studies*, available at <https://www.csis.org/analysis/massacres-executions-and-falsified-graves-wagner-groups-mounting-humanitarian-cost-mali>; & 'Holding Wagner to account for Russian abuses in Syria' *The Tahrir Institute* (28/3/2022), available at <https://timep.org/commentary/analysis/holding-wagner-to-account-for-russian-abuses-in-syria/>.

²¹ 'Arms transfers to Ukraine' *Forum on the Arms Trade* (2022-2023), available at <https://www.forumarmstrade.org/ukrainearms.html>.



Figure 5: A counterattack by the Cuban Armed Forces, clearly showing a T-34 tank.

Moreover, both sides tried to launch blitzkrieg style attacks. Russia's original plan (although unconfirmed by the Russian Federation) was clearly to decapitate Ukraine by airdropping elite paratroopers into Hostomel Airport and using it as a base to seize the capital²². The Russians either expected to take Kyiv in a few days or link up with troops advancing from the Belarus border. Air defence would have had to be taken out before troops could be flown into the airport (and this would have had to be achieved quickly, because paratroopers would have had to hold the airport on their own). Secondly, to supply the required equipment by air over a long period of time would have been extremely difficult. Even the Berlin Airlift as an operation on this scale, costing \$224 million, did not take place in the middle of a warzone²³.

Similarly, the Bay of Pigs invasion started with a set of B-26 bombers using the false flag markings of the FAR (Cuban Revolutionary Force), intent on taking out the Cuban Air Force²⁴. This was followed by a beach landing at *Bahia de Cochinos* (hence the Bay of Pigs). This deployed a very similar tactic to the 2003 Iraq invasion (**Figure 6**), with airstrikes followed by a rapid force intent on seizing the country from the coast. Iraq was taken in just over a month, and Iraq is roughly five times the size of Cuba. In fact, the US considered using a sonic boom to blow out all the windows in Havana, creating a similar level of disorientation to that achieved by the initial bombardment of Baghdad in the Iraq invasion.

²³ Andrew McGregor, 'Russian airborne disaster at Hostomel Airport' *Aberfoyle International Security* (8/3/2022), available at <https://www.aberfoylesecurity.com/?p=4812>.

²⁴ 'Berlin Blockade' *Encyclopaedia Britannica* (17/6/2023), available at <https://www.britannica.com/event/Berlin-blockade>.

²⁵ 'Top secret CIA "Official History" of the Bay of Pigs: revelations' *The National Security Archive* (15/8/2011), available at <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB355/>.

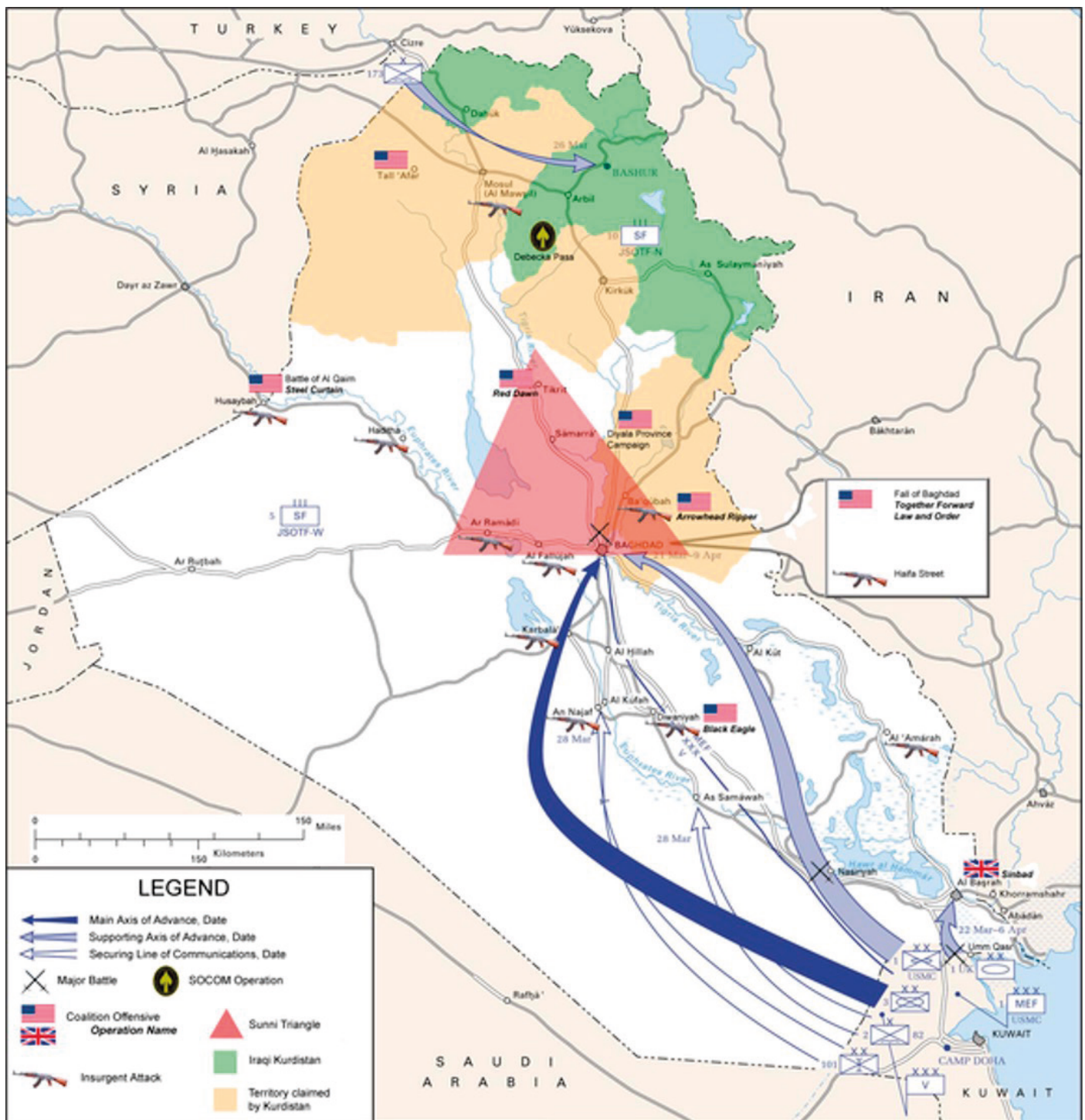


Figure 6: Route of the Allied forces during the invasion of Iraq. Note how, other than special forces, all arrived by ship.

Conclusion

When Gino D'Acampo was making macaroni cheese on *Good Morning Britain*, he was told by Holly Willoughby 'if this had ham it would taste like a British carbonara'. D'Acampo swiftly retorted, 'if my grandmother had wheels she would have been a bike'²⁵. In doing so, D'Acampo, the philosophical genius, inadvertently gave a useful lesson applicable to this debate. To the Italian food purist, these two dishes are clearly unrelated. The 'British carbonara' is 'a different recipe, it has nothing to do with macaroni cheese'. Similarly, scholars at the Institute for Strategic Studies or any other major think tank might scoff at the comparisons here drawn, pointing to the fact that they involved 'different regimes, a different geopolitical climate, distinct demographics etc ...'. And, I would say they are not wrong. However, for the British food pleb, such comparisons are useful. For many

²⁵ Gino D'Acampo, 'If my grandmother had wheels she would have been a bike' *Youtube* (18/5/2010), available at <https://www.youtube.com/watch?v=A-RfHC91Ewc>.

people, saying something tastes like a 'British carbonara' would help give a better understanding of the nature of the dish (especially if they make 'British carbonara' using cream)²⁶. Similarly, those who lived through the Bay of Pigs, and the Cuban Missile Crisis, will have a better understanding of the Ukraine conflict, and they can potentially advise policymakers what to do next. 'Those who fail to learn from history are doomed to repeat it' and whatnot ...

What I find frustrating is that the US fails to learn from its past. By committing such acts, although potentially strengthening its short-term position, it has essentially permitted other regimes to perpetrate similar crimes. This was especially true in the early 2000s, when the US fundamentally had no major enemies and enjoyed 'global hegemony'. Yet it still decided to launch its invasion of Iraq in 2003, committing several human rights abuses along the way²⁷. Russian state media has repeatedly hidden from criticism by saying 'the West did the same in Iraq', and it is not wrong.

But I agree with Gino on this one, a macaroni cheese is nothing like a 'British carbonara'.

²⁶ Bryan Webb, 'Spaghetti alla carbonara' *Great British Chefs* (2015), available at <https://www.greatbritishchefs.com/recipes/spaghetti-carbonara-recipe>.

²⁷ 'Iraq prison abuse "widespread"' *BBC News Channel* (29/5/2004), available at http://news.bbc.co.uk/1/hi/world/middle_east/3759923.stm.

The Bloomsbury Group were bohemian poseurs, not a credible intellectual movement.

Hannah Cleallsmith



Hannah is studying English Literature, French, and Politics at A Level. In this essay she indulged her literary and aesthetic interests in modernism, gender and sexuality. Recently, she has expanded these interests further, exploring Cézanne and contrasting the 'Bloomsberries' with writers including D. H. Lawrence. She hopes to read English and French at university and pursue a career in academia.

In the famous words of Dorothy Parker, the Bloomsbury Group – a circle of writers, artists and intellectuals – ‘lived in squares, painted in circles and loved in triangles’²⁸. They inhabited the Bloomsbury district of central London, one ‘of garden squares surrounded by elegant town houses’, the geometry of which certainly did not confine the group’s activities²⁹. Nowadays, the very name Bloomsbury carries with it an immediate, unquestionable notion of revolution, with a ‘culture of sexual equality and freedom’ central to Bloomsbury’s legacy dismantling the norms of its members’ Victorian upbringings³⁰. The idea that the Bloomsbury artists ‘loved in triangles’ raises a giggle in many a History lesson, but is their legacy any deeper than their controversial private lives? This essay will deconstruct the most popular ideas of Bloomsbury to find the group’s true meaning.

Bloomsbury’s most notable members were the economist John Maynard Keynes, the writer E. M. Forster and, above all, the writer Virginia Woolf. One might assume that one of these figures formed the circle. In fact, because nearly all the male members of the group had been at Trinity or King’s College, Cambridge, it was Leslie Stephen’s son Thoby who introduced these leading lights to the group³¹. His sisters Virginia (later Woolf) and Vanessa (later Bell), and brother Adrian moved to Bloomsbury after their father died. Thoby then played a key role in drawing together the founding members of what is now known as ‘Old Bloomsbury’ (Clive Bell, E. M. Forster, Duncan Grant, Desmond MacCarthy, Lytton Strachey and Leonard Woolf). He ran *Thursday Evenings* until he passed away in 1906 and Virginia ran the *Friday Club* from 1905³². After 1910, another pivotal member was Roger Fry, the art critic, painter and alumnus of King’s College. Clive Bell met him in a railway carriage between Cambridge and London and deemed this meeting ‘one of the most interesting conversations of his life’, spent ‘discussing the theory of art for hours’³³. Blurring the boundary between London and Cambridge was central to the formation of Bloomsbury.

Although membership of the Bloomsbury Group might point to a similarity of intellectual grounding, there was an educational injustice: Virginia Woolf and her sister, as women, could not attend Cambridge. In *A Room of One’s Own*, Woolf’s essay based upon two papers read to the Arts Society at Girton and Newnham Colleges in October 1928, she describes being excluded, days beforehand, from an Oxbridge library³⁴. A ‘deprecating, silvery, kindly gentleman’ appeared at the door, informing her ‘that ladies are only admitted to the library if accompanied by a fellow of the college or furnished with a letter of introduction’. Woolf concluded that she should not ‘ask for that hospitality again’ and, as ‘an hour remained before luncheon’, ‘what was one to do?’³⁵. While her male friends spoke lengthily about doing whatever they pleased, Woolf was still not allowed to be as free. This affirms the exclusion faced by Woolf from her male peers’ educational domain. Political advancements alone would not improve women’s opportunities. It was in that year that the voting franchise had been extended to women aged

²⁸ Allison Adler Kroll, ‘What was the Bloomsbury Group?’ *National Trust* (n.d.), available at <https://www.nationaltrust.org.uk/features/what-was-the-bloomsbury-group> (accessed 24/10/2022).

²⁹ ‘Lifestyle and Legacy of the Bloomsbury Group’ *Tate* (n.d.), available at <https://www.tate.org.uk/art/art-terms/b/bloomsbury/lifestyle-lives-and-legacy-bloomsbury-group> (accessed 24/10/2022).

³⁰ Allison Adler Kroll, ‘What was the Bloomsbury Group?’ *National Trust*.

³¹ ‘Bloomsbury group’ *Encyclopaedia Britannica* (2021), available at <https://www.britannica.com/topic/Bloomsbury-group> (accessed 29/10/2022).

³² Balasz Takac, ‘The Philosophy and Aesthetics of the Bloomsbury Group’ *Widewalls* (2019), available at <https://www.widewalls.ch/magazine/bloomsbury-group> (accessed 24/10/2022).

³³ John Simkin, ‘The Bloomsbury Group’ *Spartacus Educational* (1997 & 2020), available at <https://spartacus-educational.com/ARTbloomsburyG.htm> (accessed 24/10/2022).

³⁴ Virginia Woolf, *A Room of One’s Own* (London, 1928), p. 1.

³⁵ Virginia Woolf, *A Room of One’s Own*, p. 7.

over 21. Girton and Newnham had been established for women in 1869 and 1871 respectively, and Woolf spoke there in 1928, but it would be twenty more years until a woman was officially allowed to obtain a degree. Thus, while members of the Bloomsbury Group had the privilege of its name, social position and the wealth it generated, their intellectual training was from the start unequal.

To be considered an 'intellectual' or broadly social movement, a group should have political integrity. While limited in size, the revolutionary impression Bloomsbury made on society arguably suggests it had a similar impact to bigger movements. The *Encyclopaedia Britannica* describes a social movement as a 'campaign' whose 'social goal' is 'essentially collective'. Most importantly, such movements 'result from the more or less spontaneous coming together of people whose relationships are not defined by rules and procedure but who merely share a common outlook on society'³⁶. Bloomsbury's relationships 'in triangles' were certainly not 'defined by rules', perhaps suggesting the group was a 'movement' in its defiance of monogamy and heterosexuality. But as members ought to 'share a common outlook on society' and have a 'social goal', Bloomsbury begins to look less of a cohesive movement. One's outlook on society is heavily formed by one's education, meaning the male members' Cambridge experiences were set as a dominant influence on the group, putting the women into second place (reflecting where society put them). Also, to have a social 'goal', the group should have been politically united or wholly apathetic. Neither was the case. Keynes had an allegiance to the League of Nations, and Noel Annan argues Keynes 'outgrew Bloomsbury' and 'there was between him and Bloomsbury a deep rift about the nature of political obligation'³⁷. Forster was more of a 'man of the Empire', as shown by *A Passage to India*³⁸. Woolf concerned herself with women's suffrage and creative equality between the sexes (*A Room of One's Own* explains that 'some collaboration has to take place in the mind between the woman and the man before the art of creation can be accomplished'), and Grant's interests lay largely within the artistic realm³⁹. This resulted in hostility towards each other: Woolf was suspicious of Forster's misogynistic tendencies, while Forster frowned upon sapphism. It also led to a hostility to wider political movements. Woolf sneered at the Suffragettes' collective efforts, and her Cambridge-influenced (if not educated) position saw others brand her a 'snob'. In being politically free, members of the Bloomsbury Group lost ideological coherence along the way.

Bloomsbury's London focus also distanced the group from a broader cultural landscape no less vivid. In fact, the 1920s were fundamental to the establishment of much of the literary canon on which we rely today (sometimes referred to as 'the classics'). James Joyce first published his novel *Ulysses* in Paris in 1922. 'Not much happens ... yet all of life is contained' in its 700-page narrative of a single day in Dublin⁴⁰. Joyce was not a member of the Bloomsbury Group, one might suggest, cynically, because he had been born in Ireland, and he did not attend Cambridge or have a brother who had done so. Nonetheless, *Ulysses* has a 'safe seat' in the literary canon. Woolf's novel *Mrs Dalloway*, which was published by the Hogarth Press in 1925, also takes place over a day. It is a far shorter novel, at around 120 pages, and the events take place in London. In her diary, on 16th August 1922 (while she was writing *Mrs Dalloway*), Woolf noted that she was 'puzzled, bored, irritated & disillusioned' reading *Ulysses*. On 6th September, she declared that 'genius it had I think; but of the inferior water': *Ulysses* was 'a misfire', 'diffuse', 'brackish' and 'pretentious'⁴¹. Despite this, the Woolfs hoped to publish *Ulysses* on their Hogarth Press⁴². This dislike of Joyce's writing might suggest, to some extent, that Woolf feared for the critical reception of her own novel (which she was thinking of calling *The Hours*), or perhaps indicates a wider hostility between the Bloomsbury Group and artists from outside its sphere. The vorticist painter Wyndham Lewis saw Roger Fry as his nemesis, not his ally⁴³. Joyce's estrangement from London's intellectual scenes certainly influenced the course of his life: his British Library profile details that 'Joyce was convinced of the impossibility of remaining in Ireland' (especially after his mother's death) and 'he cultivated a sense of himself as an exile, living in Trieste, Zurich, Rome and Paris'⁴⁴. Therefore, the centring of Bloomsbury and other groups on London encouraged exclusion.

³⁶ Lewis M. Killian, 'Social Movement' *Encyclopaedia Britannica* (2022), available at <https://www.britannica.com/topic/social-movement> (accessed 25/10/2022).

³⁷ Noel Annan, 'Keynes and the Bloomsbury Group: A Lecture Presented on the 50th Anniversary of Keynes's Death' *Biography*, 22 (1999), pp. 16-17, available at <http://www.jstor.org/stable/23540050> (accessed 25/10/2022).

³⁸ Josh Rahn, 'The Bloomsbury Group' *The Literature Network* (2011), available at <https://www.online-literature.com/periods/bloomsbury.php> (accessed 25/10/2022).

³⁹ Virginia Woolf, *A Room of One's Own*, p. 126.

⁴⁰ 'A guide and resource to help you read James Joyce's *Ulysses*' *Ulysses Guide* (n.d.), available at <https://www.ulyssesguide.com/#> (accessed 26/10/2022).

⁴¹ William D. Jenkins, 'Virginia Woolf and the Belittling of "Ulysses"' *James Joyce Quarterly*, 25 (1988), p. 514, available at <http://www.jstor.org/stable/25484907> (accessed 26/10/2022).

⁴² Susanna Rustin, 'Boom time for the Bloomsbury Group' *The Guardian* (5/6/2015), available at <https://www.theguardian.com/books/2015/jun/05/bloomsbury-booming-legacy-celebrate-virginia-woolf> (accessed 26/10/2022).

⁴³ Susanna Rustin, 'Boom time for the Bloomsbury Group' *The Guardian*.

⁴⁴ 'James Joyce' *British Library* (n.d.), available at <https://www.bl.uk/people/james-joyce> (accessed 26/10/2022).

Bloomsbury is routinely seen as one of the first forces to break conventional boundaries of class, sexuality, censorship and politics, for some equating it to a 'movement'. The members' sexual and romantic relationships have had a profound impact on society's impression of bisexuality, currently defined as 'attraction to more than one gender'⁴⁵. Grant and Maynard Keynes were friends and sometime lovers; a select few of Duncan Grant's male lovers made visits to Charleston in Sussex, where Grant lived in a domestic partnership with Vanessa Bell and her children⁴⁶. But Bell and Grant also had a lovechild, Angelica (born at Charleston on Christmas Day, 1918), who believed, until her 17th birthday, that Clive Bell was her father. By concealing this fact, however liberal the group might have been, and with Grant's homoerotic drawings kept secret until recently, it can be said that the 'revolutionary' factor of the Bloomsbury Group was always limited by concern for wider social attitudes. This then limited Bloomsbury's value as a revolutionary intellectual force: its actions remained confined. E. M. Forster wrote *Maurice* in 1913; he revised the story several times during his life, but it was never published until after his death, as the book's homosexual themes were unacceptable. These same attitudes kept Forster from being honest about his sexuality, other than to his friends⁴⁷. Members of the Bloomsbury Group were also not the first or only ones to write about sexuality. *The Well of Loneliness* is a lesbian novel, written by Radclyffe Hall and first published in 1928. On 16th November 1928, its destruction was ordered, for the crime of 'pleading for social tolerance for lesbianism', known as 'sexual inversion'⁴⁸. Of interest to Adam Parkes is that Woolf's *Orlando: A Biography*, published in the same year and inspired by her lover Vita Sackville-West, using the narrative of a duke who becomes a woman, 'clearly broached the same subject', but 'escaped official censure'. With Hall giving a more objective view of lesbianism, Parkes says *Orlando* 'mocks all normative sex and gender codes' and plays with the imagination through 'fantasy'⁴⁹. This comparison shows there were portrayals of homosexuality beyond the Bloomsbury Group that were far more down to earth and distanced from the bohemian imagination; and it suggests Woolf remained, unfairly, 'above' society's censorship. Further examples of non-heterosexual figures pre-dating the Bloomsbury Group include Colette, who was born in 1873 and is thought to have had 'lesbian tendencies', and the Greek lyrical poet Sappho, whose suspected lesbianism inspires the modern term 'sapphic'. Bloomsbury artists, hence, were not so much *pioneers* as *poseurs*, and only then when society allowed.

The *Cambridge Dictionary* says that a *bohemian* likes 'artistic and unusual things', living 'in an informal way' which 'ignores' what is 'accepted'⁵⁰. So far, it is this essay's verdict that, having compromised the group's classification as an 'intellectual movement', Bloomsbury artists were *bohemian poseurs*. However, Alison Light writes in *Mrs Woolf and the Servants* that 'Virginia's dependence on her servants' obstructs any view of her and Bell as 'bohemian, free women, creating a new kind of life'⁵¹. Class is vital to any perception of the Bloomsbury Group, with some members not necessarily wealthy. Woolf, alongside other Bloomsbury artists, was viewed as increasingly unrelatable as her fortune and recognition multiplied. Between Woolf and those she employed, there was a vast difference in wealth, raising the question as to whether bohemian 'informality' could really defy divides of class. Nonetheless, it must be argued that the descriptor 'bohemian' was self-chosen – the 'Bloomsberries' knew what they were doing. Bell and Woolf could call themselves bohemian if they felt so, even if this meant that parts of their existence, such as the treatment of their staff, had to fall beneath the surface. As *poseurs*, with an inherent wish to impress others, they knew this would not matter so much in the long run.

In conclusion, the Bloomsbury Group's colourful, modernist lifestyle is valuable to social history, but to call it an 'intellectual movement' is unjust. Freedom can often be the solvent of coherent group unities; and, through its artists' choice of liberty, Bloomsbury will always have a more individual than collective impact. Its 'revolution' was limited by an alertness to broader societal attitudes, but it was through its members' embrace of their own bohemian tendencies that Bloomsbury's contribution to the literature, art and thought of our times is so multi-faceted. The members of Bloomsbury were intellectuals through their work, but true bohemian poseurs by nature – and of that, and what it brought, they were proud.

⁴⁵ Sally Corbett, 'Bi, Pan, and the Insufficiency of Prefixes' *Bisexual Organizing Project* (2018), available at <http://www.bisexualorganizingproject.org/whats-up/bi-pan-and-the-insufficiency-of-prefixes> (accessed 28/10/2022).

⁴⁶ Eleanor Jones, 'Painting in circles and loving in triangles: the Bloomsbury Group's queer ways of seeing' *The Conversation* (2017), available at <https://theconversation.com/painting-in-circles-and-loving-in-triangles-the-bloomsbury-groups-queer-ways-of-seeing-75438>, (accessed 25/10/2022).

⁴⁷ 'E. M. Forster 1879-1970' *Queer Portraits in History* (n.d.), available at <https://www.queerportraits.com/bio/forster> (accessed 28/10/2022).

⁴⁸ Adam Parkes, 'Lesbianism, History, and Censorship: The Well of Loneliness and the Suppressed Randiness of Virginia Woolf's Orlando' *Twentieth Century Literature*, 40 (1994), p. 434, available at <https://www.jstor.org/stable/441599> (accessed 28/10/2022).

⁴⁹ Adam Parkes, 'Lesbianism, History, and Censorship: The Well of Loneliness and the Suppressed Randiness of Virginia Woolf's Orlando' *Twentieth Century Literature*, p. 436.

⁵⁰ 'Bohemian' *Cambridge Dictionary* (n.d.), available at <https://dictionary.cambridge.org/dictionary/english/bohemian> (accessed 29/10/2022).

⁵¹ Alison Light, *Mrs Woolf and the Servants* (London, 2008), p. xvii.

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There is no need for NASA in the 21st century.

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Introduction

Over the more than six decades of its existence, NASA has become synonymous with cutting edge American technological achievement. After all, the agency has arguably been responsible for the greatest human feat to date: Neil Armstrong's landing on the Moon in 1969. However, despite its past, NASA in its current state has no role in the 21st century space industry. Following the Apollo programme's termination in 1972, NASA became stagnant, and even though it regained some popularity through projects including the Space Shuttle and International Space Station, it has never again captivated the American public in quite the same fashion. This stands in stark contrast to work being done in the private sector, where entrepreneurship, innovation and inspiration are rife, as Musk, Bezos, and others look to propel humanity to the stars at a pace never seen before.

Criticism of NASA

Human spaceflight accounts for more of NASA's budget than anything else. It takes up 44.9%; and, as the current Artemis project's ambition to return to the Moon is delayed, ongoing holdups have both highlighted and exacerbated NASA's myriad failings, rooted in excessive US bureaucracy⁵². At George W. Bush's request, the Constellation programme was born in 2004, to return humanity to the Moon⁵³. However, the project fell behind schedule; and, in 2009, the Augustine Committee – a space policy group assembled to scrutinise the 'state of America's manned space programme' – found it was on an 'unsustainable trajectory', with a mismatch between goals and resources⁵⁴. Naturally, President Obama cancelled funds for manned lunar missions in February 2010, ending Constellation⁵⁵. However, after intense political pressure, especially following significant job losses, Obama was forced to back pedal, signing the NASA Authorization Act 2010 in October. This required 'existing workforce and capabilities from the Space Shuttle, Orion and Ares 1 projects' to work on the new Space Launch System. Consequently, the spacecraft used today in the Artemis project comes from a messy conglomeration of both parts and people from old NASA ventures⁵⁶. In short, one over-budget project was cancelled, before being brought back in the same year, but then only with more design restrictions: an immensely inefficient way to build a rocket. Moreover, the very principle the Space Launch System is built on is outdated, given the dawn of reusable rockets, following developments pioneered by SpaceX. The use of single-use, disposable rockets seems almost backward. It is as if NASA is making a desperate attempt to revive its golden era of the 1960s.

Even so, many praise NASA for its economic output. Its economic impact is over \$64 billion annually, while in 2005 the agency brought in an estimated \$180 billion to the American economy⁵⁷. These sums simply cannot be shrugged off and the private sector certainly has catching up to do. However, companies are now offering innovative products and services, such as SpaceX's Starlink, the value of which will in future probably far exceed that of NASA, given recent private sector growth. For instance, Starlink alone is projected to bring in \$10 billion

⁵² 'Your Guide to NASA's Budget' *The Planetary Society* (2022), available at <https://www.planetary.org/space-policy/nasa-budget> (accessed 28/10/2022).

⁵³ David M. Harland, 'Constellation program' *Encyclopedia Britannica* (31/12/2019), available at <https://www.britannica.com/science/Constellation-program> (accessed 27/10/2022).

⁵⁴ James Heiser, 'Augustine Committee Issues Final Report on Manned Space Program' *The New American* (23/10/2009); & 'Seeking a Human Spaceflight Program Worthy of a Great Nation' *Review of U.S. Human Spaceflight Plans Committee* (22/10/2009), pp. 9 & 115.

⁵⁵ Joel Achenbach, 'NASA budget for 2011 eliminates funds for manned lunar missions' *Washington Post* (1/2/2010).

⁵⁶ 'S.3729 – National Aeronautics and Space Administration Authorization Act of 2010' *U.S.C. Sec. 304* (2010), available at <https://www.congress.gov/bill/111th-congress/senate-bill/3729/text> (accessed 28/10/2022).

⁵⁷ Rachel Blodgett, 'Our Missions and Values' *NASA* (15/4/2022), available at <https://www.nasa.gov/careers/our-mission-and-values> (accessed 28/10/2022); & Kimberly Amadeo, 'NASA Budget, Current Funding, History, and Economic Impact' *The Balance* (20/1/2022).

in annual revenue as soon as 2025⁵⁸. This figure will also inevitably increase as more people seek the faster broadband speeds provided by the service. Over 60% of NASA's \$180 billion impact originated from commercial products and services; and, whilst NASA's return on investment is impressive, it is not insuperable, as shown by Artemis' failures. Private companies have the ability to extract even more from every dollar, given the sector's cut-throat, Darwinian nature, with only the best businesses thriving. The agency now needs to accept private companies will quickly out-perform it in commercially viable operations.

Nevertheless, NASA's work in support of the private space sector should certainly continue. Since 2010, NASA has spent \$6 billion on commercial crew development, primarily channelled to Boeing and SpaceX⁵⁹. This pales in comparison to the roughly \$250 billion the agency has received in funding across the same period. However, large chunks of the NASA budget have been put into commercially unviable but successful projects, such as the recent James Webb Space Telescope. As such, many believe NASA should step away from missions that can be replaced by the private sector, once the Artemis programme has been completed. However, given delays to Artemis 1, Artemis could continue for much longer than anticipated. At a pivotal time for the space industry, and before Artemis' completion, other nations may have almost closed the technological gap with America, given Artemis' persistence with 20th century concepts. If America intends to maintain its superiority in space, then NASA in its current state cannot continue.

Analysis of the emerging private space industry

In addition to NASA's shortcomings, another compelling argument for a radical shift in how America goes about its operations in space is the meteoric rise of the private space industry. Space-faring nations the world over are increasingly turning to private companies; and, should America fail to react to this change, it will risk losing superiority in the field.

One major private sector success, the work of SpaceX, has been vastly to reduce the cost of launching cargo. Today, launching a spacecraft costs a tenth of a decade ago⁶⁰. This trend looks to continue with the dawn of Starship: a fully-reusable, super-heavy-lift launch vehicle. Another milestone came in 2020 when the Crew Dragon Demo-2 mission saw the first commercially developed rocket ferry astronauts to the International Space Station. SpaceX is also renewing public interest in spaceflight through effective use of livestreaming technology, making each launch an event rather than monotonous.

This newfound private sector feasibility has caught the eyes of the international community. For instance, the United Kingdom has placed a firm focus on the evolution of its private space sector, with 83% of the income from the industry in 2019–2020 deriving from 'direct-to-consumer' and 'business-to-business' sales. Employment in the field also grew by 6.7% from 2018 to 2019. Space tourism in the UK showed the highest percentage growth within the industry, while launch services – one of the main revenue generators for SpaceX – saw the third highest percentage growth. A 2021 UK Space Agency report concluded that the national space sector was 'particularly well poised' to exploit this growth⁶¹.

The United Kingdom also loses around £44 million a year through the European Space Agency. However, this money goes towards valuable research and development, rather than what has been described as NASA's 'jobs programme' and 'means to funnel money to a handful of big aerospace firms'⁶². The structure of the space industry in the UK, with a harmonic balance between private companies and public funding, is a key reason why most organisations expect the sector to grow over the next three years. This stands in stark contrast to America, where there are lingering fears that it will lose the 'vital' space race with China unless there is a more strategic outlook and increased funding from government agencies⁶³. Additionally, a 2021 report which evaluated the space industrial base in America recommended expanding the Artemis Accords beyond NASA. It also presented a space internet, Starlink's ambition, as a major opportunity⁶⁴.

⁵⁸ Trefis Team, 'Is SpaceX Really Worth \$74 Billion?' *Forbes* (16/4/2021).

⁵⁹ 'Why NASA pays SpaceX and Boeing to fly astronauts to the International Space Station' *The Planetary Society* (1/7/2021).

⁶⁰ Bruno Venditti, 'The Cost of Spaceflight Before and After SpaceX' *Visual Capitalist* (27/1/2022).

⁶¹ BryceTech, 'Size and Health of the UK Space Industry 2021' *UK Space Agency* (2021).

⁶² Lewis D. Solomon, *The Privatization of Space Exploration: Business, Technology, Law and Policy* (Abingdon, 2017), p. 3.

⁶³ Theresa Hitchens, 'US space industry 'tactically strong' but lacks long-term investment - study finds' *Breaking Defence*, (18/11/2021).

⁶⁴ J. Olsen, S. Butow, E. Felt, T. Cooley & J. Mozer, *State of the Space Industrial Base 2021* (15/11/2021), pp. 1-2, available at https://assets.ctfassets.net/3nanhbkr0pc/43TeQTAmDYrm5DTrhjd3/a37eb4fac2bf9add1ab9f71299392043/Space_Industrial_Base_Workshop_2021_Summary_Report_-_Final_15_Nov_2021c.pdf (accessed 2/11/2022).

The Chinese commercial space sector has also recently come to increased prominence, as rapidly rising investment since 2016 has seen companies proliferate. In 2018, China became the third nation, after Russia and America, to have a private company develop liquid-oxygen or methane engines; and, with widescale acceptance that space is a growing industry, China is intent on investing more to become internationally competitive⁶⁵. The current fourteenth 5 Year Plan claims ‘efforts will be focused on aerospace, where the country expects to become a global leader in the longer term’, and companies such as OneSpace, iSpace and LandSpace are pioneering this development⁶⁶. China has established over one hundred companies in the private space industry in the last seven years, with fifteen commercial launch companies accounting for half the funding received since 2014. It is also striving to close the technological gap with America⁶⁷.

The Chinese space programme has been criticised by some for not prioritising safety to the same extent as the West, and this criticism resurfaced after a Chinese rocket broke up on re-entry, causing the closure of Spanish airspace in November 2022⁶⁸. Earlier in the year, the NASA administrator Bill Nelson accused China of ‘failing to meet responsible standards regarding their space debris’⁶⁹. However, NASA was fined in the 1970s for littering, after debris hit Western Australia. The Chinese programme is also in its infancy, and it has hardly been two decades since the first Chinese astronaut, Yang Liwei, took off on board a Shenzhou 5 capsule in 2003⁷⁰. Space is difficult to break into, and America and the USSR had their fair share of setbacks when establishing their respective programmes: the Apollo 1 fire, the Challenger disaster, and the Plesetsk Launch Pad disaster to name but three. The Chinese space programme has also been subject to criticism for its opaque military ties. Yet, here too, America is no different, with NASA having a history of cooperating with defence and intelligence agencies⁷¹. Indeed, fraught diplomatic relations between China and the West suggest private companies may be able to collaborate more effectively beyond current geopolitical barriers.

The growing global realisation of the utility of private space companies is also reflected in India and Russia. Russia has vowed to offer ‘unprecedented’ support to these companies in the face of its worst recession since the Soviet Union’s collapse⁷². Moreover, India, with the launch of the India Space Association, is making strides towards the better use of its commercial space industry which, according to a recent analysis, could be worth \$77 billion by 2030. There are also now an estimated 120 active space technology start-ups in the country⁷³.

Conclusion

In conclusion, we are now in an unprecedented position. Around the world, space-faring nations are placing ever more emphasis on private space companies; and, given the Bank of America predicts the space industry will be worth almost \$3 trillion within three decades, this is understandable⁷⁴. In America, this shift is being accelerated by NASA’s inefficiencies, clearly demonstrated by the mess surrounding the Constellation programme. When entrepreneurial minds, including that of Elon Musk, are also developing innovative technologies, it is increasingly difficult to justify the \$24 billion annual budget given to NASA. As such, while the public sector should continue to lead scientific operations in space and stimulate, oversee and support the development of the private industry, commercially viable operations should now be placed in the hands of private companies. Thus, NASA should be replaced with a smaller agency which can work more harmoniously with the emerging private space sector.

⁶⁵ B. Curcio & T. Lan, ‘Analysis: The rise of China’s Private Space Industry’ *Spacenews.com* (25/5/2018), available at <https://spacenews.com/analysis-the-rise-of-chinas-private-space-industry/> (accessed 1/11/2022).

⁶⁶ ‘The 14th Five-Year Plan of the People’s Republic of China - Fostering High-Quality Development’ *Asian Development Bank* (2021), available at <https://www.adb.org/publications/14th-five-year-plan-high-quality-development-prc> (accessed 2/11/2022).

⁶⁷ A. Rana & Y. Joshi, ‘India-China Space Race: The Role of the Private Sector’ *NUS* (27/12/2021), available at <https://www.isas.nus.edu.sg/papers/india-china-space-race-the-role-of-private-sector/> (accessed 2/11/2022).

⁶⁸ Sam Jones, ‘Spanish airspace partially closed as Chinese rocket debris falls to Earth’ *The Guardian* (4/11/2022).

⁶⁹ Davidson, Helen, ‘As space junk falls to Earth, will China clean up its act?’ *The Guardian* (29/7/2022).

⁷⁰ Catherine Collins Peterson, ‘The History of the Chinese Space Program’ *ThoughtCo* (3/5/2018), available at <https://www.thoughtco.com/chinese-space-program-4164018#:~:text=The%20history%20of%20space%20exploration,travel%20by%20the%20late%201950s> (accessed 4/11/2022).

⁷¹ James E. David, ‘NASA’s Secret Relationship With Defence and Intelligence Agencies’ *The National Security Archive* (10/4/2015), available at <https://nsarchive2.gwu.edu/NSAEBB/NSAEBB509/> (accessed 4/11/2022).

⁷² Harsh Vardhan, ‘Russia to support private space companies for satellite launches amid western sanctions’ *republicworld.com* (8/3/2022), available at <https://www.republicworld.com/world-news/russia-ukraine-crisis/russia-to-support-private-space-companies-for-satellite-launches-amid-western-sanctions-articleshow.html> (accessed 2/11/2022).

⁷³ Nikhil Subramaniam, ‘Startups Grab The Spacetechnology Baton’ *Inc42* (16/10/2021), available at <https://inc42.com/features/indian-spacetechnology-startups-ready-to-grab-the-baton/> (accessed 4/11/2022).

⁷⁴ Michael Sheetz, ‘The space industry will be worth nearly \$3 trillion in 30 years, Bank of America predicts’ *CNBC* (31/10/2017), available at <https://www.cnb.com/2017/10/31/the-space-industry-will-be-worth-nearly-3-trillion-in-30-years-bank-of-america-predicts.html> (accessed 4/11/2022).

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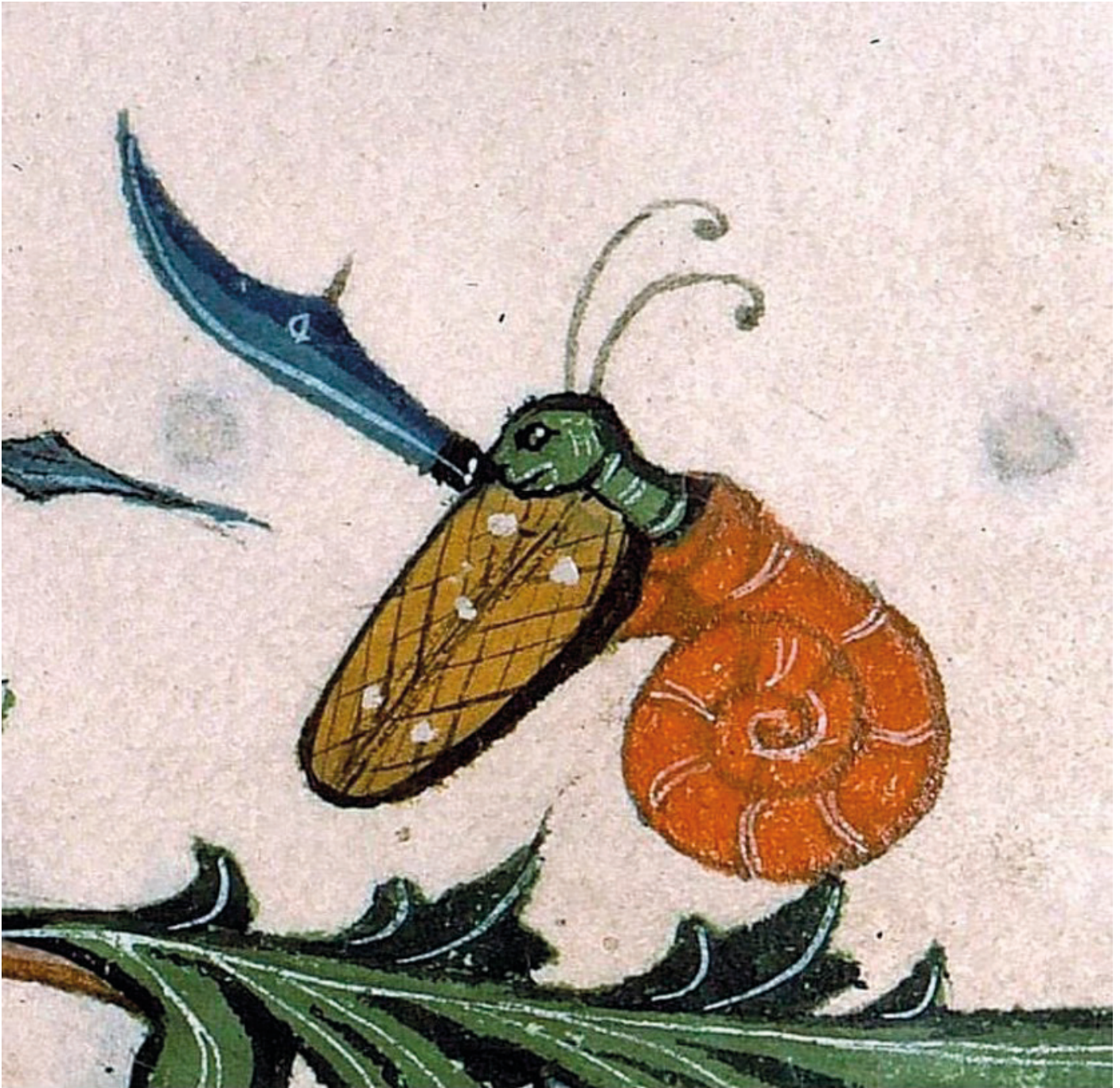
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2: Heretical Runners-Up

'Pray always for all the learned, the oblique, the delicate. Let them not be quite forgotten at the throne of God when the simple come into their kingdom'.
(Evelyn Waugh OL)



'In philosophy if you aren't moving at a snail's pace you aren't moving at all'.
(Iris Murdoch)

14th Century Pontifical of Guillaume Durand
(Bibliothèque Sainte-Geneviève, MS. 143, f. 179v).

The government was right to scrap the Arts Premium initiative.

Rosa Flack



Rosa is studying Mathematics, English Literature and Art at A Level. She has been captivated by the idea of allowing the subconscious to dictate aspects of the creative process, inspired by Cornelia Parker's ink blots. She is hoping to study Architecture at university.

In 2019 the Conservative Party, as part of its election campaign, promised a premium for the arts. 'The arts' encompass theatre, music, dance, film, fashion, design, sport and art; and the Arts Premium package would have raised £270 million in funds to encourage creative skills, ideas and industries. The campaign was to invest in the arts, music and sport to give wider access to a 'rich academic curriculum'. However, the Arts Premium was scrapped because of several factors, including the political climate, the pandemic, Brexit, the war in Ukraine, the fuel crisis and the near collapse of the economy. The government felt they had an obligation to maintain improvements in core subjects instead, especially English, mathematics and the sciences, resulting in a reduction in investment in the arts. Yet was the Conservative Party's radical breaking of this pledge the right decision?

The government believed its decision to redirect taxpayers' money to encourage more 'useful' careers would benefit the economy in the long term. As *The Guardian* reported, the government insisted 'spending for non-prioritised subjects' would be re-directed to areas such as 'nursing and computing'. With our increased reliance on rapidly emerging technologies, it is fundamental that the UK should develop and encourage computing skills to compete on the global stage. Recently, the demand for new technologies has grown extremely rapidly, with accelerating use during the pandemic. The NHS also has staff shortages and is under huge pressure, so naturally the government would wish to plough money into the health service to improve this dire situation. Over seven million people are awaiting treatment, and this can only be tackled with increased funding and employment. Equally, the UK is a world leader in science, with nearly two hundred thousand citable publications in 2020 alone, making the country a top choice for international students. As a country we are perceived to endorse thriving knowledge networks and lead the way in developing vaccinations. With taxpayers' money spread thinly, it is clearly understandable that the government should want to invest in our national health system. However, the set designer Es Devlin has insisted that, whilst we must 'train doctors and nurses in order to maintain our physical national health' our 'cultural health' must also be considered.

The Public Campaign for the Arts announced that the cuts would jeopardise 'a pipe-line of talent' in creative industries, worth £111 billion a year to the economy. Back in February 2020 the artistic industry was growing over five times faster than the national economy. This is evidence that the arts benefit and make a large contribution to the nation. Yet, Dominic Cummings, according to multiple sources, flippantly retorted that 'f***ing ballerinas can get to the back of the queue'. It takes years of discipline and training to become a ballerina, so for a leading adviser to the government to hold such an opinion is insulting, especially as the English National Ballet is one of the foremost touring companies in Europe. This position was also compounded by an appalling advertising campaign, in which the government asked Fatima, a ballerina, to retrain, as her 'next job could be in cyber'. The government is clearly demonstrating a disregard for professions in the arts and does not comprehend the educational and economic value of the creative industries. Therefore, the Conservatives must put an end to this attack on the arts and understand the potential economic power the arts can yield. Many tourists, international students and immigrants are drawn to the cultural wealth offered by the UK. To disregard this is short-sighted and misinformed.

On the other hand, according to the Office for Students, arts courses are extremely 'expensive to teach'. Art requires a wealth of resources to be taught effectively. It is exceedingly time-consuming, with dedicated teachers demanding remuneration in high salaries for their long hours. Therefore, in this time of economic crisis, funding for these requirements is limited. Pieces of art as well as theatrical and musical performances are not of vital importance to our immediate survival. The government even claimed that more funding should be directed to teaching courses for subjects such as medicine and engineering. These courses are essential to our country's advancement in technology, and they will certainly make a genuine difference to people's lives. Yet art teaches us to deal with the world around us and, according to the film director, Alan Parker, is the 'oxygen that makes other subjects breathe'.

The arts, by nature, are a metaphor for the human experience and not everyone can, or wants to, comprehend them. For some they are perceived in a literal sense, and artworks dismissed as mere 'pretty pictures'. Therefore, some may feel their time and money are being wasted on these pursuits, and their money should be better spent on more tangible and immediately accessible endeavours. People who discredit the importance of the connection art has with life will never be assured that it is worthy of their money, regardless of the data saying otherwise. Yet, even the markets believe that investing in art is a 'safe haven' as 'collectors tend to be wealthy'. Therefore, it is 'shielded from the worst of the economic headwinds' according to *The Financial Times*, whose readership traditionally comprises centre-right Tory voters. If art can be sold and brought, it is irrelevant whether one needs to be able to interpret its deeper meaning – it generates money. Let the market choose what the arts are worth, not the government.

A key pledge in the Conservative Party's election campaign was the 'levelling up' agenda. Its aim was to distribute wealth evenly across the country and to invest more in areas of socio-economic deprivation. However, Professor Frances Corner, the Warden of Goldsmiths, University of London, commented that the withdrawal of arts funding 'looks more like "punching down" than "levelling up"'. These cuts would deter those from poorer backgrounds from pursuing artistic ambitions and limit engagement in the arts to the middle classes. Art is a social commentary and if an entire section of society is alienated from participating, this injustice would be reflected in the creative industries. The 'cultural health' of the nation would not be fully realised. Jarvis Cocker, former Pulp frontman, said that this funding deficit would prevent artists 'mixing with people with different ideas' and eradicate 'this cross pollination of stuff that makes things happen'. Art binds together different cultures, ideas and backgrounds into a melting pot of deeper mutual understanding and it has the potential to create something innovative and build closer communities. The Conservatives, consequently, have feigned their commitment to 'levelling up' by scrapping funding to the Arts Premium.

Our nation's mental health problems have rapidly increased through the pandemic. The pandemic triggered a 25% increase in anxiety and depression globally, according to a scientific brief released by the World Health Organisation. In addition, social wellbeing was impacted hugely by the pandemic, due to the lack of mental health specialists and the overall cost of running appropriate health services. During lockdown many people resorted to the arts to assist and give expression to their mental health problems. The artist Tania Bruguera stated that the arts give people 'the opportunity to build certain aspects of themselves, that otherwise will be either ignored, undeveloped or repressed'. Art is a safe space to explore emotions and feelings, to feel connected and supported; and so, surely it would be more beneficial and cheaper for the government to invest in the arts to help tackle the mental health crisis, rather than limiting and hindering its potential to heal. To help a generation overcome the experienced 'trauma' of the pandemic, it is essential that the arts are valued and funded properly, allowing us to forge our cultural awareness and to share social experiences.

To conclude, the arts embrace an entirely different realm of ideas and skills, which define the identity of this nation. In this time of economic concern, investment in science and computing is essential. However, completely downgrading the arts in this way is an attack on the creative potential of our future. Comments made by government officials, degrading the value of the arts are appalling, as is the total disregard for the potential and actual earning power of the arts for the nation's economy. As well as the obvious financial gains of funding the arts, the emotional and internal benefits of studying and contemplating the arts in my opinion are fundamental to human existence. The Russian novelist, Fyodor Dostoevsky, underlined the importance of the arts when stating that 'at first, art imitates life. Then life will imitate art. Then life will find its very existence from the arts'. As a society, we are constantly surrounded by the arts and encounter them on a continual basis. Most people do not comprehend the huge role the arts play in our daily lives. The government, rather than scrapping and isolating the arts, should be maintaining its investment in the creative industries so the arts can be more accessible and supported. I firmly believe that the government was mistaken in scrapping the Arts Premium initiative.

Modern skyscrapers need redesigning: here's why.

Zain Fletcher



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In the modern world skyscrapers have become iconic aspects of most city skylines. They are vast towers of concrete, glass and steel, reaching high into the air as architectural masterpieces, the tallest being world-famous icons such as the Empire State Building and the Burj Khalifa⁷⁵. However, they are far from perfect. Steel and concrete, two of the most important materials used in modern skyscrapers, contribute roughly 9% to all global emissions, and the sheer amount of glass in most skyscrapers can roast those inside when the air conditioning fails. On top of this, better use can be made of skyscrapers. Projects such as Billionaires' Row in New York contribute little to the needs of the common person. So, what other problems do these skyscrapers face, and how can we fix them? Are modern skyscrapers really made for functionality, or are ego and money the real motivations?

Firstly, why are skyscrapers so popular? One of the main reasons is that they can become icons for almost any city's skyline. London, for example, has the Shard, the Gherkin (30 St Mary Axe) and the Walkie Talkie (20 Fenchurch Street)⁷⁶. In fact, many of the world's most famous landmarks, such as the Empire State Building, are skyscrapers too. They often make a city seem more modern and attractive to businesses and potential residents, offering dreams of living and working high in the sky in marvels of modern ingenuity and technology. It is also notable that skyscrapers, because of their size, can contain many facilities within a small footprint, from retail to restaurants, hotels, apartments and offices. The most iconic ones in turn become popular tourist attractions, like the Tilt Observation Deck on the 94th floor of Chicago's Willis Tower⁷⁷. Skyscrapers can also be essential to a city's growth. New York (specifically Manhattan) would be unimaginable without its skyscrapers, and removing them would destroy hundreds of acres of office and living space. Finally, skyscrapers are becoming easier to construct. High volume steel production techniques, such as Henry Grey's wide-flange rolling process, make mass steel production more efficient, and the use of scrap steel can make it more available in a sustainable form⁷⁸. However, while sourcing steel sustainably reduces greenhouse gas emissions, and increases the amount of steel produced, it doesn't solve all the environmental problems.

Steel frames were what made skyscrapers possible in the first place; while cement, the main ingredient of concrete, is the second most consumed product in the world after water. However, these two materials are responsible for a significant proportion of the world's carbon dioxide emissions, with cement itself contributing 4 billion tonnes of emissions annually⁷⁹. Meanwhile, most steel is still produced with coke, mainly produced from the fossil fuel coal⁸⁰. Things may be getting better, but not fast enough: we are still not on track for zero emissions by the 2030 target, vital to keeping global warming below a 2 degree Celsius rise. While action is being taken to reduce emissions for steel, including the development of clean hydrogen-based steel manufacturing, such new technologies still need time to develop and are likely to be expensive. As a consequence, we should spend time looking into alternatives⁸¹. The trouble is, who will do the looking?

⁷⁵ 'Burj Khalifa' *Wikipedia*, available at https://en.wikipedia.org/wiki/Burj_Khalifa (accessed 24/10/2022).

⁷⁶ 'Privacy Notice' *The Gherkin*, available at <https://thegherkin.com/cookies/> (accessed 24/10/2022); & '20 Fenchurch Street' *Wikipedia*, available at https://en.wikipedia.org/wiki/20_Fenchurch_Street (accessed 24/10/2022).

⁷⁷ 'Tilt' *360 Chicago: A Magnicity Experience*, available at <https://360chicago.com/tilt> (accessed 25/10/2022).

⁷⁸ Shelley C. Finnigan et al., 'Materials: Steel and Skyscrapers: A Productive History and a Sustainable Future' *CTBUH Journal* no. 4 (2019), pp. 28–35.

⁷⁹ Keegan Ramsden, 'Cement and Concrete: The Environmental Impact' *PSCI* (3/11/2020), available at <https://psci.princeton.edu/tips/2020/11/3/cement-and-concrete-the-environmental-impact> (accessed 24/10/2022 & 25/10/2022).

⁸⁰ 'Iron and Steel – Analysis' *IEA* (Sept. 2022), available at <https://www.iea.org/reports/iron-and-steel> (accessed 25/10/2022).

⁸¹ Michael Pooler, 'Cleaning up steel is key to tackling climate change' *Financial Times* (1/1/2019), available at <https://www.ft.com/content/3bcbcb60-037f-11e9-99df-6183d3002ee1> (accessed 24/10/2022 & 25/10/2022); & 'Skyscraper' *Wikipedia*, available at <https://en.wikipedia.org/wiki/Skyscraper> (accessed 25/10/2022).

Glass is the main ingredient behind the creation of the futuristic feel to skyscrapers, enabling the awesome views so many desire. It is also temperature resistant and helps introduce an abundance of natural lighting into a room. Modern techniques make it versatile, allowing it to be formed into many different shapes⁸². However, all these positives don't free the material from its flaws. Firstly, while glass may not be as thermally conductive as a metal like copper, something like a thermally insulated brick wall can easily retain more heat than even a triple glazed glass window. High-rise buildings already use two and a half times more energy per square metre of floor energy than low rise-buildings; and most non-skyscraper buildings use a larger variety of outer-wall materials, making glass skyscrapers very energy inefficient. Furthermore, glass walls can turn skyscrapers into what might as well be greenhouses by magnifying the sun's radiation, forcing their owners to spend more money on air conditioning. This supports global warming, making skyscrapers without air conditioning even hotter⁸³. In turn these problems are amplified by the height of skyscrapers, making them difficult to ventilate.

Additionally, architects have to take huge care when designing glass-heavy skyscrapers, because if designed incorrectly they can threaten public safety, as with the Walkie Talkie⁸⁴. During the skyscraper's construction in 2013, it began to reflect the sun in such a way as to damage property. Part of a hairdresser's front carpet was scorched, paint on the building bubbled up and a plastic lemon was damaged, its top developing small white lumps. The tiles in front of a Vietnamese restaurant fell off, after the grout dried out, and parts of a Jaguar car were melted⁸⁵. This meant three parking spaces surrounding the Jaguar had to be blocked off, and the skyscraper's owners had to pay almost £1,000 in damages⁸⁶. It seems ridiculous that Rafael Viñoly, the experienced architect behind the skyscraper, had made such a disastrous design oversight. However, the man seems to have a way with glass: specifically, how to heat things with it, normally in all the wrong ways. The Walkie Talkie is also known for heating those inside, as well as what is outside. Viñoly's decision to give the building the curve responsible for these problems was also unnecessary and just a means to increase rent at the top of the tower⁸⁷. The Gherkin also shed a window in 2005 and the Hancock Tower developed a similar problem: a trait not unique to these towers. Clearly, glass is not used for efficiency or safety, but to secure an extra income stream from pretty views⁸⁸.

Skyscrapers also aren't exactly cheap places to live. A studio or one bed apartment can set you back hundreds of thousands of dollars in Manhattan, with the best apartments costing millions, even tens of millions. In Manhattan, this would seem normal, as land is very expensive; and less well-known cities certainly have lower prices. Yet, there is a problem. Skyscrapers can be used for so much more. They can host retail and are commonly used as hotels and offices; and, even then, having them only serve wealthier companies and people is unnecessary. High prices can lead to a skyscraper being unused, occupying a location which might be better used for something far more valuable. Billionaires' Row, for instance, is an engineering tour de force, with a set of thin towers in close proximity, but serves little purpose. Each tower contains one unnecessarily expensive apartment per floor; and roughly half the apartments, although owned and using energy, are empty. Furthermore, the residents, exploiting various loopholes, pay little tax. Billionaires' Row is not a place to live, but a property investment in which to store expensive artwork. It is not housing, something which should be the right for all⁸⁹. Let's take Viñoly's 432 Park Avenue. Viñoly claims architecture is about functionality, and this holds true for his non-skyscrapers. But if true for his skyscrapers, why contribute to Billionaires' Row, a vehicle for the rich to

⁸² Michael Tobias, 'Why is Glass so Common in Commercial Buildings?' *Nearby Engineers*, available at <https://www.ny-engineers.com/blog/why-is-glass-so-common-in-commercial-buildings#:~:text=Glass%20can%20absorb%2C%20refract%20or,open%2C%20with%20abundant%20natural%20lighting>. (accessed 25/10/2022).

⁸³ Jeremy Plester, 'Weatherwatch: glass skyscrapers are worst energy offenders' *The Guardian* (30/9/2019), available at <https://www.theguardian.com/environment/2019/sep/30/weatherwatch-glass-skyscrapers-are-worst-energy-offenders#:~:text=Guardian%20Pick,health%20hazard%20in%2010%20years> (accessed 24/10/2022 & 26/10/2022).

⁸⁴ 'Everyone needs to stop building giant glass skyscrapers right now' *Wired* (11/11/2019), available at <https://www.wired.co.uk/article/stop-building-glass-skyscrapers> (accessed 24/10/2022 & 26/10/2022).

⁸⁵ 'Walkie-Talkie skyscraper melts Jaguar car parts' *BBC News* (2/9/2013), available at <http://www.bbc.co.uk/news/uk-england-london-23930675> (accessed 26/10/2022).

⁸⁶ 'This London skyscraper can melt cars and set buildings on fire' *NBC News* (3/9/2013), available at <https://www.nbcnews.com/science/london-skyscraper-can-melt-cars-set-buildings-fire-8c11069092> (accessed 26/10/2022).

⁸⁷ 'Rafael Viñoly' *Wikipedia*, available at https://en.wikipedia.org/wiki/Rafael_Vi%C3%B1oly (accessed 4/11/2022).

⁸⁸ Martin Wainwright, 'Gherkin skyscraper sheds a window from 28th storey' *The Guardian* (26/4/2005), available at <https://www.theguardian.com/society/2005/apr/26/urbandesign.arts> (accessed 4/11/2022).

⁸⁹ 'Why New York's Billionaires' Row is Half Empty' *Youtube*, available at <https://www.youtube.com/watch?v=Wehsz38P74g> (accessed 26/10/2022); & 'Billionaires' Row (Manhattan)' *Wikipedia*, available at [https://en.wikipedia.org/wiki/Billionaires%27_Row_\(Manhattan\)](https://en.wikipedia.org/wiki/Billionaires%27_Row_(Manhattan)) (accessed 26/10/2022).

avoid tax and store art? I believe he did so just to have a super-skinny skyscraper on his resumé. After all, if you can create an engineering marvel, why care about its purpose? In an interview with the *Architectural Digest*, Laura Rottet, designer of the Central Park Tower, similarly gave no consideration to how her skyscraper might benefit people. She just talked about the care taken over its design, and how luxurious and amazing it was. The skyscraper was an ego trip, and similar projects undoubtedly serve comparable functions⁹⁰.

So, how can we fix these skyscrapers, and how much must such egocentrism and greed be tackled?

Firstly, we must deal with the issue of unsustainable building materials. After all, if we want these buildings to be ecologically friendly, we must reduce the ecological footprint needed to produce and maintain them⁹¹. We can, for instance, reduce the need to maintain skyscrapers by making them from self-healing concrete, as developed by Dr Jonkers in 2017. This self-healing concrete, by using bacteria, can last for up to two hundred years. It is also now commercially available as a spray to reinforce existing concrete, especially effective for infrastructure in a marine setting⁹². A company called Solidia has also developed a cement produced with less energy, raw materials and carbon dioxide emissions⁹³. As such, the combination of Solidia cement and Jonkers' spray could greatly reduce skyscrapers' negative environmental impact.

Soon, however, to reduce emissions further, skyscrapers will be able to be made from cross-laminated timber (CLT) not concrete. This has an alternating grain, as strong and fire resistant as steel. It is a lighter building material and can store carbon-dioxide⁹⁴. Timber, when harvested sustainably, is also a great way to produce low-carbon emitting building materials. Indeed, most deforestation occurs only when creating farmland for livestock and crop plants, not through harvesting timber. Most CLT skyscrapers are for now only conceptual, but CLT high-rise buildings do exist, and there are plans in Japan to make a seventy-story 90% timber skyscraper by 2041. Building with timber has also been shown to be more efficient than with concrete. It reduces stress among the buildings' users and there is now the possibility that planks might be bonded together at the molecular level⁹⁵. With these new methods, we may well be able to use architects' egos to our advantage. The architect who builds the tallest wooden skyscraper, or the first to construct one from self-regenerating concrete, is bound to go down in history. The only problem is that we must stop it becoming another Walkie Talkie or Central Park Tower. We can't rest our hopes solely on using an architect's ego as a driving force for good in case greed then strikes.

There are also better ways to utilise skyscrapers, for example in the ongoing housing crisis. Homelessness amongst young people is increasing due to soaring house prices, along with the rising cost of living⁹⁶. While skyscrapers may not be able to attack the core of these problems, they can ease their effects. At the base of skyscrapers, where floorspace is cheaper, we could create apartments for social housing. For those sleeping rough and unable yet to find accommodation in social housing, homeless shelters could also be built to provide a place to eat and sleep safely.

⁹⁰ 'High Rise Apartments in Manhattan For Sale' *NestSeekers International*, available at <https://www.nestseekers.com/Sales/manhattan/high-rise> (accessed 26/10/2022); & Mayer Rus, 'A Look Inside the Luxurious Interiors of a Billionaires' Row Supertall' *Architectural Digest* (23/5/2022), available at <https://www.architecturaldigest.com/gallery/inside-luxurious-interiors-billionaires-row-supertall> (accessed 4/11/2022).

⁹¹ Simon Guy & Graham Farmer, 'Reinterpreting Sustainable Architecture: The Place of Technology' *Journal of Architectural Education* vol. 54 no. 3 (2001), pp. 140–48.

⁹² David Cartwright, 'Bio-concrete: Is This The Future Of Construction?' *Buildsoft* (7/10/2019), available at <https://www.buildsoft.com.au/blog/bio-concrete-is-this-the-future-of-construction#:~:text=Bio%2Dconcrete%20is%20proving%20to,projects%20and%20handling%20costly%20repairs>. (accessed 29/10/2022); & Rosie Spinks, 'The self-healing concrete that can fix its own cracks' *The Guardian* (29/6/2015), available at <https://www.theguardian.com/sustainable-business/2015/jun/29/the-self-healing-concrete-that-can-fix-its-own-cracks> (accessed 29/10/2022).

⁹³ *Solidia*, available at <https://www.solidiatech.com/> (accessed 29/10/2022).

⁹⁴ 'Wooden skyscrapers: Sustainable homes of the future?' *Youtube*, available at <https://www.youtube.com/watch?v=raW7j1tUTEI> (accessed 29/10/2022).

⁹⁵ 'Wooden Skyscrapers Are On The Rise – Cheddar Explains' *Youtube*, available at https://www.youtube.com/watch?v=Zy_ahwS14Gg (accessed 29/10/2022).

⁹⁶ 'Cost of living: Dorset homeless charity demand soars' *BBC News*, available at <https://www.bbc.co.uk/news/uk-england-dorset-63242080> (accessed 29/10/2022); & 'Homeless US student population "highest in more than a decade"' *BBC News*, available at <https://www.bbc.co.uk/news/world-us-canada-51370060> (accessed 29/10/2022).

However, it doesn't end there. Even when building greener skyscrapers, there will always be the problem of taking land away from natural habitats. However, vertical forests can help resolve this problem. Currently, only the architect Boeri has built vertical forests; and, in Milan there are two prototype towers, one already reaching skyscraper size at 112 metres high, and the other 80 metres tall⁹⁷. Here, the trees and plant life absorb carbon dioxide, providing a home for birds and regulating the humidity and temperature of the building. The plants certainly require human maintenance, but this helps create more jobs. Boeri has also built a social housing vertical forest in Eindhoven in the Netherlands, showing towers of any purpose can be made into forests. Moreover, if timber skyscrapers end up being successful (as is likely), then it would not be uncommon to find vertical forests incorporated into their design. After all, many timber skyscraper concepts already have plant life within their structure⁹⁸.

However, despite the benefits of vertical forests, there are still very few of them. Might this be because architects' egos find little attraction in just developing a valuable but pre-existing idea, which does not allow them the plaudits of being first off the block? It is also possible today to use the heating effects of glass to create greenhouses at the top of skyscrapers to provide residents with small community gardens, to allow them to be more self-sustainable. In fact, I am certain there are many further uses for skyscrapers, from integrated libraries to community areas and places of worship. Indeed, if an architect like Viñoly could take the public benefits of his non-skyscrapers and translate them into his towers (after fixing his incompetence with glass), he would seriously improve the lives of many. After all, with enough human ingenuity and co-operation, the sky's the limit.

To conclude, skyscrapers do have value and are likely to become an essential part of modern living in the future. They will be able to complement advancing technologies and be built in response to need. As such, we must stop building so many skyscrapers using current methods. We may be able to use ego and money to our advantage, promising architects great projects like the tallest wooden, or skinniest regenerating skyscraper. However, the world of skyscrapers needs more humility in general truly to create what's best for humanity. While it is unlikely that you'll be put into the history books just for building social housing, it is a necessary undertaking and should still be done. After all, skyscrapers should benefit everybody, not just the wealthy and those who build them.

⁹⁷ 'Vertical Forest Milan' *Stefano Boeri Architetti*, available at <https://www.stefanoboeriarchitetti.net/en/project/vertical-forest/> (accessed 30/10/2022 & 4/11/2022).

⁹⁸ 'Could vertical forests improve our cities and health?' *BBC World Service Youtube*, available at <https://www.youtube.com/watch?v=-MFnHT-x1Ak> (accessed 30/10/2022).

The NHS should spend less money on drugs and more money on music.

Marnix Harman



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In 2020/21 the NHS was estimated to have spent £16.7 billion on drugs in England alone. Along with this, drugs are known to have many bad side effects. As an alternative, I think the NHS should invest in different methods to drugs. For instance, high blood pressure affects many people, as well as significantly impacting the NHS, and musical therapy is an alternative treatment which could become a highly effective replacement for drugs.

What is blood pressure?

Blood pressure is an essential part of the human body. It is the pressure of the blood flow on the walls in the arteries⁹⁹. It is crucial to our bodies, as we need blood pressure to let blood flow through our circulatory system to carry oxygen to our organs. Blood pressure is measured in two readings. The systolic blood pressure is the maximum pressure during a heartbeat, whereas the diastolic blood pressure is the minimum pressure between two heartbeats. This is normally expressed as the systolic blood pressure over the diastolic blood pressure and is measured in millimetres of mercury¹⁰⁰.

The body controls blood pressure through a variety of organ systems. These include the central nervous system, cardiovascular system, kidneys and adrenal glands¹⁰¹. Through a complex communication between these systems the body is able to regulate its blood pressure. Receptors in the walls of the arteries respond to a change in blood pressure and send this information to the nervous system. The nervous system responds through either the parasympathetic system, which decreases blood pressure, or sympathetic nervous system, which increases blood pressure. The parasympathetic nervous system has also been called 'the rest and digest response' and the sympathetic nervous system is also known as the 'fight or flight response'. In short, stimulating the parasympathetic system relaxes the body and the sympathetic system prepares the body for action¹⁰².

Blood pressure can fluctuate in different circumstances. Engaging in exercise causes the heart's systolic blood pressure to rise for a brief time. This is because the body's muscles require more oxygen to carry out aerobic activities than when the body is resting¹⁰³. Blood pressure will lower when the body is in a state of relaxation as it does not need the same amount of oxygen as when engaged in vigorous exercise.

Blood pressure is influenced by many aspects, such as heart rate, the volume of blood going through the heart per minute and the stiffness of the arteries. A person's emotional state, activity, and health or frailty can affect these parameters. Continuous stimulation of the sympathetic system can lead to persistent hypertension.

Hypertension and prevalence

The blood pressure in a healthy adult is on average around 120/80 mmHg¹⁰⁴. We talk about high blood pressure (hypertension) if someone's blood pressure on average is above 140 systolic or above 90 diastolic. Hypertension

⁹⁹ 'High Blood Pressure' *British Heart Foundation*, available at

<https://www.bhf.org.uk/informationsupport/risk-factors/high-blood-pressure>.

¹⁰⁰ 'Blood Pressure' *Wikipedia*, available at https://en.wikipedia.org/wiki/Blood_pressure.

¹⁰¹ Thomas M. Coffman & Steven D. Crowley, 'Kidney in Hypertension' *Hypertension* (10/3/2008), available at <https://www.ahajournals.org/doi/full/10.1161/HYPERTENSIONAHA.105.063636>.

¹⁰² 'Control of Blood Pressure' *Teach Me Physiology*, available at

<https://teachmephysiology.com/cardiovascular-system/circulation/control-blood-pressure/>.

¹⁰³ 'What happens to blood pressure during exercise?' *Aktiia* (20/1/2022), available at <https://aktiia.com/uk/blood-pressure-during-exercise>.

¹⁰⁴ 'Blood Pressure' *Wikipedia*, available at https://en.wikipedia.org/wiki/Blood_pressure.

carries many risks for the human body. It can cause diseases such as strokes, heart disease, dementia and kidney failure.

Around one in three adults in the UK have high blood pressure. In England, 31% of men and 26% of women have high blood pressure. In the UK, high blood pressure is the third biggest risk factor for all disease after smoking and poor diet. Each 2 mmHg rise in systolic blood pressure is associated with a 7% increased risk of death from coronary heart disease and a 10% increased risk of death from stroke. High blood pressure was responsible for approximately 75,000 deaths in the UK in 2015. Reducing the average systolic blood pressure of the nation by just 5 mmHg over 10 years would save £850 million in NHS and social care spending. High blood pressure accounts for 12% of all GP appointments in England.

Current treatment for high blood pressure

It is important to treat hypertension because it is the main cause for numerous debilitating illnesses and has a high mortality rate. It also saves money for the NHS to treat a patient with earlier hypertension rather than if their hypertension has led to a stroke or a heart attack. This will be much more expensive and obviously worse for the patient. Having high blood pressure is also one of the most easily treatable diseases. Treating hypertension reduces the chances of a stroke by an average of 35%–40%, of a heart attack by 20%–25% and heart failure by more than 50%.

There are many different types of antihypertensive agent, which work in different ways and affect different organs involved in blood pressure regulation. Some work on the kidneys, others work directly on the heart muscle, some affect the muscles within the arteries and another group affects the brain. As a result, some remove extra fluid and salt from the body. Others relax and widen the blood vessels or slow the heartbeat¹⁰⁵. Antihypertensives that work through the brain are called central acting antihypertensives. These drugs block signals that increase heart rate and narrow blood vessels. By blocking these signals the blood doesn't pump as forcefully and blood flows more easily through the body's veins and arteries¹⁰⁶.

However, antihypertensives have side effects. Sometimes the body needs the blood pressure to increase, for example when doing exercise. If the blood pressure is too low, or prevented from going up, side effects such as dizziness, tiredness and headaches are reported. Blood pressure tablets working directly on the kidneys can cause kidney failure. Other common side effects are coughs, diarrhoea, nausea and vomiting, as well as other less common side effects. High blood pressure costs the NHS over £2.1 billion every year and 50–80% of people with high blood pressure do not take all their prescribed medication¹⁰⁷. Undiagnosed hypertension is extremely common and believed to be 54.2% among male patients and 46.7% in female patients, the latter counting for more than five million people¹⁰⁸.

The effects of music on blood pressure

Both music making and listening to music have been proved to impact upon the nervous system's activity. Repeated engagement with musical therapy, including listening to and making music, has been linked to a positive shift towards increased parasympathetic activity (a lowering of blood pressure). Listening to music has caused measurable changes in reducing heart rate, blood pressure and plasma stress hormones¹⁰⁹. Research has shown that music has several effects on the brain. According to *The Indian Heart Journal* (May 2012), a meta-analysis compared a handful of studies which investigated the effects of music on the body's systolic blood pressure, diastolic blood pressure, heart rate and self-diagnosed anxiety. The analysis showed strong evidence that

¹⁰⁵ 'Antihypertensive agent' *National Cancer Institute*, available at <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/antihypertensive-agent>.

¹⁰⁶ 'Central-acting agents' *Mayo Clinic*, available at <https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/in-depth/high-blood-pressure-medication/art-20044451>.

¹⁰⁷ 'Blood pressure facts and figures' *Blood Pressure UK*, available at <https://www.bloodpressureuk.org/news/media-centre/blood-pressure-facts-and-figures/>.

¹⁰⁸ 'Examining the prevalence, correlates and inequalities of undiagnosed hypertension in Nepal: a population-based cross-sectional study' *BMJ Open*, available at <https://bmjopen.bmj.com/content/10/10/e037592>.

¹⁰⁹ J. Matt McCrary & Eckart Altenmüller, 'Mechanisms of Music Impact: Autonomic Tone and the Physical Activity Roadmap to Advancing Understanding and Evidence-Based Policy' *Perspective* (27/8/2021), available at <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.727231/full>.

those who received music therapy had a significantly greater decrease in blood pressure than those who did not receive musical therapy¹¹⁰. Another study said that listening to Mozart and Strauss for 25 minutes lowered systolic rates by 4.7 mmHg and diastolic rates by 3.7 mmHg¹¹¹. It can decrease the risk of a major cardiac event by 10%¹¹². This is from only 25 minutes of listening to calming music.

We aren't entirely sure why music lowers blood pressure. However, the best theory is that calming music stimulates the parasympathetic nervous system, which subsequently lowers blood pressure. The brain stem is involved in sound processing and is also known for controlling heart rate and breathing. This could be a reason why music lowers heart rate, breathing and blood pressure as well as pain, stress and self-reported anxiety¹¹³. There is also some research that suggests that uplifting and pleasurable music (such as ABBA) can stimulate the sympathetic nervous system, which increases blood pressure. However, after listening to this type of music, there is a disproportionate increase in parasympathetic activity, which overall decreases blood pressure. Normal stress induced sympathetic activation, such as a stressful job, does not lead to a significant increase in parasympathetic activity after the stress event, compared to parasympathetic activity after listening to uplifting music¹¹⁴. Musical therapy has many other benefits such as having no side effects as well as being cheap and accessible for everyone.

Discussion

It is obvious that musical therapy cannot and will not be able to replace antihypertensives. In general, drugs are able to lower people's blood pressure more effectively and I think that people with serious hypertension should use drugs. However, I think that those with less serious hypertension and those who are undiagnosed (everyone!) should use musical therapy as it is much cheaper and could prevent many people getting worse. Not having to use drugs would save the NHS millions of pounds a year. Another major advantage is that music causes no side effects. Listening to music is also something enjoyable and if the NHS spent even a fraction of its budget on the music industry it could give many jobs for musicians in hospitals.

Music could also go along with antihypertensives. We know that it is often necessary to use more than one pill to reach an acceptable blood pressure. In fact, research has shown that 23%–52% of patients need three pills or more to treat their blood pressure¹¹⁵. I think that if music was used as a first line treatment, some patients might need fewer drugs compared to without musical therapy, leading to less cost and less side effects.

¹¹⁰ Rohit S. Loomba & Rohit Arora, 'Effects of music on systolic blood pressure, diastolic blood pressure, and heart rate: a meta-analysis' *Indian Heart Journal* (May 2012), pp. 309-313, available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3860955/>.

¹¹¹ 'The Cardiovascular Effect of Musical Genres' *Aerzteblatt.de*, available at <https://www.aerzteblatt.de/int/archive/article?id=179298>.

¹¹² 'Maybe a 5mm HG Reduction in Systolic BP is enough?' *5MinuteConsult Journal Club*, available at <https://5minuteconsult.com/public/5mmHGredution>.

¹¹³ 'How music may affect your heart' *Harvard Health Publishing*, available at <https://www.health.harvard.edu/heart-health/tuningHa-in-how-music-may-affect-your-heart>.

¹¹⁴ J. Matt McCrary & Eckart Altenmüller, 'Mechanisms of Music Impact: Autonomic Tone and the Physical Activity Roadmap to Advancing Understanding and Evidence-Based Policy'.

¹¹⁵ 'Analysis of second- and third-line antihypertensive treatments after initial therapy with an angiotensin II receptor blocker using real-world Japanese data' *Hypertension Research* (28/7/2016), available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5506243/>.

Should you have to pass a mental competence test to be eligible to vote?

Grace Murray



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In the UK and the USA citizens must meet only limited criteria to vote, with only those under 18 or those convicted of crimes excluded from voting. Assuming neither condition applies, one just has to register to vote to have a say in one's country's future. Registration is compulsory in general and local government elections, and there are no parameters concerning mental ability or educational level to dictate who can and cannot vote. Such a system is widely questioned as the best means to effective government. However, suggestions that we should have a competency test to gain the right to vote beg significant questions. What would be tested? How would it be tested and how would a pass mark be set?

A common suggestion is an official, government mandated IQ test. An IQ test gives those who take it a standardised score, indicating how far above or below their peer group they stand in mental ability. The term is derived from the German word *Intelligenzquotient* and was coined by the psychologist William Stern in 1912. At the time, IQ was measured as an individual's mental age divided by their chronological age, but in more modern times tests have compared an individual's performance against the distribution of test scores. In the light of David Wechsler's work, testing has also now come to use statistical properties of the normal distribution to assign IQ scores based on the percentage of contemporaries outscored. However, although psychologist-approved IQ tests, such as the Stanford-Binet test or Cattell test, can give extremely accurate results, the internet is overflowing with inaccurate ones, providing completely false data.

Another suggestion is a political literacy test, as used in the south of the United States in the 19th century. This would involve questions relating to government and law, as well as political parties and their candidates. It would be standardised across the nation and be strictly regulated by state or federal officials. Who would write the test, and decide how it was marked, would also have to be carefully regulated to ensure testing was completely neutral and objective.

One of the most common arguments for compulsory testing is to ensure those in power do not have to dumb down their politics for mass consumption. The global average IQ is 100, whereas that of world leaders is between 120 and 125. This gap, whilst appearing small, represents a potentially huge difference in cognitive ability; and, given a percentage of those with higher IQs will be politicians, the concentration of those with low IQs will be larger still amongst the voters. Yet, if political literacy testing were made compulsory, politicians could rely on their voters understanding (at least most of) what they were saying. They would then be less likely to over-simplify policies to gain the attention of voters, in ways easily misunderstood. Testing would certify voters understood both the political terminology and policies at stake. Politicians could then focus on articulating their policies, rather than trying to appeal emotionally to those unable to understand their arguments intellectually. Furthermore, if IQ tests were made compulsory for voters, those in government would also have to take them, letting voters know whether candidates for government could in fact lead the country.

Citizens have also been socially conditioned to think they should vote, even if they do not actually know what they are voting for. Around one third of Americans cannot name one of the three branches of the US government, and only half of the entire US population knows each state has two senators. At the same time, people have been led to believe that, although they 'should' vote, their vote will not influence the country's future. As such, they see no need to understand the truth of that for which they are voting. Why not indulge in what you want to believe rather than the truth, if you have no power? In fact, many people cast their vote based on the candidate they find most entertaining or aesthetically appealing. However, if literacy or competency tests were introduced, citizens would be more motivated to find out about the operation of government and its institutions. They would also value their vote more. In theory, this would lead to citizens casting their votes more wisely, giving proper consideration to issues affecting them. It should also mean voters would be equipped to look at macro issues influencing their country as a whole, rather than just responding to localised issues directly impacting upon them.

The fact that as a society we see nationwide votes as necessary for decision making shows we value good over fair decisions. If fairness was our paramount concern, we would make decisions by the flip of a coin so both sides could have a 50% chance of winning. So, if we value good decisions, why not have a system that makes them more often? David Estlund, author of *Democratic Authority*, suggests an epistocracy: a government controlled by the knowledgeable. This would mean only those who understand what is happening can vote, so decisions impacting upon the whole country would be made by more educated, intelligent people. The political philosopher, Jason Brennan supports Estlund's suggestion, saying it is entirely justifiable to limit the political power 'the irrational, the ignorant and the incompetent' hold over others. In the 19th century, J. S. Mill also suggested giving extra votes to citizens with university degrees, with their supplementary votes acting as a defence against ignorance. A higher IQ directly correlates to educational achievement, and those who are more educated are more likely to be more up-to-date politically and make more informed, rational decisions. Indeed, it is estimated that the naturalisation test, which immigrants must pass to register to vote, would be failed by 50% of voters, even though only 60% is needed to pass. If you can't answer basic questions about your own country, then why should you be allowed to decide its fate? This test is especially relevant, given the discriminatory fact that immigrants have to pass it, but those born in the country don't.

Many of the most famous philosophers, such as Plato and his teacher Socrates, have believed society should be led by the educated and only the intellectually superior should vote or be in government. In Plato's *Republic* Socrates insisted voting was a skill, not just a random privilege everyone should be granted. He believed only those who could effectively use this skill should be given the opportunity to practise it. For Socrates, speaking of the uneducated being granted the vote, 'letting them choose their leader is like letting them sail the ship in the storm'. Socrates believed in an intellectual democracy rather than democracy by birth-right, because he knew how easily those who wanted to be elected could exploit our desire for easy answers, even if these would not play out well in real life. Plato believed the average citizen was shifty, unreliable and incompetent and, if given the opportunity to vote, would vote for whoever took their fancy at that moment in time, rather than the best candidate for the job. For him power should only be entrusted to the educated.

However, many believe that under no circumstance should anyone be required to pass a competency test to vote. History has shown that moves to disenfranchise sections of the population have led to the undermining of basic human and civil rights, and a lack of representation. In fact, the US Voting Rights Act of 1965 prohibits any state from imposing a 'voting qualification or prerequisite to voting, or standard, practice or procedure to deny or abridge the right of any citizen in the US to vote on account of race or colour'. It is illegal to deny anyone the vote based on physical characteristics or qualifications. Even so, the Republican politician Ann Coulter believes there should be a literacy test and poll tax. However, in the US poverty (and therefore lack of access to good education) disproportionately affects black people, making it more likely that they would fail the literacy test, skewing the composition of the voting public and so entrenching racism and discrimination. The introduction of a literacy test could also encourage the prohibition of other minority groups from voting. This would set nations back hundreds of years, allowing a 'legal' suppression of voters. Former Republican Congressman Tom Tancredo's statement at the 2010 National Tea Party Convention is a clear warning: 'we do not have a civics literacy test before people can vote. People who could not even spell the word "vote" or say it in English put a committed socialist ideologue (Obama) in the White House'. This illustrates how a literary competency test could be exploited regressively in a deeply divided political landscape.

In fact, in 1960s Louisiana literacy tests were used to disenfranchise black voters. The literacy test, supposedly administered equally to black and white voters unable to prove a certain level of education, was disproportionately administered to black voters. Most state mandated tests were trivia questions about civic procedure and citizenship, but the Louisiana test had nothing to do with citizenship. The questions were intentionally made to be unanswerable, and whether a question was marked correct or incorrect was decided by the registrar. Harder questions were used to discriminate against minority groups. Indeed, in 1868, after literacy tests were introduced for voting in New York, a New York Democrat powerfully argued 'if a man is ignorant he needs the ballot for his protection all the more'. If people are deemed uneducated and ignorant then they will need the support of governmental systems, which will not be provided if only people who do not need such help can vote. For instance, if the average blue-collar worker has a low IQ and is prohibited from voting, then politicians will have no incentive to protect the most vulnerable, less educated and poorer sectors of society. It would probably also lead to the gap between rich and poor widening, leading to an even more unequal society.

The question of how IQ can even be tested is also a major problem. How could you reliably measure the IQ of every potential voter in the country? What should the pass mark be? For the test to be consistent everyone would have to take the same test at the same time with an unbiased supervisor. This would cost the state a large amount of money and it would still be nearly impossible to prevent cheating. The vast majority of IQ tests are not officially certified by psychologists and scientists, so they are also extremely unreliable. For instance, the neuroscientist Dean Burnett took four random online multiple choice IQ tests, randomly guessing the answers and achieved between 120 and 140 in all of them. Some tests even gave him extra points for speed – giving extra credit for getting answers wrong, but quickly. If literacy tests were taken, they would likewise require similar conditions to prevent cheating. Moreover, a Civics exam would not prove any understanding of the issues, only a basic knowledge of the law and government. If IQ tests or literacy tests were taken online, the answers could also be stored and used to create personalised political advertisements through psychographic profiling and manipulate voters into leaning a certain way. In extreme cases this could even cause radicalisation with people falling down extremist rabbit holes online.

One of the most compelling advantages of a democratic government over an authoritarian government is legitimacy. If you were to deny certain groups of people the right to vote, then the government would lose its legitimacy as a government for all people and could be attacked as elitist. Denying certain people the vote could lead to nationwide anger and potentially revolt. Universal suffrage is so ingrained in our psyche as the default political system, that to give the more knowledgeable power over the ignorant would always feel unjust.

In conclusion, although the introduction of a competence or literacy test as a pre-condition for voting sounds superficially appealing, in my view the challenges of setting and administering it and the very clear possibility of abuse, enabling unscrupulous politicians to disenfranchise large sections of the population, are insurmountable. History has shown that such tests are more likely to be used in discriminatory ways. The disenfranchisement of black people in 20th century America acts as a warning as to what could happen if tests were implemented in the future. I do not believe the benefits of a potential epistocracy outweigh the consequences that could follow, threatening the very basis of our democracy.

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How far can it be said that the perfect fifth is the most crucial interval in classical music?

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The perfect fifth is an iconic interval used by many famous composers, one with which we all are familiar, classical musicians or not. Fifths are intervals with a five-tone difference, and famously *Twinkle, twinkle, little star* begins with a perfect fifth. However, I would argue that, even though the perfect fifth is important for the creation of strong harmony, the most culturally influential pieces have been built from different intervals with the same, if not more, harmonic impact. Fifths are also used for underlying chords in the bass line; and although they add to the harmony, I would argue that the first and third degrees of the scale set a firm foundation for the fifth to then build upon. Finally, I would dispute that, in terms of a piece's ending, the fifth chord is vital for a satisfactory harmonic conclusion. Instead, the first degree of the scale is indispensable when finishing a composition, as it returns the piece to the home key, creating a sense of resolution. Intervals such as major thirds and perfect fourths are also much more effective and influential, especially in classical music.

A perfect example of the effective use of intervals other than the perfect fifth is Mozart's *Eine Kleine Nachtmusik*. This serenade, written in 1787, is recognised widely, regardless of any particular affection for classical music, and is one of Mozart's most famous works almost 250 years on. Its foundation is based upon fourths and thirds, with the opening interval a perfect fourth. Despite the absence of a perfect fifth in the opening bars, *Eine Kleine Nachtmusik* has become not just one of the most renowned, but frequently played, pieces of classical music, with over 5.2 million streams on Spotify. In 1984 it also featured prominently in the Academy Award winning biopic *Amadeus*.

Another ground breaking piece of classical music, the influence of which has not been dependent on perfect fifths, is *O Mio Babbino Caro* from Puccini's *Gianni Schicchi*, premiered in 1918. One million copies of the recording were sold in 1969 and it appeared in an advertisement for *Grand Theft Auto* in 2001. Its legendary melody consists of octave intervals, major thirds and scalar runs which create a melodically strong, structured tune, even in the absence of the perfect fifth. Thus, although the perfect fifth is important when creating secure melodies, it is not essential to create successful music. The use of the perfect fifth in *O Mio Babbino Caro* is not necessary, as the aria supplies a breath of fresh air after a period of tension in the opera. Perfect fifths would have been too triumphant for this moment of peace and quiet. Therefore, context defines whether perfect fifths are needed.

An extremely common feature of classical music is the use of the dominant chord, chord V, in the bass line to lay firm harmonic foundations and create a sense of resolution when forming perfect cadences. The dominant chord is built with the fifth degree of a scale as the root of the chord, with the seventh degree followed by the ninth stacked on top of the root. Almost all pieces of classical music contain a perfect cadence, from Bach's *Air on the G String* to his *Ave Maria*, to name but a few. However, although the use of the dominant is important, the tonic chord, the chord built on the first degree of the scale, is the most crucial chord. It successfully creates a resolution which not only works harmonically but also structurally, returning to the home key. If a piece were to end on the dominant chord, using the fifth, the piece would sound incomplete, anticipating a conclusion. Open fifths also tend to be used in classical music: dominant chords with no use of the third degree of the scale. I would argue the use of open fifths does not strengthen the harmony but weakens it. Without the use of the third, the harmony sounds incomplete and does not allow for the possibility of expanding the harmony with thirds. In terms of the bass line, fifths are key, but not the most crucial aspect needed to create a recognisable, successful melody.

One interval that I think is much more effective than the fifth is the remarkably simple whole tone step. Used throughout the classical period, the whole tone step sounds harmonically correct, as a sense of evenness and control is created from a scale. A prime example of scalar runs is in *The Flower Duet*, from Léo Delibes' *Lakmé*, premiered in 1883. This famous duet only contains tone intervals within the first four bars, and these are later repeated. This shows the power that intervals as simple as the one step can have when forming a memorable melody. Even without the perfect fifth, the duet has still had a profound influence on society. It was used in

British Airways advertisements in the 1980s and more recently appeared in *Meet the Parents*, *The Simpsons* and *True Romance*. It has had just under 19 million streams, and that is for one recording by only one singer. The absence of the perfect fifth is not missed, as the use of tone intervals just as effectively creates a tuneful melody. *The Flower Duet* has introduced the beauty of classical music to thousands, and it would not have been able to do that without its gorgeous, scalic melody.

Despite the effective use of other intervals, we cannot ignore the extreme impact the perfect fifth has had on classical music as we know it. Pieces such as *Swan Lake* and Vivaldi's *Spring* from *The Four Seasons* are prime examples, with fifths as their foundation. Tchaikovsky's *Swan Lake* is the most celebrated ballet of all time, and with a strong, triumphant melody backed up by a full orchestra, there is no doubt about why it has been successful. With appearances in twelve television shows, nine video games and four musicals, its impact on society is clear to anyone, even those with no classical music experience. Moreover, Vivaldi's representation of spring using perfect fifths is a classic example of musical evocation, as the fifths used create a sound which is not only triumphant but gives the impression of spring's fresh beginnings. The piece's impact on society has been vast. At 43 minutes long it has been performed in front of many and is constantly on our screens. It has appeared in soundtracks such as *Spider-Man: No Way Home*, *The Fantastic Four* and *The Simpsons*. As we can see, most people find themselves listening to classical music without realising it. Without Vivaldi's excellent use of perfect fifths, this renowned piece would have had nowhere near as much impact as it has done today.

In contrast, another piece which shows off the capabilities of musical expression without the use of fifths is Dvořák's *Symphony No.9*, also known as the *New World Symphony*. It is a true representation of effective melody making. With Dvořák's expressive use of thirds, one of the most iconic tunes was created, making it one of the most popular symphonies of all time. Although the use of the cor anglais aids the effectiveness of the melody, I would say that the use of thirds is what truly solidifies the melody and its structure. As a consequence, the *New World Symphony* has had a profound impact. Neil Armstrong took a tape recording of the symphony with him on the Apollo 11 mission to the moon in 1969. Despite the melody's simplicity, the piece managed to reach the moon within 100 years of its premiere. In addition, many well respected orchestras have interpreted the piece, including the London Philharmonic Orchestra and the London Symphony Orchestra. The *New World Symphony* has become part of society's constant soundtrack. It has featured in the *Star Wars* franchise and *Hovis* advertisements, and its influence is significant 130 years after its release. The huge success of this symphony reveals the impact all music can have, but especially these unique pieces which do not feature perfect fifths.

Despite the efforts of many composers, the perfect fifth has yet to be shown to be the most vital interval used in classical music. This has been shown by the breadth of success achieved by pieces which do not need to rely on perfect fifths. Instead, successful music really depends on intervals such as thirds and perfect fourths to lay down strong foundations for a memorable melody; and iconic pieces without perfect fifths have had a noteworthy influence on today's society, centuries on from their composition. However, the perfect fifth can be an amazingly effective interval when used correctly. For example, Beethoven's *Fifth Symphony* is globally known for its use of fifths. In spite of this, the importance of all other intervals in classical music cannot be overpowered by the perfect fifth. Whole tone and third intervals dominate the classical music world. If these intervals were not as vital as the fifth, we would simply not see them appear, let alone remain influential. Classical musicians and composers have proven the validity of other intervals over time with their incredible use of expression and craftsmanship of composition. The perfect fifth is a particularly important interval, but it is certainly not the most crucial interval in classical music.

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How far can it be said that genetic engineering is more beneficial than harmful?

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Genetic engineering is a way of editing and manipulating genes found in DNA. It can be used for several purposes, from preventing inherited diseases to changing small traits like eye colour. The technology enabling this is still undergoing thorough research and is called CRISPR. It allows scientists to change parts of the DNA sequence by cutting sections, and programming and inputting a template DNA. This means the DNA mends with the changes programmed by the scientist. It could be a lifesaving technology and create a near disease-free future. However, it could also be incredibly dangerous, if something goes wrong in the process or if the technology is used for malign purposes.

Genetic engineering could, for instance, help increase animal production, feeding more of the world's population. The food industry could also be made more efficient, allowing food to be supplied more quickly. For example, a genetically engineered cow called Cosmo was modified 'to produce 75% male offspring': a significant advance for the beef industry 'because testosterone means more muscle, so more meat'¹¹⁶. Scientists added an SRY gene from the Y chromosome, a trigger for the male pathway, into Cosmo's 17th chromosome. As such, if Cosmo's offspring have XX chromosomes, but have inherited the 17th chromosome, the male pathway will be triggered. This is a major scientific development, given the usual 50%, not 75%, chance of being male. Indeed, if this procedure is applied worldwide it could increase farming outputs, saving money and space.

Genetic engineering could also improve the nutritional value of foods, allowing humans to get a balanced diet far more easily than currently possible in many areas of the world. It could also enable nutrients and substances with proven health benefits to be incorporated into foods. Malnutrition is a severe problem in many countries and gene engineering could 'help to increase production of the most valuable components of specific crops'. Rice, a staple in many countries, lacks certain nutrients and protein. Yet gene engineering could make rice into a balanced meal, providing everyone all over the world with their essential nutrients. Protein could be added to rice to change the amino acid composition to 'increase the nutritional value of ... (this) ... staple crop'¹¹⁷.

Genetic engineering could also improve crop production, making crops resistant to disease, drought and other threats. Crops could be genetically modified to include traits necessary for survival in particular regions, for instance reducing the need for water or increasing resistance to certain pests. This would allow more species to survive, encouraging species biodiversity. It would also enable food to grow in previously impossible areas, easing issues of food supply and potentially providing a solution to world hunger.

However, although genetic engineering might increase species diversity, it would at the same time harmfully reduce genetic diversity: the many different genes existing in individuals in a population. If populations have a high genetic diversity it means the species is more likely to survive and adapt to environmental change. Having a high genetic diversity helps to 'maintain the health and vigour of a population to resist infectious diseases, pests and other stresses'¹¹⁸. Yet, if we genetically engineer species to show a particular favourable trait, not only will this disrupt natural selection, it will also lower genetic diversity. This means a 'new and unknown virus or a disease may affect a much larger population'¹¹⁹. For example, if a new pathogen began to spread around a species

¹¹⁶ 'Meet Cosmo, the gene-edited Crispr calf' *Virtual Institute*, available at <https://www.geneconvenevi.org/articles/meet-cosmo-the-gene-edited-crispr->; & 'Does beef only come from male cows?' *Eating Wiki* (28/4/2022), available at <https://eatingwiki.com/does-beef-only-come-male-cows/#:~:text=No%2C%20beef%20can%20come%20from%20both%20male%20or,bulls%2C%20and%20we%20don%E2%80%99t%20commonly%20eat%20bull%20meat.>

¹¹⁷ G. Junne, *Biotechnology: the impact on food and nutrition in developing countries*, available at <https://www.fao.org/3/u3550t/u3550t0h.htm>.

¹¹⁸ 'Why Is Genetic Diversity Important for Survival?' *Greentumble* (7/6/2021), available at <https://greentumble.com/why-is-genetic-diversity-important-for-survival>.

¹¹⁹ 'The Possibilities and Pitfalls of Genetic Engineering in Humans' *BiologyWise*, available at <https://biologywise.com/genetic-engineering-in-humans>.

genetically modified for enhanced photosynthesis, that species would have an increased number of similar genes, so their genetic diversity would be lower. The species would thus be more likely to be affected by the pathogen than if not genetically modified.

Another potentially harmful side effect is that through genetic engineering some chromosomes might be deleted or changed accidentally, with unintended effects. As the National Cancer Institute notes 'genetic changes can lead to cancer if they alter the way your cells grow and spread' and 'most cancer-causing DNA changes occur in genes'¹²⁰. The process of gene editing 'could cause hundreds or thousands of unwanted mutations'. In fact, a recent study using CRISPR on mice revealed over a thousand unexpected mutations and 'over 100 large deletions and insertions'¹²¹. This evidence suggests genetic engineering is simply too dangerous, especially as cancer already contributes to 24% of deaths in the UK¹²². Gene engineering shouldn't be a risk worth taking, especially if the reason for using the technology is purely for aesthetics. We should be developing a technology to fight cancer not potentially adding a further cause.

However, even though genetic engineering could currently cause cancer, extensive research and experimentation will be done before it is deployed for human use, hopefully eliminating risk. In fact, gene engineering has the potential to cure all genetic diseases, cancer included. Currently, it is being used to help patients fight cancer by genetically altering patients' cells. Gene therapy could also be the solution to many genetic disorders, introducing normal genes into cells with faulty genes. It could be the 'new approach to the treatment of vision loss, cancer, and other serious and rare diseases'. This benefit would surely outweigh all other harmful side effects¹²³.

Genetic engineering is an immensely powerful tool which, when used to prevent genetic disorders, presents a significant scientific breakthrough. But, if abused, it could completely disrupt the world as we know it. It could make certain people almost superhuman and embed social injustice as part of our DNA. It will allow people to change their traits and characteristics, and people with socially undesirable genes might experience heightened discrimination. It could cause social injustice between those with and without genetic modification, and only the wealthy could afford it, making them genetically superior to others. They could have their own designer babies, and design them with so-called perfect traits and characteristics. Money alone would no longer divide the rich and poor but personality traits, looks and more. The world is already struggling to prevent injustice, and genetic engineering could exacerbate the problem. There must also have been a reason why the man who created the 'world's first gene-edited babies, was sentenced to three years in prison'¹²⁴. The true reason is that the world isn't prepared for this kind of technology, and it is simply too harmful to be used.

In my opinion, I think we will only reap the true reward of genetic engineering when it has gone through the vigorous testing and research necessary to make sure it is safe, and researchers have eliminated the risk of it causing cancer. Even then, it will only be more beneficial than harmful if it is used for the right purposes, for instance curing diseases and increasing food production. If a technology has the potential to save so many lives it should be harnessed, but only if it isn't abused and doesn't increase social inequality. It is hard to say in the future how we will solve this dilemma and maintain its ethical use. A potential solution could be to monitor its use to ensure that it is more beneficial than harmful and to ensure it is only used for scientific reasons not aesthetic ones.

¹²⁰ 'The Genetics Of Cancer' *National Cancer Institute* (17/8/2022).

¹²¹ 'CRISPR Gene-Editing Might Cause Thousands of Unintended Mutations' *Popularmechanics*, available at <https://www.popularmechanics.com/science/health/a26693/crispr-causes-thousands-of-mutations/>.

¹²² 'Cancer mortality Statistics' *Cancer Research*, available at <https://www.cancerresearchuk.org/health-professional/cancer-statistics/mortality>.

¹²³ 'How Gene Therapy Can Cure or Treat Diseases' *FDA* (28/7/2022), available at <https://www.fda.gov/consumers/consumer-updates/how-gene-therapy-can-cure-or-treat-diseases>.

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The modern world has forgotten over 400 years of black oppression.

Ayomide Sotande-Peters



Ayomide is studying English Literature, French and Latin at A Level. She would like to study Law with French Law at university, and she is passionate about the role jurisprudence plays in modern society.

Black Lives Matter ...
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I start by honouring the more than 120 black lives lost during the Black Lives Matter movement, amidst the global pandemic. I repeat 11 times ... 11 times ... George Floyd told his killers 'I can't breathe'. To be young and black in the 21st century is to be socially and psychologically aware of my place in the world. It would be false to say the black community continually thinks about its disadvantaged position, because we have many success stories, from Barack Obama to Chadwick Boseman. However, George Floyd's untimely death was a wakeup call for me and the worldwide community of racial minorities.

At the height of the world's response to his death, I found myself questioning my choice of friends and my own attitudes to my race and culture. I had an overbearing impression that everyone was seeking to catch me out solely because of my race. I was in a constant state of paranoia. Yet, the experience was grounding and humbling, allowing me to re-evaluate and come to terms both with the reality of my people and society's fundamental building blocks. There was a shift in my perception.

Is it time to move on or confront the agony of our people's history? Or, is the root cause of our problems an unwillingness to detach ourselves from our deleterious history?

I was unsurprised to discover how the dehumanisation of Africans has instilled in the white population a sense of superiority. Freud's idea of 'the uncanny' (*unheimlich*) reveals underlying western imperial predispositions: the uneasy feeling Siddiqi has discerned in former colonial empires regarding their oversea territories. This archaic concept still informs attitudes towards the black population. We are '*unheimlich*' to white people, human but not quite the same, with our distinct skin. With this comes a sense of unease, so easily felt that black people themselves tend to forget the long accompanying history of racial injustice. It is a shame that the past still uncannily haunts us today.

Racism. People aren't born with racism; they are taught it. White people should not now be entirely blamed for traditions ingrained in their cultures, enforcing subconscious conceptions which affect their interactions with the exterior world. However, I came to resent the white population. Most black children, including me, are brought up with the impulse that they should always prove themselves in a society solely constructed for the benefit of white people. 'White privilege' can be likened to a river race, with the white population swimming with the current, and the black population against. Even nature works against us, forcing us to move in the wrong direction. As a young black girl, this realisation forced me to sink into depths of despair. Indeed, in an American study from the 1940s, two dolls (black and white) were put in front of children and, when asked to choose the ugly doll, the children chose the black doll on countless occasions. This shows how early standards of beauty become ingrained, with the primary message being beauty is unobtainable if one is black.

Pondering my past, I found scatterings of 'microaggressions', both ignorantly unintended and fully intentional. I felt bombarded by suppressed emotions, to which I had chosen to turn a blind eye, and I am still overwhelmed by anger and hurt. With new understanding and influenced by social media, I started to re-evaluate my hair, physical appearance, my accent, absolutely everything, because I had started to dismiss the value of my heritage and the little things that ruled me apart from any crowd. In fact, my resentment is now directed more at myself; and, amidst all this internalised turmoil, I was given immeasurable love by my friends (especially my white friends). In truth, their appreciation of my authenticity saved me from this destructive vicious cycle of thought. I still think they like my curly hair more than I do! As I look back on this time of unrest in my life, I am ashamed so many people protested to celebrate these features, of which I had become weary. Self-confidence in the black community is the product of incessant hard work, given our history of being shunned for our physical appearance.

Slavery. What first comes to mind? Perhaps the transatlantic route (used for over 400 years) with its inhumane trafficking of the negro, or its modern-day implications for the black population and wider society. Although many years have passed, slavery still seems to loom over everyone socially, economically and mentally.

The transatlantic slave trade continued from America's origins in the 15th century to 1808, from ports like Badagry in Nigeria (my country of origin). Slavery in America then came to an end on the 19th June 1865. This is celebrated as 'Juneteenth', to commemorate our progress to freedom after years of unaccountable oppression. My ancestors only narrowly escaped this fate, and because of their bravery my identity hasn't been stripped away. This should have been a time for everyone in America to begin to live justly. However, the majority of the white population was still not convinced of the worth and potential of the black population. So, even though black people were legally free from slavery, they were, and still remain, judged by white people's biased prejudices. A major example was the 'crack epidemic' of the early 1980s, when 80% of drug abuse was in the black community. This saw a significant rise in the incarceration of non-violent black users, impacting the population of prisons across the USA. This then destructively influenced society's perception of the average black person, automatically pegging them with illicit forms of behaviour, as seen with victims like George Floyd and Breonna Taylor. Understanding this made me feel overwhelming guilt. So many black people around the world face existential crises because they remain unaware of their true heritage and place of origin, because their ancestors were snatched away to be exploited. Many even assume the reality is completely detached from our shocking history.

Perhaps the world hasn't forgotten about black oppression and is truly seeking to emphasize black lives and their daily struggle. For instance, during the Black Lives Matter movement of 2020 petitions were circulated, and a plethora of businesses committed to help. As a society we have also seen a new 'hip' emphasis on black history, reflected in celebrations from Black History Month to 'Juneteenth'. However, their sluggish adoption by society suggests a limited attempt to console the black population, to give a surface impression of integration and acceptance. These celebrations also seem shadowed by a more unforgiving reality. It is particularly ironic that when Africans were invaded and inflicted with Judeo-Christian views by colonists, come integration into Europe we are being treated as the lesser..

Racism is also not just an American problem. It is prevalent in the UK, despite desperate attempts to portray a 'liberal and diverse' society welcoming to all, and despite the obscured history of the Royal Family. During the 1800s my home (Nigeria) was invaded by the British and became a British protectorate. Nigeria only obtained her independence in 1960, just over 60 years ago. Yet, there were no celebrations whatsoever for the Nigerian students in school this year to mark the occasion. To think that the white colonists used to cage children and delight in their animalistic presence for entertainment baffles me. The young European children who lived in African countries during that period are now grandparents, and their actions will have left a lasting impact on their children and grandchildren, leaving instinctive racist habits. What do you think they will have taught their children and grandchildren about the black population and how that population deserves to be treated? For David Cameron, the former British Prime Minister, Nigeria is 'fantastically corrupt'; and, statistically, the poverty toll reached 95 million in 2022, with an additional 5 million coming from the pandemic.

Yes, racism is horrible towards any minority. However, the biggest misconception is that racism occurs instantaneously. It does not. It is hereditary. White babies are not born hating black babies because of their skin colour. Instead, white babies (depending on their family background) grow up ignorant of the issue of racism: the teaching of the white population's ultra-superiority automatically means minority groups – including the black population – require an unwarranted validation from the white population to become 'civilised'.

The black population has contributed to so many aspects of modern society; and it is baffling to think it is still so gravely disadvantaged socio-economically. An average black person is paid 20% less than the average white person. Various factors might influence this figure, from educational background to standard of living, but all these factors have their root cause in an issue the world wants so desperately to forget.

The oppression experienced by our community (for a prolonged period) has negatively affected us mentally, pushing us to the brink of despair. A permanent image of the mistreatment of black people around the world has been imprinted on our minds, and it has trapped us into conforming to such normalised forms of exploitation, with most of the white population ignorant of the privilege they possess. We also ponder our relationship with death as we see so many within our community inflicted with it. It is something all black women, men and children learn to accept at a young age, in a society constantly justifying the normalcy of countless acts of injustice.

I often wonder if it is my responsibility to educate others with what should be general knowledge: the challenges black people have gone through to 'fit into' white society. My mother, during her A Level studies in the UK, often had peers inquire whether she lived in a coconut tree, even though my grandfather was an esteemed engineer in the USA and my grandmother a trained nurse. In one instance, my mother had had enough, so she invited a German girl, Charlotte, to her family home in Lagos and to her surprise, my mother's home was a 'mansion'. Faced by such adversity, my mother was forced to endure and prove herself, seeking to find solace from all the ignorant comments to which she was subjected.

I am aware that I will never be the same but rather 'the other': a truth I have been forced to accommodate. However, this means the white population should also face their past with its detrimental repercussions. It shouldn't be required for us to educate them on these matters. And, just like we are forced to learn about World War I in History lessons, others should learn about the evils of the white past. We must admit our shortcomings by being truthful to ourselves, allowing these truths to mature and spread like wildfire across generations.

It is time for conscious change.

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