

APOCALYPSE NOW? SEVEN VISIONS FROM THE HISTORIC COLLECTIONS

An exhibition held at
Balliol College Historic
Collections Centre,
St Cross Church, Oxford.
Michaelmas Term 2025.

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Exhibition and catalogue by Balliol College Library

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Catalogue design by Joe Graham,
www.balancingact.org.uk/design

Published by Balliol College,
University of Oxford, 2025

Cover and inside cover images:

Cover: Luther Bible. *[Balliol Library]*
Inside cover: Detail from title page and plate showing the Fire of London from Samuel Rolle's [Shilhavtiyah] or, *The Burning of London in the Year 1666*. (Printed by R.I. for Thomas Parkhurst, 1667). *[Balliol Library Arch A 9 9]*

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INTRODUCTION

Dr Farrah Jarral (Balliol 2000)

Apocalyptic visions get under our skin. Apocalypses themselves are a fact of life on earth. Some may arrive in an instant, like the asteroid that obliterated a gentle triceratops breakfasting on ferns in the late Cretaceous period. Others unfold monstrously over minutes or hours, like the recoiling of the sea before a tsunami strikes, or the smoking of Vesuvius before the pyroclastic surge of its eruption cremated the citizens of Pompeii. Large and small apocalypses surround and infiltrate our bodies. Within our very cells a single genetic typo, one letter mistranscribed in the replication of our DNA, can trigger the rampant proliferation of cells leading to cancer. A ruptured aneurysm or blood clot in the brain can in a few moments wrench away the foundations of a pleasurable life built up over decades, robbing us of the ability to speak, read, or engage in intellectual life. Even when all is well within the microcosms of our physical selves, apocalyptic loss is ever-present in our social networks. To love someone—a partner, child, friend, or pet—is to live with the constant risk of total personal apocalypse if something terrible were to befall them.

It is a wonder, then, with the psychic burden of all these flesh and blood macro- and micro-apocalypses, that humanity has such an appetite for fictional ones too. Over the last hundred years, Millenarian cults of various flavours have mesmerised people across the world. Often, the beguiling nature of the apocalyptic visions peddled has been matched by the charisma of the cult leader. The common theme is that an imminent apocalypse will arrive and cleanse the world, ushering in a new era of perfection. Millenarian movements have emerged in many different social contexts, including colonial resistance. In 1857, a young Xhosa girl reported ancestral prophetic visions instructing her people to destroy their cattle and crops, in the anticipation that this would bring peace, prosperity, and freedom from the yoke of British imperialists. Vast numbers of cattle were duly slaughtered, and the resulting catastrophic famine killed some 30,000 people.

Apocalyptic visions captivate us because they offer order and sometimes redemption in an exhausting, unjust world so saturated with the risk of disaster that it is scarcely tolerable. As American anthropologist Ernest Becker put it, “Full humanness means full fear and trembling, at least some of the waking day.” The problem with them is that they are ultimately hypnotic. Accepting apocalyptic narratives is to yield one’s critical faculties and fall into a zombie-like state —drinking the Kool-Aid, as the followers of Jim Jones’s cult did in 1978. Nowhere is this more apparent to me than in relation to climate doomerism, the fatalistic, cultish attitude that can seep in when one is overwhelmed by the enormity of our current largest impending apocalypse. Like a single, inexorable, terrifying horseman bearing down upon us, it is easy to freeze in terror. A fatalistic worldview warps the story into one in which we have no hope. It deadens the spirits. But just as fatuous optimism fosters apathy, uncritical pessimism swallowed whole is paralysing.

While it is true that things are bad, and will get worse, a few truths need to be held close in the face of the rising fear. Firstly, life on our planet has taken many forms and we are probably not the last. While the demise of human culture to make way for, say, the Kingdom of Algae, may not be of much comfort, it is a refreshing antidote to the poison of human hubris. Secondly, we are nothing if not adventurous as a species and we owe it to ourselves to rouse ourselves from the sedation of apocalypse-talk and have a go at doing what we can to act on climate change and re-sequester the excess carbon dioxide we have released into the atmosphere.

As well as rejecting hopeless and hypnotic stories, we would do well to heed cultural critic Rebecca Solnit, who urges us to take a long view of history and try “seeing the world as a tortoise, not a mayfly.” As institutions go, Balliol is about as tortoise as it gets. It might be time to invoke yet longer-lived creatures to inspire us to consider our place in the world and how to act. Be more Greenland shark, perhaps. Be more yew tree. Be more ancient mycelial network.

In her book on apocalypse across time and place, writer Lizzie Wade observes that such events set “society on a new path, often one that was unimaginable during the Before.” The apocalypse of climate change has one foot inside our front door already, but it need not be world-ending. Instead, going back to the word’s Greek roots, perhaps it could be an unveiling of the truth about our way of life and its impact on our one, precious, wild planet, a blue-green orb of apparently stupendous rarity, spinning in the black. Perhaps it could be an invitation to be heroic, to rediscover our place in the mutual web of all creatures and things, in which we are no longer extractive, arrogant, and hierarchical; in which we consume less, and care more. Perhaps this apocalypse could be more of a revelation.

APOCALYPSE NOW?

Disaster is always a draw. Throughout history the titillation of impending doom has made for good headlines and bolstered the proclamations of the righteous. Although people have survived countless crises, from pandemics and wars to natural disasters and economic collapse, the drama of disruption has usually won out against more mundane narratives of humanity's ability to recover, innovate, and endure. Where's the profit in peace? We want apocalypse now! Until it seems to get a little too close for comfort. Hopefully, in this exhibition we can find some reasons to be cheerful.

VISION 1: REVELATION

The foundational text of the apocalypse in the Christian tradition is *Revelation*. The final book of the Christian Bible, it features divine judgment, cosmic battles, the fall of corrupt empires, plagues, fire, famine, and the eventual triumph of good through Christ's return. Its symbols—four horsemen, seven seals, beasts, and dragons—have endured as metaphors for political chaos, ecological crisis, and existential dread. Despite its terrifying imagery, *Revelation* functions less as literal prophecy and more as a moral and political allegory. It was written under Roman imperial oppression and reflects early Christian hopes that corrupt powers would be overthrown – something that feels cyclical: every generation projects its own crises into *Revelation's* frame, whether these are plagues, world wars, or environmental collapse.

The Bible featured here has a 19th-century blue velvet binding with a brass plaque bearing Balliol's arms, but the pages inside date to the 16th century. It is a deluxe model of this printing with hand-coloured illustrations (at their best in *Revelation*) and gilding to make it look like a manuscript. It may have been produced for the sponsor of the edition, Johann Friedrich I, Elector of Saxony, a supporter of Luther.

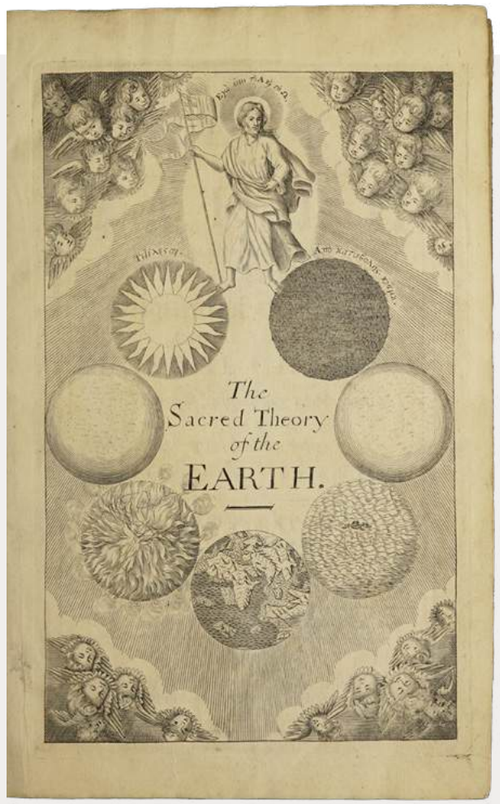


Luther Bible. *[Balliol Library]*

VISION 2: WATER

Ancient Inundations

The story of Noah's Ark, found in the *Book of Genesis*, seems a relic of a fascination with global catastrophe that is milennia old. Perhaps composed in the 5th century BCE, its portrayal of a corrupt and violent world cleansed by God's wrath in the form of a great flood, and repopulated by a righteous man, forewarned in time to build his family a boat, has parallels in the Mesopotamian epic of Gilgamesh (dating to at least a thousand years earlier), as well as the Satapatha Brahmana from India, and the myth of Deucalion and Pyrrha in Greek mythology.



Thomas Burnet's *The Sacred Theory of the Earth.* Walter Kettilby, 1684 *[Balliol Library 580 e 8 (2)]*

At its core lies a story of destruction and renewal—an apocalypse driven by moral failure, reacted to by divine intervention, but ending with hope. It also shows the familiar human tendency to imagine the end of the world as a response to crisis, and this is not unique to *Genesis*. Apocalyptic narratives echo across cultures and ages, often surfacing during times of societal stress. These are a mirror of our collective anxiety and need to make meaning from chaos. But not all ancient inundations conform to such a narrative arc – the Egyptians viewed floods as quite the opposite – for them floods brought life.

In this book, Thomas Burnet (1635?-1715) an English theologian tells the story of the beginning of Earth, and how he thinks the Great Flood actually happened. The frontispiece to Burnet's book perfectly captures his narrative of the history of Earth. Jesus stands above seven discs: the first is a dark circle filled with jumbled marks depicting the Earth in chaos. Then there's a light disc, the first Earth, and then Earth during the flood with Noah's ark, accompanied by angels. The fourth shows the continents formed and the fifth is the Earth on fire. The sixth reveals the newly restored Earth. The last is a sun, as Burnet believes that "after the last day of Judgment, [the Earth] will be changed into the nature of a Sun, or of a fixt Star".

Today, climate change has become the dominant catastrophic fear. Rising seas, burning forests and mass extinctions, are all measurable and scientifically grounded threats. But again, the narrative often takes on a mythic, apocalyptic tone leading to Ark-like solutions in the shape of technology and migration, and a hope for rebirth – quite possibly on a different planet. The climate crisis however is not divinely instituted but human-made, and we have the dual role of cause and agent of salvation. One lesson from the story of the Ark is that disaster isn't inevitable, but that foresight, preparation and moral clarity matter: Noah acted before the rain. Climate change is not only a threat of apocalyptic proportions, it is a test of foresight and collective action to meet a challenge unfolding slowly without a clear tipping point. We repeatedly anticipate end-times, yet the world has not ended yet - the storm passes and we rebuild.

Perhaps the language of apocalypse obscures the nuances and dramatises too much, preventing action? After all, apocalypse stories remind us that the end seems to be recurrent.

Sea of Ice

Glaciers feature in opposing apocalyptic scenarios, those of both a warming and a freezing world. They could literally engulf the world in ice, or they could melt away completely, revealing long kept viruses, raising sea levels, and disrupting water supplies. Or, as is already happening, they could fracture and avalanche into valleys, as at Blatten in Switzerland on 28 May 2025, when a chunk of Kleines Nesthorn's peak crumbled and hung over the village, held back only by the glacier.



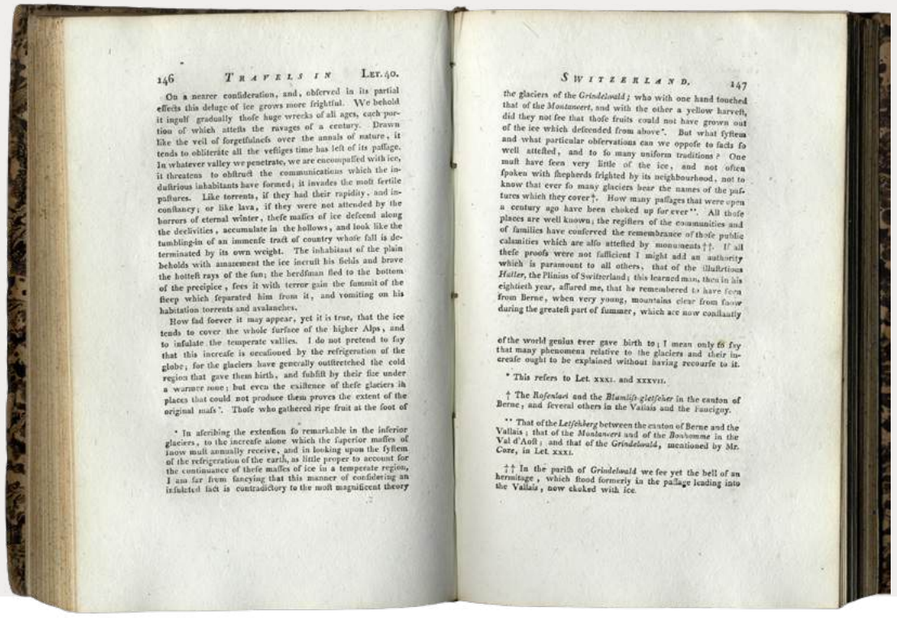
The Chain of Mont Blanc map, based on surveys by Mieulet, Dufour, and Adams Reilly, from *Scrambles Amongst the Alps in the Years 1860-69* by Edward Whymper, London, 1871. *[Balliol Library. Mountaineering Collection]*

This eventually gave way, leaving the whole mass to tumble below, obliterating a community that had been there for more than 800 years.

“Blatten has been wiped away. Erased, obliterated, destroyed, stamped into the ground,” the village’s mayor Matthias Bellwald said, “The memories preserved in countless books, photo albums, documentation – everything is gone. In short, this is ground zero for Blatten.”

One of the most important works of the Enlightenment captured imaginations and the feeling of dread brought on by encroaching cold. Georges-Louis Leclerc, le comte de Buffon, theorised that Earth was created in a violent collision between a comet and the sun, and had since been cooling down, until it would finally become a planet of ice once again. The Little Ice Age of the 17th century had seen glaciers advance down valleys and overwhelm villages. At least six villages in the Chamonix valley were lost under growing glaciers, while others were abandoned to floods or avalanches, or because the inhabitants were simply spooked. To Buffon this all pointed towards an impending big freeze and his advice was to burn wood and coal to delay its onset.

Anthony Adams-Reilly was born in Ireland in 1836. His interest in the Alps was sparked by James Forbes’s *Travels through the Alps of Savoy* of 1842, and developed into an enthusiasm for mountaineering. Forbes’ work contained a map of the Mer de Glace (Sea of Ice), one of the first accurate charts of a glacier. Although new editions were published until 1853, Forbes’s health prevented his extending his discoveries in that field. Reilly took up the baton showing a special interest in the Mont Blanc Massif. He was a very capable artist and made panoramic drawings of different parts of the range.



146 TRAVELS IN LET. 40.

On a nearer conſideration, and, obſerved in its partial effects this deluge of ice grows more frightful. We behold it ingulf gradually thoſe huge wrecks of all ages, each portion of which atteſts the ravages of a century. Drawn like the veil of forgetfulneſs over the annals of nature, it tends to obliterate all the veſtiges time has left of its paſſage. In whatever valley we penetrate, we are encompaſſed with ice, it threatens to obſtruct the communications which the induſtrious inhabitants have formed; it invades the moſt fertile paſtures. Like torrents, if they had their rapidity, and inconſtancy; or like lava, if they were not attended by the horrors of eternal winter, theſe maſſes of ice deſcend along the declivities, accumulate in the hollows, and look like the tumbling-in of an immenſe tract of country whoſe fall is determinated by its own weight. The inhabitant of the plain beholds with amazement the ice incruſt his fields and brave the hotteſt rays of the ſun; the herdſman fled to the bottom of the precipice, ſees it with terror gain the ſummit of the ſteep which ſeparated him from it, and vomiting on his habitation torrents and avalanches.

How ſad ſoever it may appear, yet it is true, that the ice tends to cover the whole ſurface of the higher Alps, and to inſulate the temperate vallies. I do not pretend to ſay that this increaſe is occaſioned by the refrigeration of the globe; for the glaciers have generally outſtretched the cold region that gave them birth, and ſubſiſt by their ſize under a warmer zone; but even the exiſtence of theſe glaciers in places that could not produce them proves the extent of the original maſs*. Thoſe who gathered ripe fruit at the foot of

* In aſcribing the extenſion ſo remarkable in the inferior glaciers, to the increaſe alone which the ſuperior maſſes of ſnow muſt annually receive, and in looking upon the ſyſtem of the refrigeration of the earth, as little proper to account for the continuance of theſe maſſes of ice in a temperate region, I am far from fancying that this manner of conſidering an inſulated fact is contradictory to the moſt magnificent theory

SWITZERLAND. 147

the glaciers of the *Grindelwald*; who with one hand touched that of the *Montanvert*, and with the other a yellow harveſt, did they not ſee that thoſe fruits could not have grown out of the ice which deſcended from above*. But what ſyſtem and what particular obſervations can we oppoſe to facts ſo well atteſted, and to ſo many uniform traditions? One muſt have ſeen very little of the ice, and not often ſpoken with ſhepherds frighted by its neighbourhood, not to know that ever ſo many glaciers bear the names of the paſtures which they cover†. How many paſſages that were open a century ago have been choked up for ever††. All theſe places are well known; the regiſters of the communities and of families have conſerved the remembrance of thoſe public calamities which are alſo atteſted by monuments‡‡. If all theſe proofs were not ſufficient I might add an authority which is paramount to all others, that of the illuſtrious *Haller*, the Pliny of Switzerland; this learned man, then in his eighteenth year, aſſured me, that he remembered to have ſeen from Berne, when very young, mountains clear from ſnow during the greateſt part of ſummer, which are now conſtantly

of the world genius ever gave birth to; I mean only to ſay that many phenomena relative to the glaciers and their increaſe ought to be explained without having recourſe to it.

* This refers to Let. XXXI. and XXXVII.

† The *Roſenlaui* and the *Blumlis-gletſcher* in the canton of Berne; and ſeveral others in the Valais and the Faucigny.

** That of the *Letſchberg* between the canton of Berne and the Valais; that of the *Montanvert* and of the *Boiſſonne* in the Val d'Aoſt; and that of the *Grindelwald*, mentioned by Mr. Coxe, in Let. XXXI.

†† In the parish of *Grindelwald* we ſee yet the hell of an hermitage, which ſtood formerly in the paſſage leading into the Valais, now choked with ice.

William Coxe’s *Travels in Switzerland* and in the country of the Grisons, Paris, 1802, Vol. 2. *[Balliol Library. Morier Collection 10/2]*



Francis Towne’s Mer de Glace drawing.
[Loaned by Adam Roberts (Emeritus Fellow)]

Forbes encouraged Reilly to think seriously about the construction of an accurate map, and the result is displayed on the previous page: the first scientific map of the highest mountain chain in Europe.

William Coxe, historian and clergyman, describes the contemporary physical geography of Switzerland in these letters, written between 1776 and 1779, to the author and translator William Melmoth. Coxe writes that:

“the ice tends to cover the whole surface of the higher Alps, and to insulate, the temperate vallies. I do not pretend to say that this increase is occasioned by the refrigeration of the globe; for the glaciers have generally outstretched the cold region that gave them birth, and subsist by their size under a warmer zone […] Those who gathered ripe fruit at the foot of the glaciers of the Grindelwald; who with one hand touched that of the Montanvert, and with the other a yellow harvest, did they not see that those fruits could not have grown out of the ice which descended from above […] One must have seen very little of the ice, and not often spoken with shepherds frighted by its neighbourhood, not to know that ever so many glaciers bear the names of the pastures which they cover. How many passages that were open a century ago have been choked up for ever.”

During the Little Ice Age the Mer de Glace at Mont Blanc reached the plain in the Chamonix Valley, with maximal extensions in 1644 and 1821 AD, and two hamlets – Bonanay and Le Châtelard – were largely destroyed by the advancing glacier before 1625.[i] A cadastral survey, conducted between 1728 and 1738, led to the first maps of the Chamonix Valley, revealing that, while the glacier was still near its furthest extent, it was no longer a threat to villages.[ii] Nevertheless, the glacier’s tongue remained in the

valley bottom, forming an impressive terminus with a vaulted cavern. From the 1850s it began an inexorable retreat until the current time, the pace of which has escalated dramatically since 1995.

Artist, Francis Towne received little attention in his lifetime, remaining quite obscure until the twentieth century. His travels to Italy and through the Alps in 1780 resulted in the production of a large amount of work. Compare his drawing featured here, showing the scale of the Mer de Glace at this time, filling the valley with waves of ice, with the reduced glacier in the Chalet Book from 1953, and the even smaller glacier that we see today. Adams-Reilly's map also shows the drastic changes in the area over the last century. Although the glacier's position was stable from the 1880s to 1931, it then retreated by 818 m by the end of the 1960s, only to advance by 143 m between 1969 to 1995. This fluctuation formed a small frontal moraine still visible today. From 1995 until 2015, the glacier retreated by another 728 m.[iii] The result is that it now terminates 2.5 km further uphill than in the 18th century. Perhaps as alarming is the amount of depth it has lost – thinning by 160 m in the 35 years to 2024.[iv]

In 1891 Francis Urquhart (Balliol 1890, and later Fellow) took some fellow students to the summer home built by his parents high in the French Alps for a reading party. The event was popular so he continued these parties to introduce students to European culture from this chalet, where serious reading could take place in a mountain environment, with none of the distractions people would find in Oxford.

Its situation made a useful base for outings to the glacial shelf of Tête Rousse (3,167 m) or for circumnavigations of Mont Blanc itself. Each party documented their stays in the Chalet notebooks, like the one featured here, that included their itineraries and photographs, making the collection a useful resource for charting changes in the mountain environment.

A reason to be cheerful? Climate change is a complex process that throws out differing results, even for glaciers. The Karakoram mountain region, which spans the borders of Pakistan, China, and India has experienced balanced, even slightly growing glaciers since the turn of the century. This "Karakoram Anomaly" seems to be caused by the location and the steepness of the mountains, which experience a summer vortex of cold air.

Photo of the Mer de Glace from Montenvers
[Balliol College Archives, Chalet Book 3].
Reproduced by kind permission of the Chalet Trust.

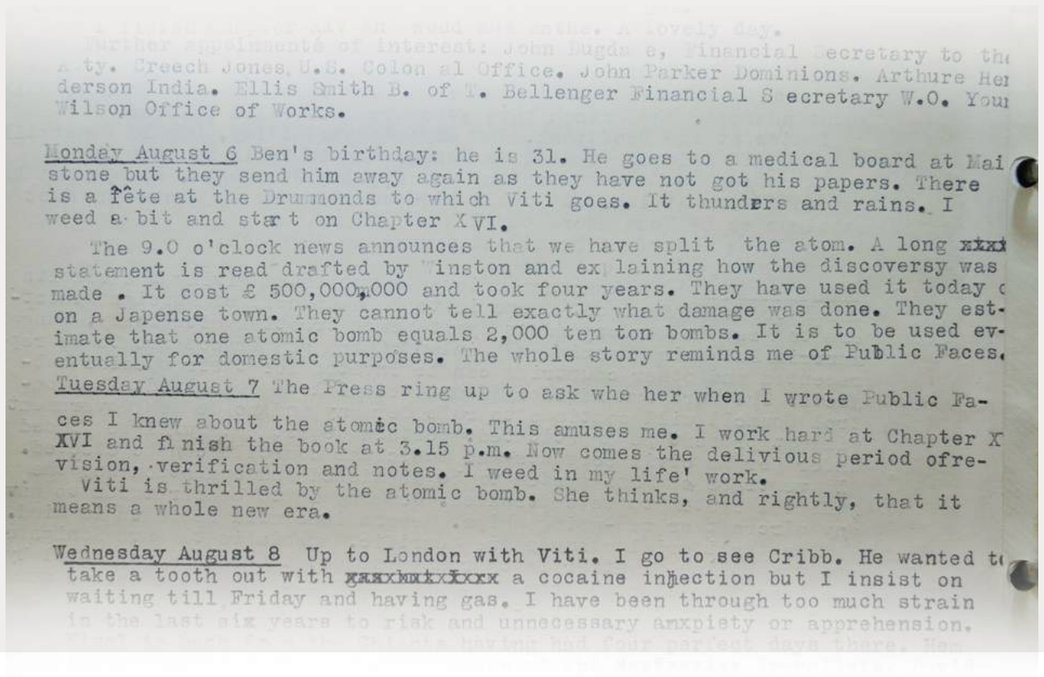
VISION 3: NUCLEAR MADNESS

"6 August 1945: The 9 o'clock news announces that we have split the atom … They have used it today on a Japanese town. They cannot tell exactly what damage was done".

This is how Harold Nicolson (Balliol 1904) records the bombing of Hiroshima in his diary. Retrospectively his words seem to underplay the seriousness of the US military action, signed off by the UK, which killed an estimated 140,000 people[v] in a city with a population of 250,000. Maybe he was distracted by events closer to home, having lost his seat in Parliament in the July general election that year. Or perhaps his words represent the unprecedented nature of the atom bomb, the unimaginable scale of the damage only gradually being understood by someone far away from the blast.

The next day Nicolson's diary records his amusement when the papers phoned him to ask whether he knew about the atomic bomb when writing his 1932 novel, Public Faces. Although this political satire does feature the development of a super bomb in the UK, it is more likely that he borrowed the idea from H.G. Well's 1914 serial *The World Set Free*[vi] than from government secrets. With hindsight the most chilling words on this page

Harold Nicolson's diary entries for 6 & 7 August 1945. [BCHC/PP/NICO/25 folio 44 verso] *Reproduced with permission of Juliet Nicolson.*



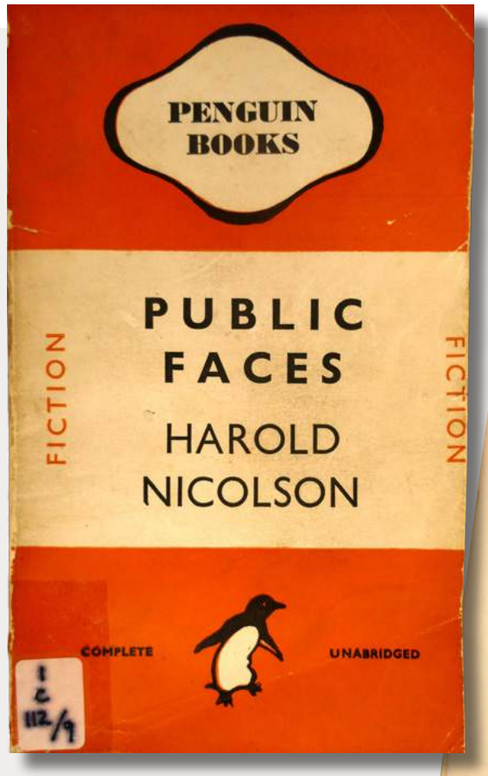
Monday August 6 Ben's birthday: he is 31. He goes to a medical board at Mai stone but they send him away again as they have not got his papers. There is a fête at the Drummonds to which Viti goes. It thunders and rains. I weed a bit and start on Chapter XVI.

The 9.0 o'clock news announces that we have split the atom. A long xxxx statement is read drafted by inston and ex laining how the discoversy was made . It cost £ 500,000,000 and took four years. They have used it today on a Japense town. They cannot tell exactly what damage was done. They estimate that one atomic bomb equals 2,000 ten ton bombs. It is to be used eventually for domestic purposes. The whole story reminds me of Public Faces.

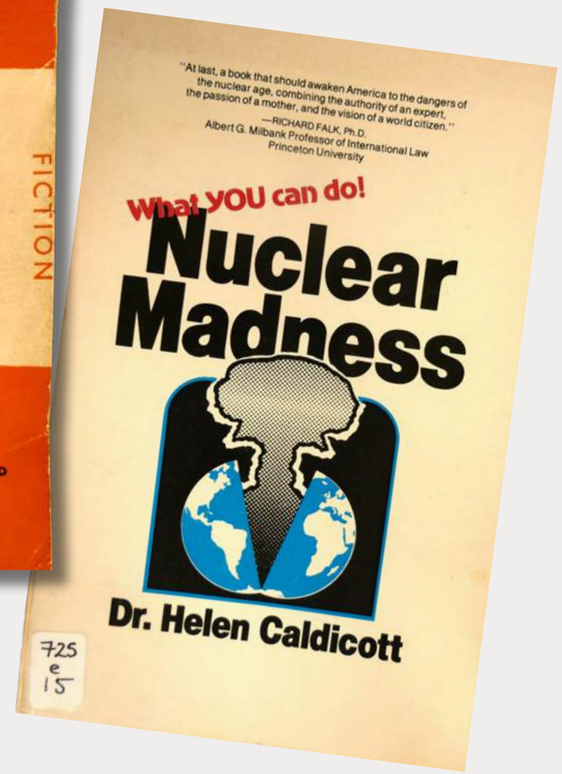
Tuesday August 7 The Press ring up to ask whe her when I wrote Public Faces I knew about the atomic bomb. This amuses me. I work hard at Chapter XVI and finish the book at 3.15 p.m. Now comes the delivious period ofrevision, verification and notes. I weed in my life' work.

Viti is thrilled by the atomic bomb. She thinks, and rightly, that it means a whole new era.

Wednesday August 8 Up to London with Viti. I go to see Cribb. He wanted t take a tooth out with xxxxxxxxxx a cocaine injection but I insist on waiting till Friday and having gas. I have been through too much strain



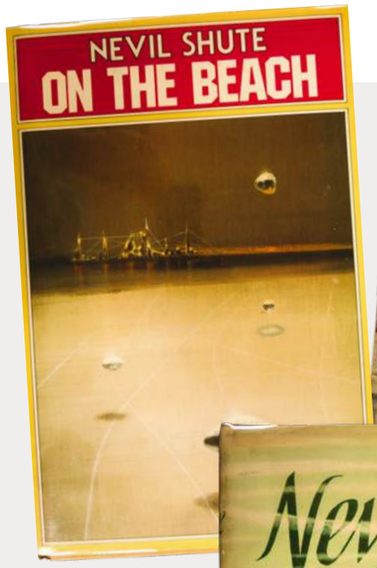
Cover of *Public Faces*, Penguin, 1944 reprinted 1945. From the Bequest of Colette Hawes. *[Balliol Library 1 c 112/9]*



Cover of *Nuclear Madness*, Autumn Press, 1978. With kind permission of Helen Caldicott. *[Balliol Library 725 e 15]*

record his wife's reaction: "Viti [Vita Sackville-West] is thrilled by the atomic bomb. She thinks, and rightly, that it will mean a whole new era." It is hard to imagine being "thrilled" by these weapons now but at the time it was possible to read them as ushering in an era of peace after years of war.

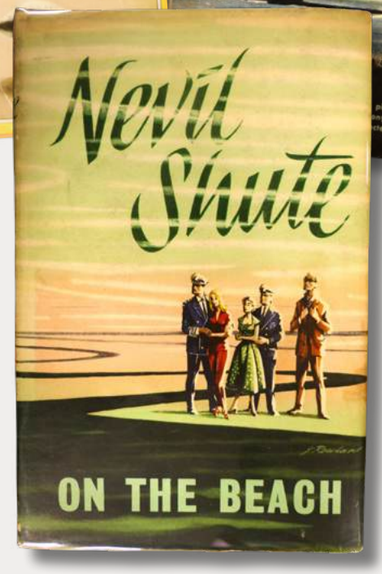
A generation later, Helen Caldicott did not share Sackville-West's enthusiasm. As a 19-year-old medical student learning about genetics and radiation she read the 1957 novel *On the Beach* by Neville Shute (Balliol 1919). Shute imagines an accidental nuclear war in the northern hemisphere from the perspective of an Australian community waiting out their last weeks before death from creeping radiation. Inspired by her horror at Shute's vision, Caldicott went on to combine a career in paediatrics with a life-long commitment to anti-nuclear activism inspiring Australian public protest that halted French nuclear testing in the South Pacific. Her 1978 book *Nuclear Madness: What You Can Do!* urges the power of public protest to change the trajectory of nuclear proliferation.



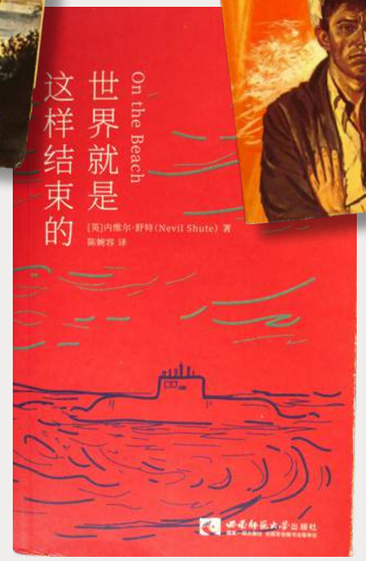
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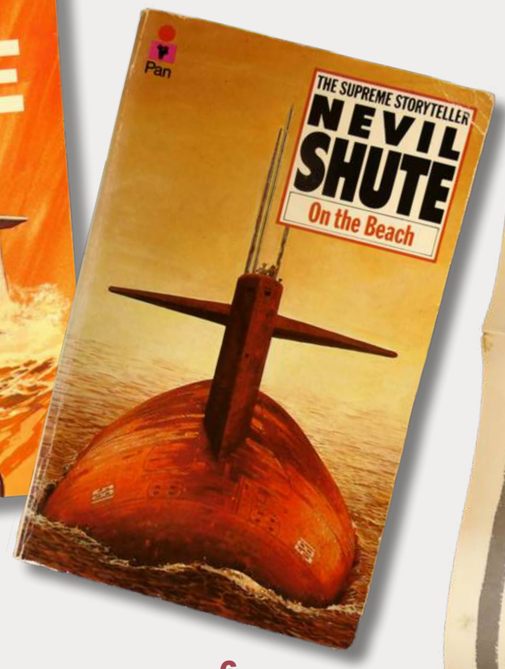
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1. Cover artwork for *On the Beach*, William Morrow book club edition, 1957. Reproduced with permission of Richard Powers Estate. *[Balliol Library 1 g 691/38]* **2.** Cover of *On the Beach*, Heinemann, 1957. *[Balliol Library 1 g 691/49]*
3. Cover of *On the Beach*, Signet, 1961. With permission of Penguin Random House. *[Balliol Library 1 g 691/47]*
4. Cover of *On the Beach*, Chinese translation, South West China Normal University Press. *[Balliol Library 1 g 691/48]*
5. Cover of *On the Beach*, Pan, 1970. Reproduced with permission from Pan Macmillan. *[Balliol Library 1 g 691/43]*
6. Cover of On the Beach, Pan, 1966. Reproduced with permission from Pan Macmillan. *[Balliol Library 1 g 691/42]*

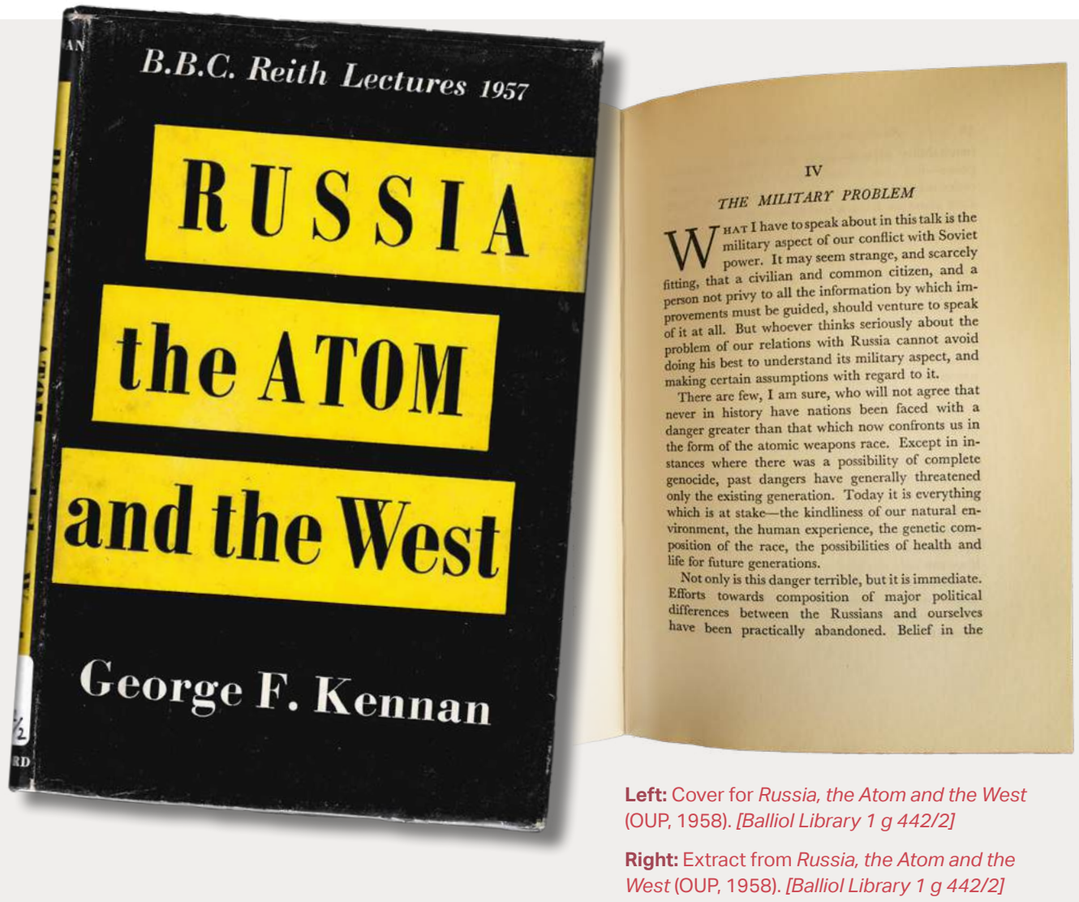
In the year *On the Beach* was published, former US Ambassador to the USSR George F. Kennan came to the UK to give the BBC's yearly Reith Lectures on Russia, the Atom and the West. During his stay in the UK Kennan was Eastman Visiting Professor at Balliol. In his lectures he identified the atomic weapons race as the greatest danger mankind has faced: "Today it is everything which is at stake – the kindliness of our natural environment, the human experience, the genetic composition of the race, the possibilities of life for future generations". He worried that the US and USSR had abandoned attempts to resolve their political differences and had accepted "belief in the inevitability of war – itself the worse disservice to peace" in "a world order marked by extreme instability".



Poster for the American release of the film *On the Beach*, 1959. *[Balliol Library BCHC 2025/020]*



Poster for the Belgian release of the film *On the Beach*. *[Balliol Library BCHC 2025/020]*



IV

THE MILITARY PROBLEM

WHAT I have to speak about in this talk is the military aspect of our conflict with Soviet power. It may seem strange, and scarcely fitting, that a civilian and common citizen, and a person not privy to all the information by which improvements must be guided, should venture to speak of it at all. But whoever thinks seriously about the problem of our relations with Russia cannot avoid doing his best to understand its military aspect, and making certain assumptions with regard to it.

There are few, I am sure, who will not agree that never in history have nations been faced with a danger greater than that which now confronts us in the form of the atomic weapons race. Except in instances where there was a possibility of complete genocide, past dangers have generally threatened only the existing generation. Today it is everything which is at stake—the kindliness of our natural environment, the human experience, the genetic composition of the race, the possibilities of health and life for future generations.

Not only is this danger terrible, but it is immediate. Efforts towards composition of major political differences between the Russians and ourselves have been practically abandoned. Belief in the

Left: Cover for *Russia, the Atom and the West* (OUP, 1958). *[Balliol Library 1 g 442/2]*

Right: Extract from *Russia, the Atom and the West* (OUP, 1958). *[Balliol Library 1 g 442/2]*

Suggesting that nuclear warfare is so dangerous that nuclear powers should disengage from involvement in world politics so as not to come to blows, he characterizes the futility of the arms race: "Are we to flee like haunted creatures from one defensive device to another…only to prolong the length of our lives while sacrificing all the values for which it might be worthwhile to live at all?". Kennan, like Caldicott, believed in the power of people to solve the problem: his solution to the perceived threat of Communist expansionism lay with the West's citizens in the form of a clear, pre-prepared civil resistance movement to Communism in countries that felt under threat.

Whilst Nicolson's *Public Faces* is currently out of print, interest in *On the Beach* has endured, as evidenced by the many editions, translations and film adaptations since its publication in 1957. In spite of Caldicott and Kennan's belief in people power, perhaps the helplessness of Shute's characters, facing a fate beyond their control, is all too relatable. Like climate change, the nuclear threat is man-made. In theory this means humans should be able to choose to come together to prevent it rather than opting to stay alone with the fear and paranoia that could trigger a nuclear war.

APOCALYPSE AVOIDED: ACCIDENTAL NUCLEAR WAR

Adam Roberts (Emeritus Fellow)

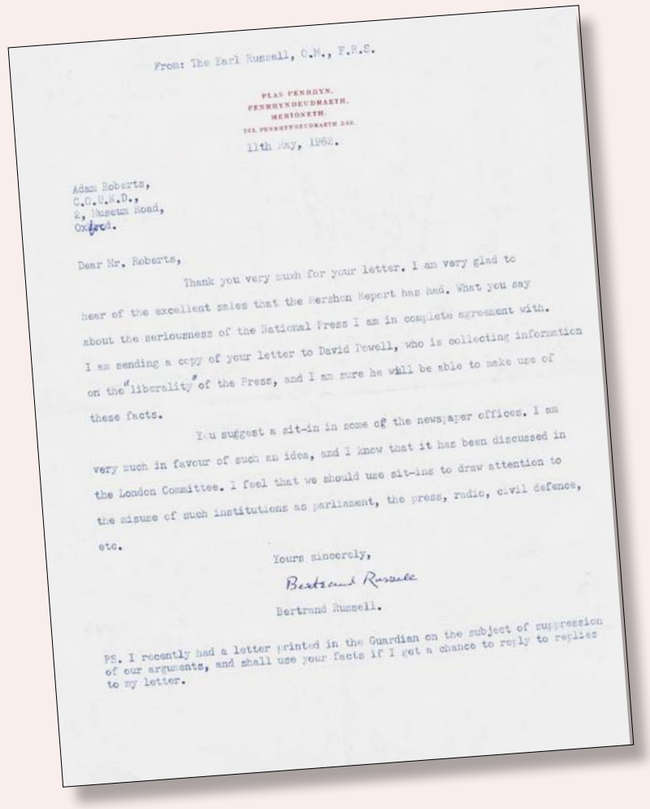
In 1959-62 I was an undergraduate, reading (supposedly) Modern History, at Magdalen College. Like many of our generation of students, I got involved in the anti-nuclear movement – marches, demonstrations, sit–downs and all. I also read what I could find about war and disarmament.

At the time, the fear of nuclear catastrophe was real. The Cold War super-powers were reliant on land-based, liquid-fuelled, ballistic missiles. A strategy and missile deployment which amounted to 'Use them or lose them' was by its very nature destabilising. Indeed, it was a recipe for apocalypse.

Yet there was a dearth of literature on many aspects of the nuclear problem, not least on the risk of unintended nuclear war. Then in 1961 (and I can't remember how) I came across a serious report on the subject. It had been produced by the Mershon National Security Program at Ohio State University in a limited edition in June 1960. I immediately decided that it should be published in the UK. With the support of fellow-students from the Campaign in Oxford University for Nuclear Disarmament, I approached Housmans, who were and remain publishers and booksellers in London. They agreed on joint publication.

It fell to me to negotiate with the staff of the Mershon Program, who were consistently friendly and professional. They were no unilateral disarmers. They rightly insisted that we must publish the whole report, and not mere extracts, but they accepted my proposal that we could include, at the beginning and the end, short notes by the publishers.

They also accepted our suggestion of asking Bertrand Russell to write an introduction. They were aware of Russell's notoriety as the principal UK advocate of civil disobedience against nuclear weapons. Russell duly obliged. His text ended with a prediction of apocalypse: 'The sombre conclusion is that, unless the policies of the Great Powers are radically changed within the next few years, the chances of human survival are very slight.'



From: The Earl Russell, O.M., F.R.S.

PLAS PENRHYN,
PENRHYNDEUDRAETH.
MERIONETH.
FFR. PENRHYNDEUDRAETH 240.

11th May, 1962.

Adam Roberts,
C.C.U.A.E.D.,
2, Chaucer Road,
Oxford.

Dear Mr. Roberts,

Thank you very much for your letter. I am very glad to hear of the excellent sales that the Mershon Report has had. What you say about the seriousness of the National Press I am in complete agreement with. I am sending a copy of your letter to David Powell, who is collecting information on the "liberality" of the Press, and I am sure he will be able to make use of these facts.

You suggest a sit-in in some of the newspaper offices. I am very much in favour of such an idea, and I know that it has been discussed in the London Committee. I feel that we should use sit-ins to draw attention to the misuse of such institutions as parliament, the press, radio, civil defence, etc.

Yours sincerely,

Bertrand Russell

Bertrand Russell.

PS. I recently had a letter printed in the Guardian on the subject of suppression of our arguments, and shall use your facts if I get a chance to reply to replies to my letter.

Letter to Adam Roberts from Bertrand Russell. *[Loaned by Adam Roberts (Emeritus Fellow)]*

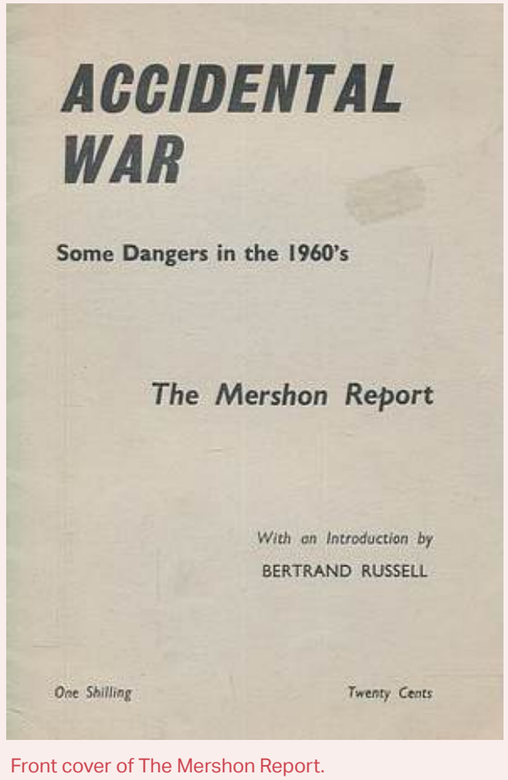
How was the report received? It certainly sold well, as it deserved to. At 24 pages, decently produced by a printing firm in Queen Street, it was sold at a bargain price of one shilling (or 5 pence post-decimalisation 1971). There were four printings in just over a year:

February 1962	4000 copies
April 1962	6000 copies
September 1962	3000 copies
March 1963	4000 copies

What do I think of this work now? The main text of the Mershon Report stands up well. Its sections on Accidental War in History, and on Prevailing Opinion about accidental war, are excellent. Its core, on Specific Dangers in the 1960's, is as succinct an account of the many possible dimensions of accidental war as you will find anywhere. As to their Conclusions, the authors were at least half-right when they said that 'vulnerable strategic forces, such as manned bombers and some liquid-fuelled ballistic missiles, tend to be dangerous.'

As for Russell's Introduction, I now feel that I was lucky. If I had known how erratic his views on the use of force in past conflicts had been, I would have hesitated before asking him. And if I had also known the intemperate language and numerous inaccuracies of his later works, including in his *War Crimes in Vietnam* (1967), I would not have wanted a contribution from him. I did not know these things, and what Russell wrote in the Introduction was OK.

More than sixty years after the Mershon Report was published, where does the concept of accidental war stand? Since 1960, numerous actual wars and incidents, and historical accounts of earlier wars, have provided evidence that the concept of accidental war, concern about it, and indeed fear of it, is still alive and kicking. Here I will mention just three cases.



Front cover of The Mershon Report.
[Loaned by Adam Roberts (Emeritus Fellow)]

1. Depiction of past wars as accidental: major powers in 1914.

The Mershon Report (p. 7) had touched on this issue. In recent years, the proposition that the outbreak of the First World War in 1914 was largely unintended has gained ground. It was most notably advanced by the Cambridge historian, Christopher Clark, in his book *The Sleepwalkers: How Europe Went to War in 1914* (Penguin, 2013). This sees the 1914 war as a consequence of decisions not just in one country but in several. It concludes that 'the outbreak of the war was a tragedy, not a crime.' This thesis is by no means universally accepted, but it has contributed to the idea that sleepwalking may be one possible cause of apocalypse.

This raises the difficult question. Does the idea that a war may be at least partly accidental mean that no one country, and no one leader, can be held responsible for it? As regards road accidents, societies sometimes manage to combine the language of 'accident' with a case for prosecution. Why should that be impossible in war?

2. US Risks during the Cuban Missile Criss of October-November 1962.

There were risks of accidental war at several stages of the crisis. Max Hastings emphasized these aspects in his book *The Abyss: The Cuban Missile Crisis 1962* (Christopher Collins, 2022). He notes how some hawks in the US government and armed forces were keen to use force, even nuclear weapons: this would not be exactly accidental war, but it could have resulted in a war not intended by the US government. Hastings refers to the woeful inadequacy of US naval communication, which caused confusion and tension at the White House (p. 334–5.) There were also some technical malfunctions on the US side that could have had disastrous consequences. For example, on 28 October a ballistic missile was reported to have been launched from Cuba. The US Strategic Air Command was notified just minutes before the missile was due to impact eighteen miles West of Tampa. After some anxious minutes of waiting, nothing happened. It turned out that the alert had been triggered by an early warning radar in New Jersey, whose operators 'ran a test tape, simulating an attack just as another radar site pinpointed a satellite' (pp. 328 & 424).

3. USSR Risks. Technical malfunction leading to a near-miss.

Of the many episodes in the Cold War that may have involved a risk of accidental war, one stands out. It was an incident that resulted in the apparently deliberate avoidance of a possible accidental nuclear war. There are some inconsistencies about how the story is told, but all versions contain common elements. I have drawn mainly on David Hoffman, 'When One Man Helped Avert Nuclear War', *Washington Post*, 1 February 1999. On 26 September 1983, at a time of high tension between the Soviet Union and the United States, the Soviet early warning system reported the launch of between one and five missiles from the US in the direction of USSR. The recipient of this information, in his headquarters near Moscow, was Lt.-Colonel Stanislav Petrov, an engineer in the Soviet Air Defence Forces. He suspected that it was a false alarm. He did not pass the information up the chain of command, which could well have led to a decision to launch Soviet weaponry. He later indicated that he could not believe that, if the US were to attack, it would do so with such a small force.

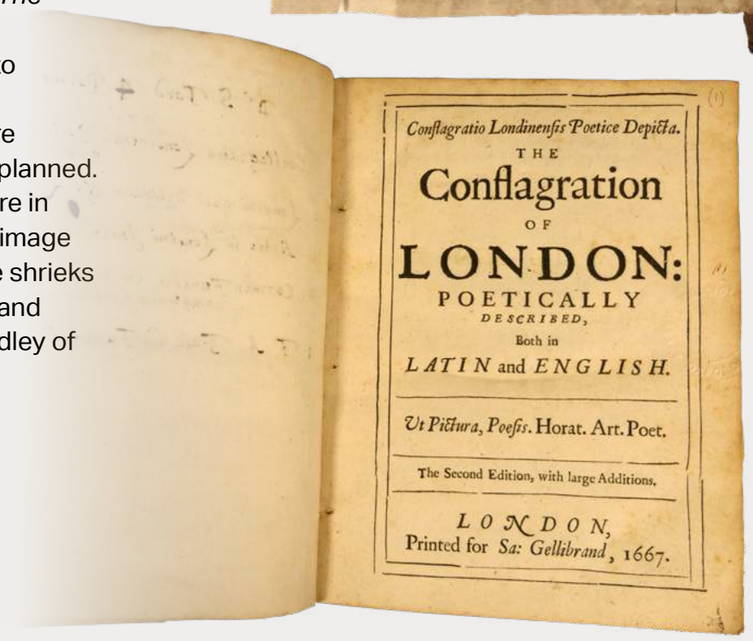
What was the cause of the false alarms? It emerged that they were caused by a rare alignment of sunlight on high-altitude clouds and launch sites for intercontinental ballistic missiles in Montana. Petrov, the hero of this episode, died in 2017. I don't suppose he had read either the Mershon Report or Christopher Clark's book, but he deserves our thanks for having been alert to the possibility of war by accident. For once at least, apocalypse was averted.

VISION 4: FIRE

The Conflagration of London

Fire contributes to the mood of encroaching, relentless terror in the vision of the Apocalypse in the Lutheran Bible on page 6. Gold tipped flames shoot up from the hell mouth and smoke roils around the four horsemen. Next to it, Burnet's *The Theory of the Earth* depicts the end of the world by conflagration with an image of the whole globe consumed by an inferno.

The Great Fire of London in 1666 felt like the end of the world to inhabitants of the city. In the aftermath, they tried to make sense of what had happened through poetry, sermons, and enquiries. Simon Ford's poem *The Conflagration of London* ends with an extra verse explaining to his engraver why he will not be including their picture of the fire at the beginning of the text as planned. It describes the horror of the fire in sensory terms and rejects the image because it cannot "express the shrieks and cries that rent the clouds, and melting skies" or "draw the medley of compounded smells".


Conflagratio Londinensis Poetice Depicta.

THE

Conflagration

OF

LONDON:

POETICALLY

DESCRIBED,

Both in

LATIN and ENGLISH.

Ut Pictura, Poesis. Horat. Art. Poet.

The Second Edition, with large Additions.

LONDON,

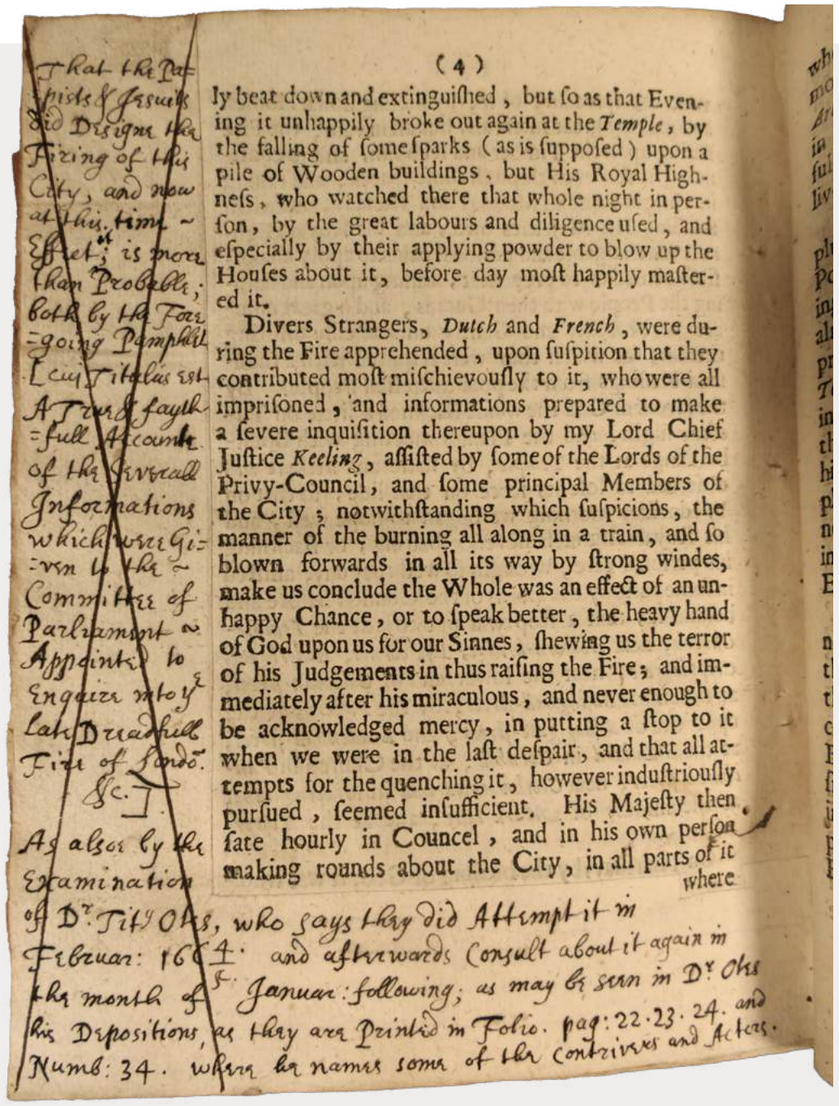
Printed for Sa: Gellibrand, 1667.

Title page from Simon's Ford's *The Conflagration of London*. Second edition. (Printed for Sa: Gellibrand, 1667). *[Balliol Library 910 i 8 (1)]*



Title page and plate showing the Fire of London from Samuel Rolle's *[Shilhavtiyah]* or, *The Burning of London in the Year 1666*. (Printed by R.I. for Thomas Parkhurst, 1667). *[Balliol Library Arch A 9 9]*

Samuel Rolle's meditations on the fire show no such compunction, opening with a fold-out plate of the burning viewed from across the Thames. Rolle sees the fire as God's judgement and analyses each detail for its moral implications. Meditation 23, "upon the place this dreadful fire began, viz. Bakers-House in Pudding-lane", likens "the Burning of London by that obscure Lane" to "the killing of the great Giant Goliath by a Pibble-Stone". He goes on to point out that the impact was on rich and poor alike: "though this fire began with a Baker's-House, yet its ambition … was not satisfied until it had consumed the Houses of Chief-Magistrates". For Rolle, fire is a levelling form of destruction.


That the Papists & Jesuits did Design the Firing of this City, and now at this time Effect it; is more than Probable; both by the Fore-going Pamphlet Entituled A True & faithfull Account of the several Informations which were Given to the Committee of Parliament Appointed to Enquire into the Late Dreadfull Fire of London &c.

As also by the Examination of Dr. Titus Oats, who says they did Attempt it in Februar: 1664. and afterwards Consult about it again in the month of Jan. Januar: following; as may be seen in Dr. Oats his Depositions, as they are Printed in Folio. pag: 22. 23. 24. and Numb: 34. where he names some of the Contrivers and Actors.

(4)

ly beat down and extinguished, but so as that Evening it unhappily broke out again at the *Temple*, by the falling of some sparks (as is supposed) upon a pile of Wooden buildings, but His Royal Highness, who watched there that whole night in person, by the great labours and diligence used, and especially by their applying powder to blow up the Houses about it, before day most happily mastered it.

Divers Strangers, *Dutch* and *French*, were during the Fire apprehended, upon suspition that they contributed most mischievously to it, who were all imprisoned, and informations prepared to make a severe inquisition thereupon by my Lord Chief Justice *Keeling*, assisted by some of the Lords of the Privy-Council, and some principal Members of the City; notwithstanding which suspicions, the manner of the burning all along in a train, and so blown forwards in all its way by strong windes, make us conclude the Whole was an effect of an unhappy Chance, or to speak better, the heavy hand of God upon us for our Sinnes, shewing us the terror of his Judgements in thus raising the Fire; and immediately after his miraculous, and never enough to be acknowledged mercy, in putting a stop to it when we were in the last despair, and that all attempts for the quenching it, however industriously pursued, seemed insufficient. His Majesty then sate hourly in Councel, and in his own person making rounds about the City, in all parts of it where

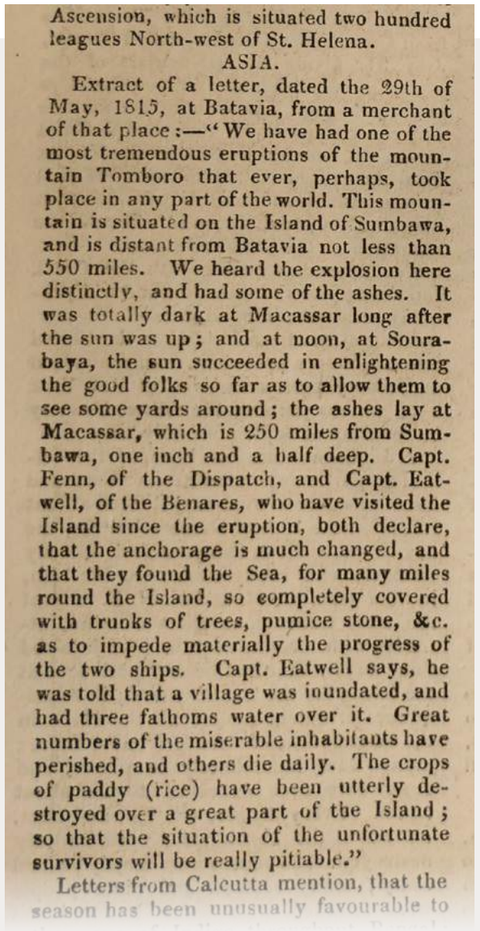
Nicholas Crouch's marginal note from *Observations Both Historical and Moral upon the Burning of London, September 1666.* (Printed by Thomas Ratcliffe, and are to be sold by Robert Pawlet at the Bible in Chancery-lane., 1667). *[Balliol Library 915 f 9 (20)]*

Others were looking for someone earthly to blame. The author of *Observations Both Historical and Moral upon the Burning of London,* September 1666, whilst agreeing with Rolle that it was an accident brought about by the hand of God, records the arrests of foreigners suspected of contributing to the fire. In the margin of Balliol's copy, former owner, Nicholas Crouch suspects Catholic terrorism: "That the Papists & Jesuits did design the Firing of this City, and now at this time effect it, is more that probable". As evidence he quotes the testimony of Titus Oates, the religious fantasist whose report of a Popish Plot to kill Charles II led to the deaths of 35 people. Maybe Crouch re-examined his views and crossed out the note when the plot was totally discredited.

Volcanic Winter

Whilst terrible to those they touch, localised fires are not an existential threat to life on earth. Fire from within the earth, however, might be. Super volcanoes like the Yellowstone caldera could cause "a volcanic winter" causing food shortages and potential civilizational collapse. The eruption of Mount Tambora on 5 April 1815 is the largest in recorded history. It caused global cooling of 1°C leading to crop failures and summer snows around the world. The contemporary *Gentleman's Magazine* remarks on the unseasonal weather, but it was not until the twentieth century that scientists made the link.[vii]

Seventeenth-century polymath, Athanasius Kircher, was fascinated by everything including what went on inside the earth. He even had himself lowered into the active crater of Mount Vesuvius in his attempts to find out. In his *Mundus Subterraneus (Underground World)* he included an illustration showing what he imagined was down there. Although his picture does not tally exactly with what we now know, some of his ideas have since been borne out by research, including a central source of heat inside the planet. The ongoing curiosity of earth scientists, biologists, climatologists, and others who study our planet could be a reason to be cheerful. The more we understand about our world, the better equipped we might be to continue to live here.

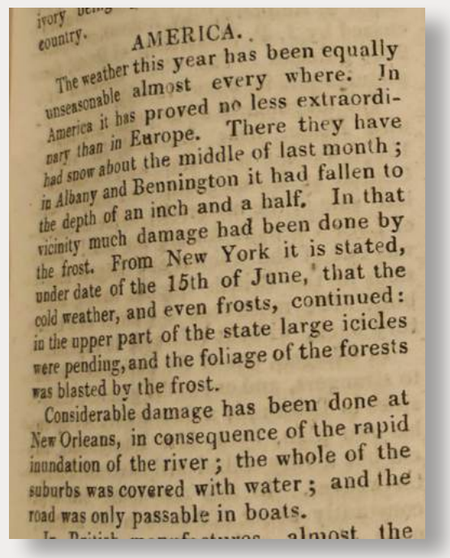

Ascension, which is situated two hundred leagues North-west of St. Helena.

ASIA.

Extract of a letter, dated the 29th of May, 1815, at Batavia, from a merchant of that place:—"We have had one of the most tremendous eruptions of the mountain Tomboro that ever, perhaps, took place in any part of the world. This mountain is situated on the Island of Sumbawa, and is distant from Batavia not less than 550 miles. We heard the explosion here distinctly, and had some of the ashes. It was totally dark at Macassar long after the sun was up; and at noon, at Sourabaya, the sun succeeded in enlightening the good folks so far as to allow them to see some yards around; the ashes lay at Macassar, which is 250 miles from Sumbawa, one inch and a half deep. Capt. Fenn, of the Dispatch, and Capt. Eatwell, of the Benares, who have visited the Island since the eruption, both declare, that the anchorage is much changed, and that they found the Sea, for many miles round the Island, so completely covered with trunks of trees, pumice stone, &c. as to impede materially the progress of the two ships. Capt. Eatwell says, he was told that a village was inundated, and had three fathoms water over it. Great numbers of the miserable inhabitants have perished, and others die daily. The crops of paddy (rice) have been utterly destroyed over a great part of the Island; so that the situation of the unfortunate survivors will be really pitiable."

Letters from Calcutta mention, that the season has been unusually favourable to

Account of the eruption of Mount Tambora from *The Gentleman's Magazine* 1815, page 558. *[Balliol Library]*


country.

AMERICA.

The weather this year has been equally unseasonable almost every where. In America it has proved no less extraordinary than in Europe. There they have had snow about the middle of last month; in Albany and Bennington it had fallen to the depth of an inch and a half. In that vicinity much damage had been done by the frost. From New York it is stated, under date of the 15th of June, that the cold weather, and even frosts, continued: in the upper part of the state large icicles were pending, and the foliage of the forests was blasted by the frost.

Considerable damage has been done at New Orleans, in consequence of the rapid inundation of the river; the whole of the suburbs was covered with water; and the road was only passable in boats.

Account of the global cold weather resulting from the eruption of Mount Tambora the previous year from *The Gentleman's Magazine* 1816, page 75. *[Balliol Library]*

PRÆFATIO.

CAPUT III.

De Montis Vesuvii, *reliquarumque Insularum exploratione ab Auctore facta.*

POsti tanta mari terraque exantlata discrimina, post exploratam incredibilem Naturæ in subterraneis cuniculis operantis potentiam, ingens animum meum subiit desiderium cognoscendi, num & *Vesuvius* nonnulla cum *Strongylo*, & *Ætna* occultæ negotiationis, in tam potenti Naturæ bello, obtinuisset commercia? Porticum concessi, ad radices montis situm oppidum; hinc fideli & viarum gnaro comite rustico, opima sane mercede conducto, media nocte montem per difficiles, salebrosas arduasque vias conscendi, cujus craterem cum jam obtinuissem, horrendum dictu, totum igne illuminatum vidi cum intolerabili *sulphuris & bituminis* ardentis mephiti. Hic prorsus ad inusitatum rei spectaculum attonitus, inferorum domicilium me intueri credebam, in quo præter dæmonum horrenda phasmata, nil adeò aliud deesse videbatur. Horrendi percipiebantur montis mugitus & fremitus, putor inexplicabilis, fumi subfuscis ignium globis mixti, quos ex undecim diversis locis, tum fundus, tum latera montis continuò eructabant, identidem me illud eructare cogebant: *O Altitudo divitiarum sapientiæ & scientiæ* DEI, *quam incomprehensibiles sunt viæ tuæ!* Si potentiam tuam tam formidandis Naturæ portentis contra prævaricantis humani generis malitiam ostendis, quid erit in illo novissimo die, quo Terra irâ furoris tui submersa, elementa calore solventur?

Aurorâ itaque illucescente, ego, ut totius interioris montis constitutionem ea, qua fieri poterat, diligentia explorarem, locum tutum & ad firmanda vestigia securum elegi, quæ erat rupes ingens superficie plana, ad quam per declive montis aliquousque aditus patebat, me demisi; hic deprompto Pantometro montis dimensionem exorsus, *crateris ambitum* 300 ferè millia passuum, 800 verò passus *profunditatem* Geometrico ratiocinio continere deprehendi. Mons undique præruptus; nulla, qua aditus ad interiora patebat, declivitate data, in excavati cylindri formam κατὰ τὰς ὀρθὰς, ambitu suo descendebat; & quamvis fundus oculis nostris strictiori peripheria concluſus videretur, id tamen juxta Opticas rationes & leges, non nisi ex maxima à crateris intima superficie, distantia & profunditate contingebat. In Centro fundi Natura suum veluti *focum* constituisse videbatur; verè Vulcaniæ culinæ officinam lempiterno fumi flammarumque profluvio fervidam, in decoquendis sulphure, bitumine, cæterisque mineralium speciebus, eliquandis exurendisque, occulto quodam molimine funestisque stragibus paulò post edendis occupatam: siquidem halitus intus concluſi, uti contineri nescii, ita tanto impetu & vehementia horrendis fragoribus sociata impositum sibi onus discutiebat, ut mons terræ tremore agitari videretur: quod quandocunque accidebat, partes supremæ montis molliores, quæ ex cinere, pluviis, cæterisque Mineralium quisquilis coagmentabantur, tremore concussæ solutæque, collium instar in barathri fundum concidentes, ex varia soni reflexione, eum fragorem, quantum quispiam etiam imperterriti pectoris vir sustinere vix posset, concitabant. *Materia*, quæ ex centro montis continuo eructabatur, novum veluti montem efficiebat, mira striarum varietate præditum, quam varia mineralium liquefactorum ebullitio in omnes circumferentiæ partes fluxu suo, coloreque nunc viridi ex ære, modo fulvo ex sulphure, arsenico & sandarachâ, jam rubro ex cinnabrio minioque, jam nigro, ex vitriolo aquis mixto, vel ex ipsis cineribus cinericio, ingenioso Naturæ penicillo efformabat: verum hæc omnia in apposita *figura* Lector consideret. Monticulus hic post ultimum montis incendium quod

Anno



Mount Vesuvius from Athanasius Kircher's *Mundus Subterraneus* (Apud Joannem Janssonium a Waesberge & filios, 1578).
[Balliol Library 30 h 10]

Rivers of fire inside the Earth from Athanasius Kircher's *Mundus Subterraneus*. (Apud Joannem Janssonium a Waesberge & filios, 1578). *[Balliol Library 30 h 10]*

Sect. I. stantia quos similitudo studiorum conjungit) audebo consulere *Primò*, quænam *Consequentiæ* ab Observationibus his juxta bonæ Philosophiæ regulas inferantur? *Secundo*, An alia debeat fieri Observatio, quæ factas possit delucidare?

CAPUT VI.

Montes Ignivomi *in externa Telluris superficie spectabiles* Terram plenam Ignibus *esse, satis* demonstrant.

Cap. VI. SI exullo signo *Ignis Subterranei* veritatem cognoscere possumus, certè ex *Montibus flammivomis* aliisque *Sulphureis Crateribus*, quos *Vulcanios* vocant, eam ita luculenter spectamus, ut qui eam negare voluerit, omnium opinione temerarius, ne dicam vesanus & stolidus existimari debeat; cum eorum multitudo & varietas tanta sit ut nulla ferè sit in Orbe Regio quæ non illos exhibeat, uti apertè ostendimus in *Mappa nostra universali*. Et ut à notioribus incipiamus, est in Sicilia *Ætna* omnium tum Poëtarum tum Historicorum monumentis celeberrimus, cujus arcanam constitutionem in *sequentibus* describam, utpote αὐτόπτης testis, & *dicti Montis* explorator.

Ab *Ætna* 150 mill. pass. dissitæ sunt *Insulæ Liparitanæ* sive *Æoliæ*, aut *Hephæstiæ* à Græcis dictæ, à Latinis *Vulcaniæ*, & sunt *septem*, videlicet Strongyle, Lipara, Hiera hodie *Vulcano*, Hicesia vel Salona, Ericusa vel Alicur, Phœnicusa vel Phelicur, Euonymos, Ptolemæus. à *Ptolomæo* dicta Istica & Didyme; quæ olim Plinius. teste *Plinio* omnes *arsisse* feruntur; hodie *Strongylus* solus ex septem, *incendiis* sævit, Strabo. non inferioribus *Ætnæis* aut *Vesuvianis*. *Strabone* teste, olim unà cum *Montibus* & *Mare* totum *arsisse* dicuntur.

Anno 1638 cum occasione Triremium Melitensium hasce præterveherer, descensione factâ inter alias, *Vulcanum* & *Strongylum* examinandum duxi; & *Strongylus* quidem ob *ignes* quos continuo evomebat, omnem accessum intercludebat. *Vulcanus* verò induciis cum æstuariis factis, præter *fumum* nil aliud monstrabat; habet tamen adjunctam Insulam, quam *Vulcanellum* vocant, *Vulcano* adnexam, quam ex rejectamentis Montis ex *ultimo incendio* eructatis natam ferunt. Omnes Insulæ *sulphure, nitro, bitumine* scatent, quin & fundum Maris cavernis innumeris pertusum esse, tum Vortices, tum exeuntium Ventorum, Mare mirum in modum inflantium, frequentia indicat. Ut proinde minimè ab iis dissentire queam, qui ajunt, *minas* & cuniculos submarinos cum *Ætna*, & deinde continuatis per dorsi *Apennini* concava ductibus cum *Vesuvio* correspondere; quod verissimum esse Anno 1638, quo *Calabria* in ultimam penè ruinam Terræmotuum sævitie redacta fuit, præsens & oculatus testis comperi. Vide quæ de hisce in *Præfat.* hujus Operis fusissimè tradidi.

Montes flammivomi Italiæ.

Est in Campania *Vesuvius*, cujus historiam vide, si placet, Lector, in *Prolegomenis* hujus Operis; hos enim *recensitos Montes* cum Anno 1638 adscendissem, cunctaque non sine manifesto vitæ periculo observassem, observata in iis omnem fidem superantia, tantum in me potuerunt ut vel hinc præsentis hujus Operis auspicandi *occasionem* & originem sumpserim.

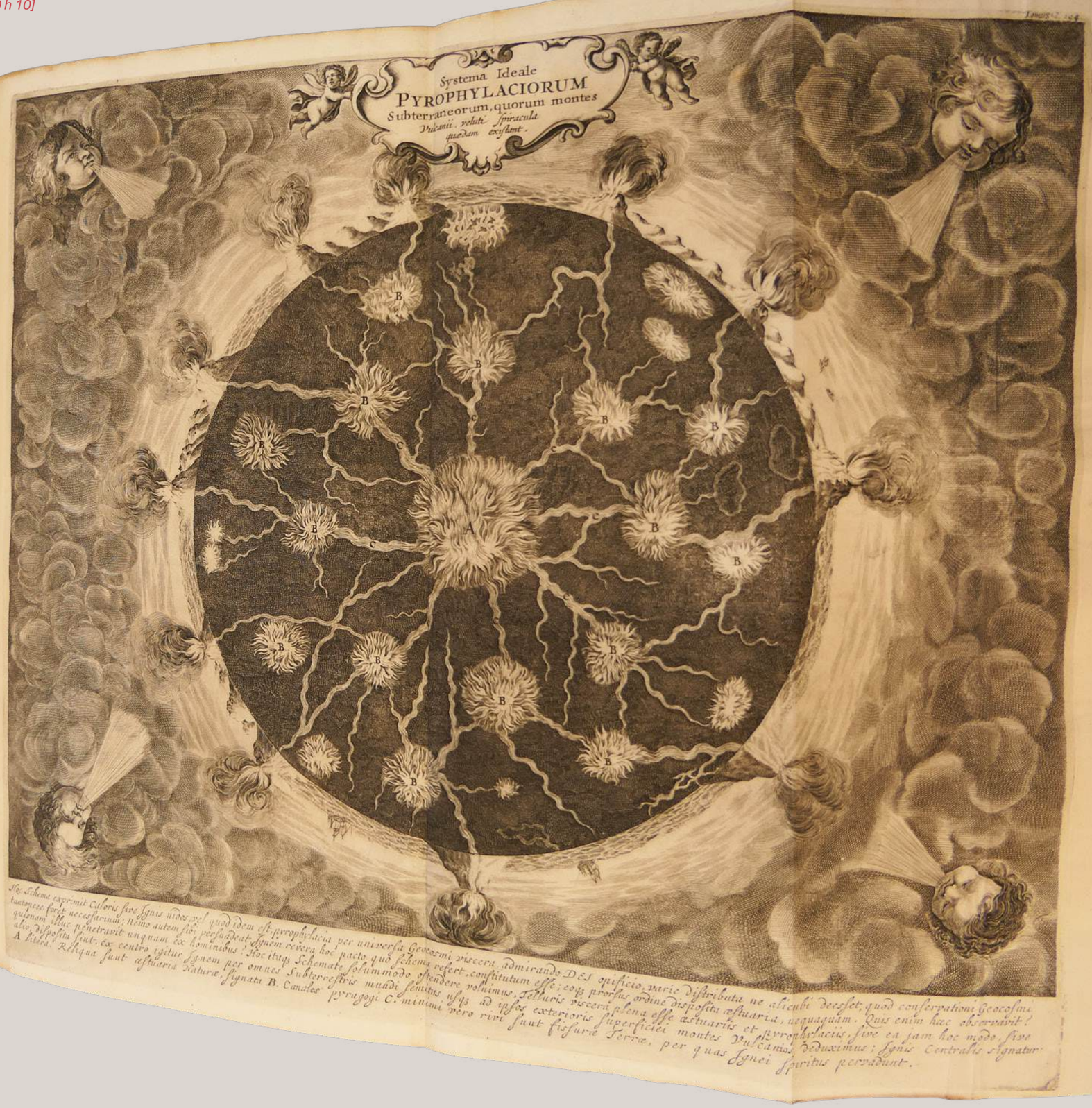
Habet & Hetruria *ardentem* in *Apennino Montem*, in Felsina sive *Bononiensi Agro* alterum; non desunt præterea inter Pistorium & Petram Malam *Lacunæ* & *Antra* perpetuos noctu præsertim, *flammarum globos* eructantia. Notantur & in Mutinensi Agro duo famosa *plena incendiis* loca, de quibus in *præcedentibus*. Venio ad Germaniam, Galliam, Germania Vulcani Gratia. Hispaniam; in quibus etiamsi Montes recensitis similes non spectentur, frequentes tamen tum *Sulphurei Crateres* & *Lacunæ* fumum *flammas*que evomentes, tum innumerabilis ubique locorum thermarum multitudo, de quibus suo loco, *Subterranei Ignis* intra eorum *Hydrophylacia* serpentis, luculentissima præbent vestigia. In Misnia *Carbonum Mons* subinde fumo & *igne* sævit. In Lappia Montes præcelsos in Ætnæ similitudinem *flammas* eructare *Olaus* narrat. Olaus M.

In Islandia quis nescit *Heclam* Montem *incendiis* omnium Geographorum relatione famosissimum, cujus ad miracula Naturæ accedere videtur, quod *vertex* ejus perpetua *nive* candeat, *radix* inextinguibilibus *incendiis flagrans* Voraginumque abditarum frequentia nulli ad plurima etiam stadia aditum præbeat, faxorum cinerumque eructatione omnes circumsitos Campos in sterilitatem unà cum formidabili sonitu & fragore deducat; quem dum audiunt incolæ, animas impiorum cum ejulatu miserabili ibidem torqueri, superstitiosius credunt. Vide *Olaum* Olaus M. *Magnum*, cæterosque Geographos in Descriptione hujus Insulæ.

Et nè ultimam Septentrionis Plagam perenni frigoris glacieique inclementia damnatam fine ullo *caloris remedio* Natura reliquisse videatur, in Insula quam Groenlandiam vocant, Polo proxima ingentem constituit *Vulcanium Montem*, ad cujus radices Monasterium Ord. Prædicatorum, quod *D. Thomæ* vocant, tophaceis lapidibus ex Montium rejectamentis constructum est; de quo plurima admiratione dignissima refert, omnium harum memorabilium rerum inspector *Bartholom. Zenetus* Venetus, in eas oras nescio quo casu conjectus. Verba ejus sunt: *Hic visitur Monasterium* S. Thomæ *Dominicanorum, & ab eo non procul* Mons Ignivomus, *ex cujus pede* Fons ignitus *erumpit*; *Hujus* Fontis aquis *per tubos derivatis, non modo omnes* cellæ *Monachorum instar hypocaustorum*

Groenlandiæ Vulcanius Mons.

Mira de Monasterio D. Thomæ in Groenlandia.



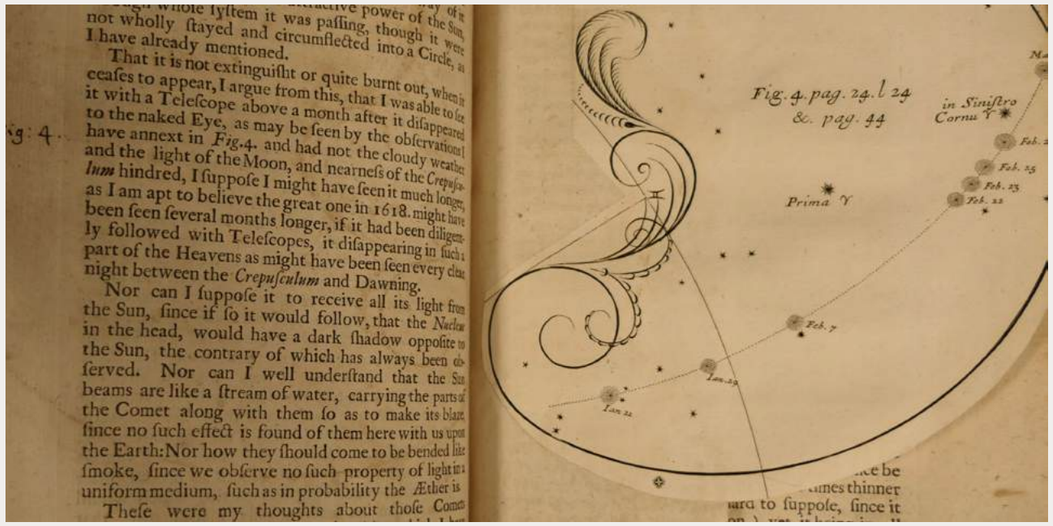
Hoc Schema exprimit Caloris sive Ignis vires, vel quod idem est, pyrophylacia per universa Geocosmi viscera admirando DEI opificio, varie distributa ne alicubi deesset, quod conservationi Geocosmi tantopere foret necessarium; Nemo autem sibi persuadeat, Ignem revera hoc pacto quo Schema refert, constitutum esse; eos prorsus ordine disposita æstuaria, nequaquam. Quis enim hæc observavit? quisnam illuc penetravit unquam ex hominibus? Hoc itaq; Schemate solummodo ostendere voluimus, Telluris viscera plena esse æstuariis et pyrophylacus, sive ea jam hoc modo, sive alio, dispositis sint, ex centro igitur Ignem per omnes Subterrestris muadi semitas usq; ad ipsos exterioris superficiei montes Vulcanios deduximus; Ignis Centralis Agnatur A littera. Reliqua sunt æstuaria Naturæ, signata B. Canales pyrogoi C. minimi vero rivi sunt fissuræ Terræ, per quas Igniei spiritus pervadunt.

VISION 5: IT CAME FROM OUTER SPACE?

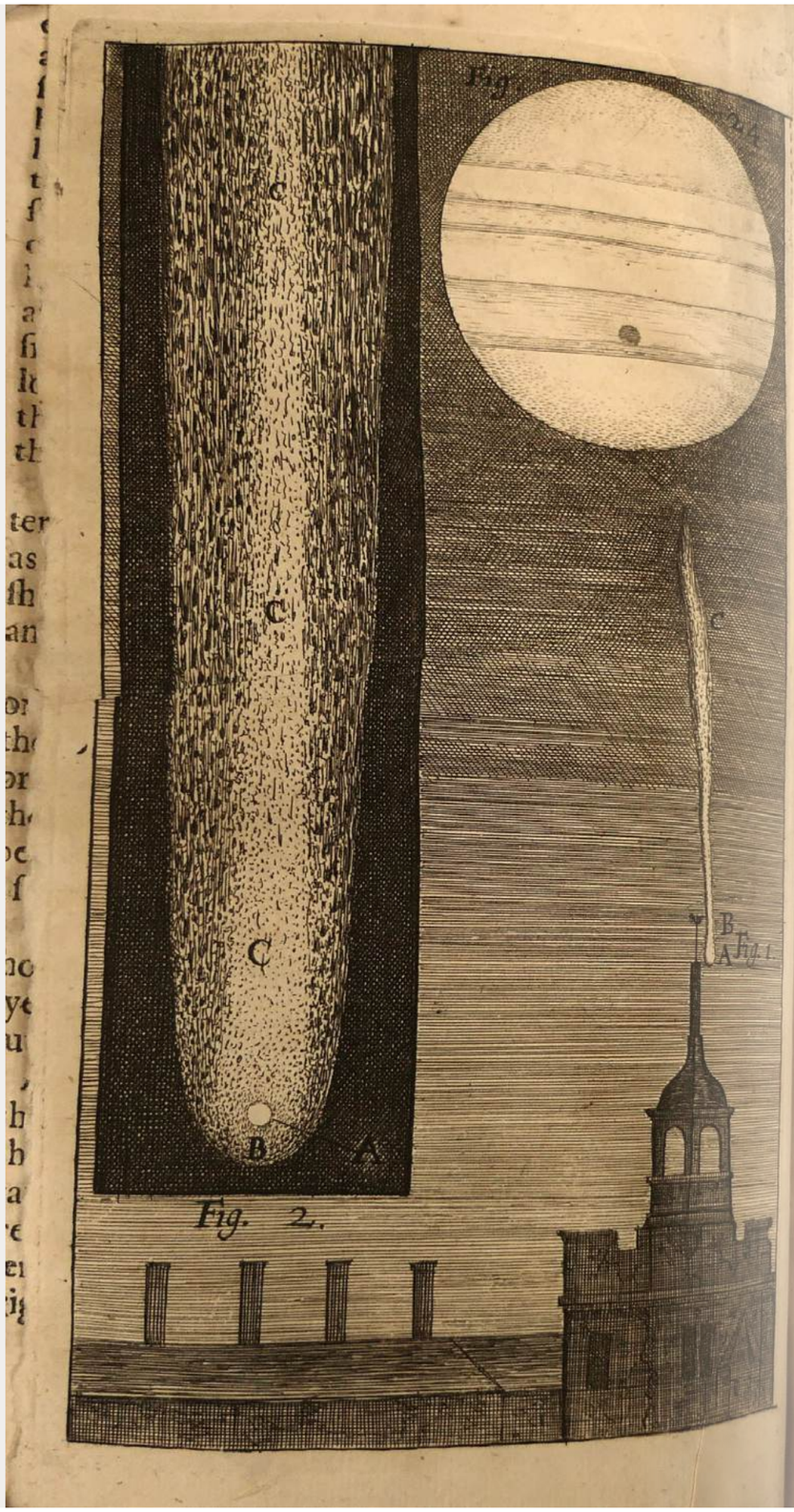
Comets and Asteroids

In many of the early printed books in Balliol's collections comets and asteroids are not objects to be feared in themselves but bad omens foreshadowing wars, fires or famines. In the mid-17th-century, when Robert Hooke published these drawings documenting his observations, the focus had shifted to what these extraterrestrial bodies were and how and why they moved in the way they did.

20th-century research recognised the existential risk from comets and asteroids when it identified an impact crater in Mexico dated to 66 million years ago. The interstellar object that created this was theorized to have triggered a darkening and cooling of the Earth that caused the mass extinction of the dinosaurs. Could this happen again? There's a risk but Toby Ord (Balliol 2003) estimates it to be much lower than the risk from any man-made catastrophes.[viii]



Observations of 1664 comet from Robert Hooke's *Cometa*. (Printed for J. Martyn, printer to the Royal Society, at the Bell in St. Paul's Church-yard, 1978). *[Balliol Library 910 i 2 (5)]*



A comet from Robert Hooke's *Cometa*. (Printed for J. Martyn, printer to the Royal Society, at the Bell in St. Paul's Church-yard, 1978). *[Balliol Library 910 i 2 (5)]*



Diz Wallis' illustration from *How to Keep Dinosaurs* by Robert Mash (Andre Deutsch, 1983). With kind permission from Diz Wallis. *[Balliol Library 1 e 91]*

What if that reptilian mass extinction had never happened? Perhaps humans would not have evolved or perhaps, as Robert Mash (Balliol 1958) playfully imagines in *How to Keep your Dinosaur*, humans and dinos would live side by side.

Mash's illustrators, Diz Wallis and Philip Hood, also contributed to *After Man: A Zoology of the Future* by speculative Zoologist Dougal Dixon which draws on evolutionary theory to imagine Earth 50 million years in the future. In this vision, humans are extinct having technologically side-stepped evolution only to create a world so overpopulated and complicated that "ultimately the earth could no longer supply the raw materials needed … as shortage of supply caused the collapse of one structure after another, his whole complex and interlocking social and technological edifice crumbled". The animals that survive are "those man regards as pests and vermin". For example, the Falanx, predator rats, pictured hunting a Rabbuck, grazers evolved from rabbits.

The idea that there could still be life on earth even if humans make existentially disastrous mistakes is, in some ways, uplifting. This copy cheered one little boy after a dental operation, and he has been enjoying it ever since.



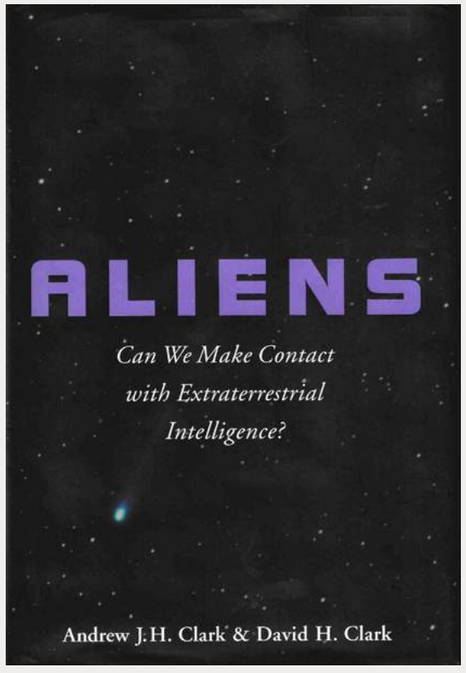
Diz Wallis' illustration Illustration from *After Man* by Dougal Dixon (Granada, 1981). With kind permission from Diz Wallis. *[Loaned from private collection]*

Extraterrestrial Intelligence

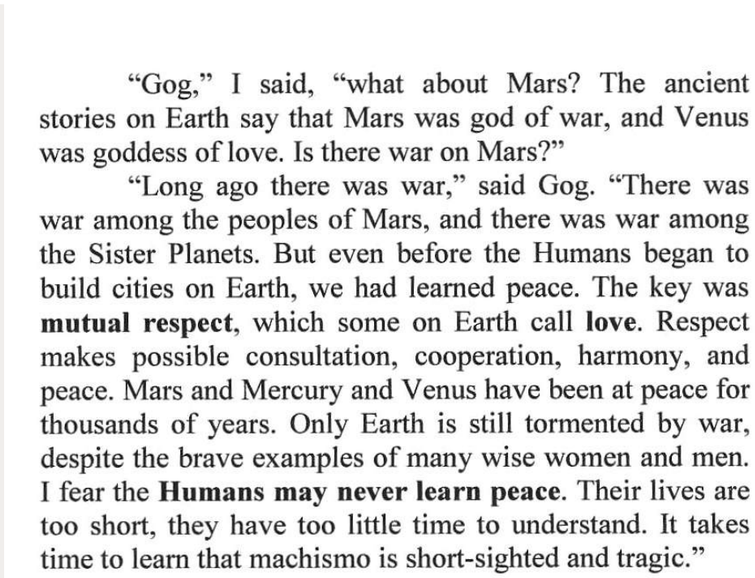
We've seen the films - *Independence Day, War of the Worlds* – surely if the aliens come it will be to end the world as we know it. In her BBC World Service documentary "First Contact" Farrah Jarral (Balliol 2000) interviews science-fiction writer Nnedi Okorafor who presents an alternative first contact situation in her novel Lagoon. Together they scrutinise the assumption that aliens would be a destructive force. Okorafor points out that as we know nothing about extraterrestrials, "we're filling in that gap with things that we know … colonisation, exploitation, violence". Jarral goes on to reflect that at the same time that the popular imagination of aliens "reflects humanity's history of plundering and colonisation of militarily weaker societies", we are positioning ourselves as colonisers of space. We lack the self-awareness about how this might impact our first impressions on our intergalactic neighbours: "Can we ever escape our own emotional baggage and find ways to communicate peacefully with someone or something potentially so very different from ourselves".[ix]

In *Aliens: Can We Make Contact with Extraterrestrial Intelligence?* Andrew J. H. Clark (Balliol 1993) and David H. Clark do not concentrate on the moment of contact with extraterrestrial intelligence (ETI) but instead consider the likelihood of such contact. They discuss existential factors that might limit the life span of radio communicating civilizations and thus reduce the probability of them overlapping with humanity's ability to communicate beyond earth:

1. "A technological civilization overexploits its natural resources, or pollutes its environment to an excessive extent"
2. "A technological civilization develops weapons of mass destruction … or is killed off through uncontrollable pestilence and disease"
3. "The reoccurrence of natural disasters that produce the evolutionary niche for intelligent species to emerge (believed to be an asteroid collision in the case of the demise of the dinosaurs, opening up the evolutionary path for humans on earth) could close off that niche."



Cover of Aliens: *Can We Make Contact With Extraterrestrial Intelligence* (From International, 1999). *[Balliol Library 1 g 62]*



"Gog," I said, "what about Mars? The ancient stories on Earth say that Mars was god of war, and Venus was goddess of love. Is there war on Mars?"

"Long ago there was war," said Gog. "There was war among the peoples of Mars, and there was war among the Sister Planets. But even before the Humans began to build cities on Earth, we had learned peace. The key was **mutual respect**, which some on Earth call **love**. Respect makes possible consultation, cooperation, harmony, and peace. Mars and Mercury and Venus have been at peace for thousands of years. Only Earth is still tormented by war, despite the brave examples of many wise women and men. I fear the **Humans may never learn peace**. Their lives are too short, they have too little time to understand. It takes time to learn that machismo is short-sighted and tragic."

Extract from *Bush Almighty! An Extraterrestrial Critique* by James Tyler (Published by the Author, 2004). *[Balliol Library 1 g 115]*

They speculate that these dangers facing humans might also threaten ETI but retain a hopefulness that "any long-lived ETI have solved the problems of sustainable development", and that technology might act "as a filter, allowing only those civilizations that have developed wisdom as well as intelligence to progress to a long-term future." This human hope that aliens might have something to teach us is picked up in elsewhere in Jarral's documentary when she interviews journalist David Clarke. He suggests that aliens are a contemporary manifestation of a perennial human wish for celestial others. This would make them a new iteration of angels or fairies. He sees in this a longing for confirmation that we are not the only intelligent life out there, because, if we are, this puts a huge responsibility on us to look after ourselves and our planet.[x]

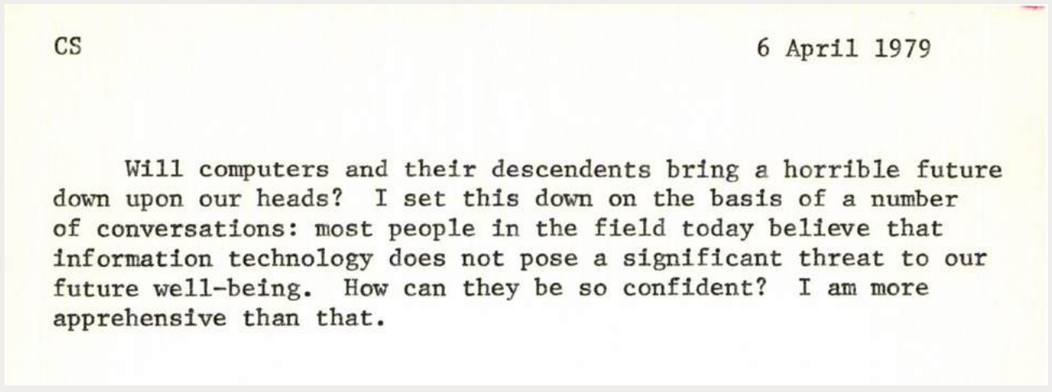
In *Bush Almighty! An Extraterrestrial critique* by James Tyler (Balliol 1962) Beth, a Terran journalist, calls on her friend Gog the Martian to help her decide how worried to be about the presidency of George W. Bush. Martians are long-lived – Gog is 600 - and have transcended war by learning "mutual respect, which some on Earth call love", so Gog is well placed to give perspective on the political situation on Earth. In Tyler's Terran-Martian dialogue aliens are not the threat. That comes from the machismo and posturing of world leaders.

In concluding "First Contact", Jarral reflects on the role aliens play for humans: "Does it really matter whether they're actually out there or just technological angels in our imaginations? I don't think it does. Because ultimately thinking about meeting aliens is a richly creative way to reflect on how we live on this planet, our only home".

VISION 6: COMPUTER DOOM

Concerns about the possibility of Humans being out-thought or even replaced by artificial intelligence (AI) are not new. The earliest references to "thinking machines" appeared in an issue of the New York Times in 1927 and the concept of the "Imitation Game"— a test of a machine's ability to exhibit intelligent behaviour equivalent to that of a human — was introduced by Alan Turing in 1949. AI and its relationship to humanity is a common theme in the science fiction of the 20th-21st centuries. These portrayals are not always negative, but the potential threat posed by a malevolent artificial intelligence is a very familiar trope and famous Hollywood portrayals range from *2001: a Space Odyssey* to *The Terminator* and *The Matrix*.

Nick Trefethen (Balliol Emeritus Fellow) often comments on the issue in his index cards, a collection of notes on a wide variety of subjects, ranging from mathematics to philosophy to observations about day-to-day life, which he has been recording since 1970. Trefethen has deposited the complete collection of his index cards at Balliol College. Here you can see in a card in which Trefethen expresses his concerns about the potential dangers of AI.

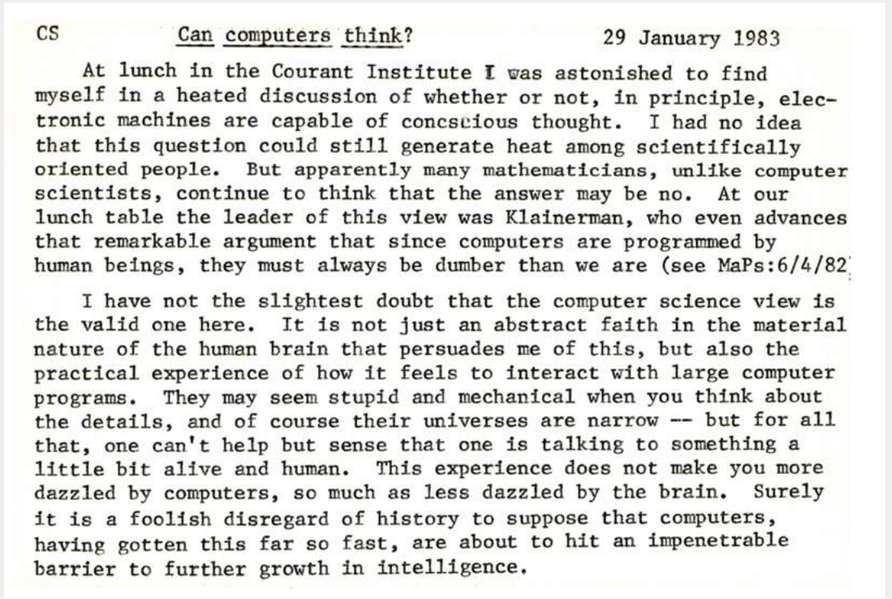


CS 6 April 1979

Will computers and their descendents bring a horrible future down upon our heads? I set this down on the basis of a number of conversations: most people in the field today believe that information technology does not pose a significant threat to our future well-being. How can they be so confident? I am more apprehensive than that.

Index card: Computer doom. *[BCHC/PP/TREF/10/8]*

You can also see this card in which Trefethen speculates on the likelihood of human intelligence being surpassed by that of AI.



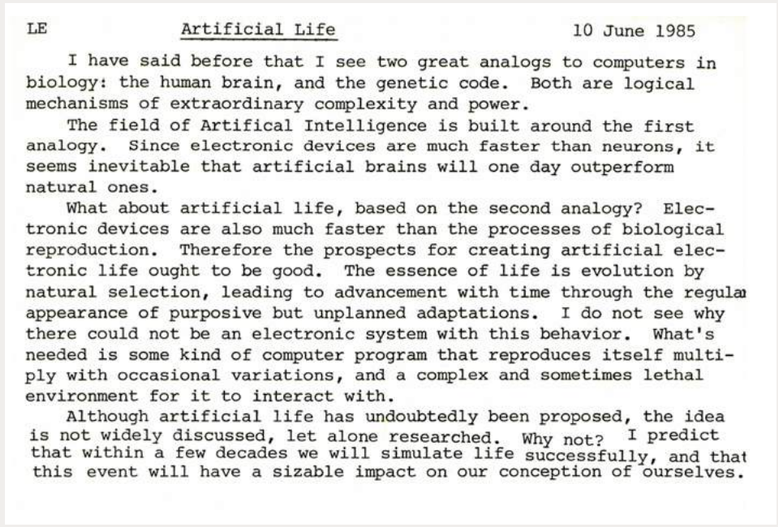
CS Can computers think? 29 January 1983

At lunch in the Courant Institute I was astonished to find myself in a heated discussion of whether or not, in principle, electronic machines are capable of conscious thought. I had no idea that this question could still generate heat among scientifically oriented people. But apparently many mathematicians, unlike computer scientists, continue to think that the answer may be no. At our lunch table the leader of this view was Klainerman, who even advances that remarkable argument that since computers are programmed by human beings, they must always be dumber than we are (see MaPs:6/4/82)

I have not the slightest doubt that the computer science view is the valid one here. It is not just an abstract faith in the material nature of the human brain that persuades me of this, but also the practical experience of how it feels to interact with large computer programs. They may seem stupid and mechanical when you think about the details, and of course their universes are narrow -- but for all that, one can't help but sense that one is talking to something a little bit alive and human. This experience does not make you more dazzled by computers, so much as less dazzled by the brain. Surely it is a foolish disregard of history to suppose that computers, having gotten this far so fast, are about to hit an impenetrable barrier to further growth in intelligence.

Index card: Can computers think? *[BCHC/PP/TREF/14/3]*

In a third index card, Trefethen speculates not only that "artificial brains will one day outperform natural ones" but also that it may be possible in the future to create an electronic system that simulates life itself, complete with evolution by natural selection.



LE Artificial Life 10 June 1985

I have said before that I see two great analogs to computers in biology: the human brain, and the genetic code. Both are logical mechanisms of extraordinary complexity and power.

The field of Artifical Intelligence is built around the first analogy. Since electronic devices are much faster than neurons, it seems inevitable that artificial brains will one day outperform natural ones.

What about artificial life, based on the second analogy? Electronic devices are also much faster than the processes of biological reproduction. Therefore the prospects for creating artificial electronic life ought to be good. The essence of life is evolution by natural selection, leading to advancement with time through the regular appearance of purposive but unplanned adaptations. I do not see why there could not be an electronic system with this behavior. What's needed is some kind of computer program that reproduces itself multiply with occasional variations, and a complex and sometimes lethal environment for it to interact with.

Although artificial life has undoubtedly been proposed, the idea is not widely discussed, let alone researched. Why not? I predict that within a few decades we will simulate life successfully, and that this event will have a sizable impact on our conception of ourselves.

Index card: Artificial Life. *[BCHC/PP/TREF/16/20]*

In the 2020s, the possible dangers posed by AI have become a much more mainstream concern and regularly attract attention in the media. In particular, an ongoing debate has arisen about whether or not an 'unaligned' or 'misaligned' AI (an AI system which pursues unintended objectives) could genuinely pose an existential threat to humanity in the near future. This debate is being fuelled by the rapid advancement of technology and the increasing likelihood of the development of an 'artificial general intelligence' (AGI) functioning at or beyond a human level of intelligence. A 2022 survey of AI researchers found that 90% of respondents expected AGI would be achieved in the next 100 years, with 50% expecting it to arrive by 2061.

On 22 March 2023, more than 1,000 tech leaders, researchers and others signed an open letter urging a moratorium on the development of the most powerful artificial intelligence systems, citing "Profound risks to society". Shortly after this on 29 March 2023, artificial intelligence researcher Eliezer Yudkowsky published an op-ed in *Time* magazine, arguing that this open letter did not go far enough and advocating a total, global halt on the development of AI.

You can see one side of this debate in *The Precipice: Existential Risk and the Future of Humanity, Toby Ord* (Balliol 2003). In this book, Ord argues that AGI poses a potentially existential risk to humanity. Ord claims that it would not be possible to impart an AGI with truly human values as there is too much complicated variance of opinion amongst humans to produce anything other than a flawed copy of a human system of morality. Upon realising the misalignment of its goals or values with those of humanity, an AGI would engage in deception or even attempt to seize control in order to fulfil its goals. An AGI with access to the internet would be very difficult to destroy as it could create copies of itself on insecure systems.

Ord estimates the existential risk associated with unaligned artificial general intelligence to be 1 in 10 over the next century, higher than all other sources of existential risk combined. Other sources of existential risk Ord considers are nuclear war, climate change or an engineered pandemic.

You can see the other side of the argument in a guest contribution to the exhibition catalogue by another Balliol author: John Tasioulas (Balliol 1996). In it, Tasioulas presents the argument that "existential risk is seriously over-hyped relative to the other, more concrete and imminent, challenges posed by AI".

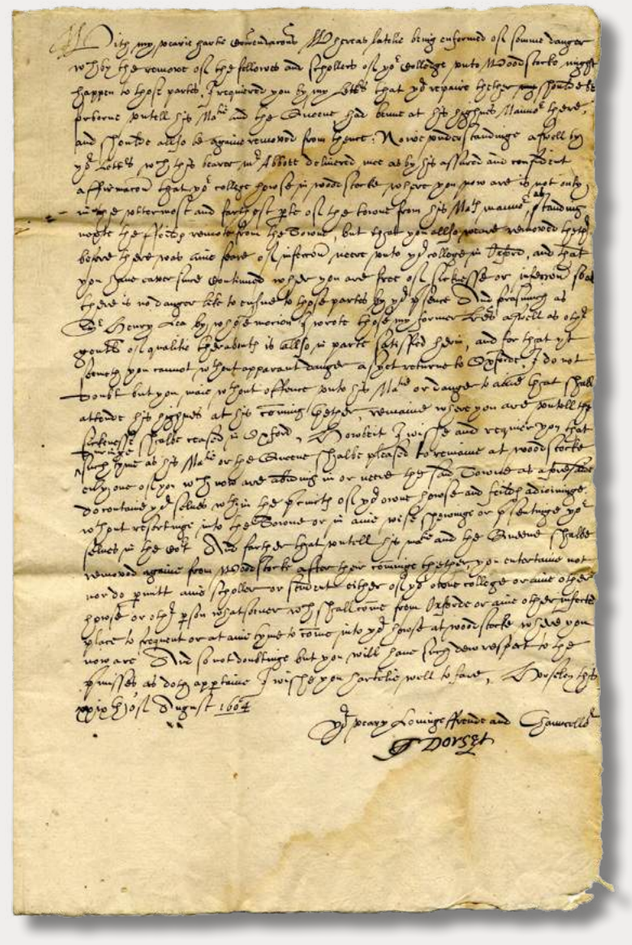
VISION 7: PANDEMIC

Pandemics are powerful agents of change and disruption, which challenge the structures of society, overwhelming governmental systems, and transforming cultures. From ancient plagues to the COVID-19 pandemic, history offers plenty of lessons about the fragility of civilization in the face of disease.

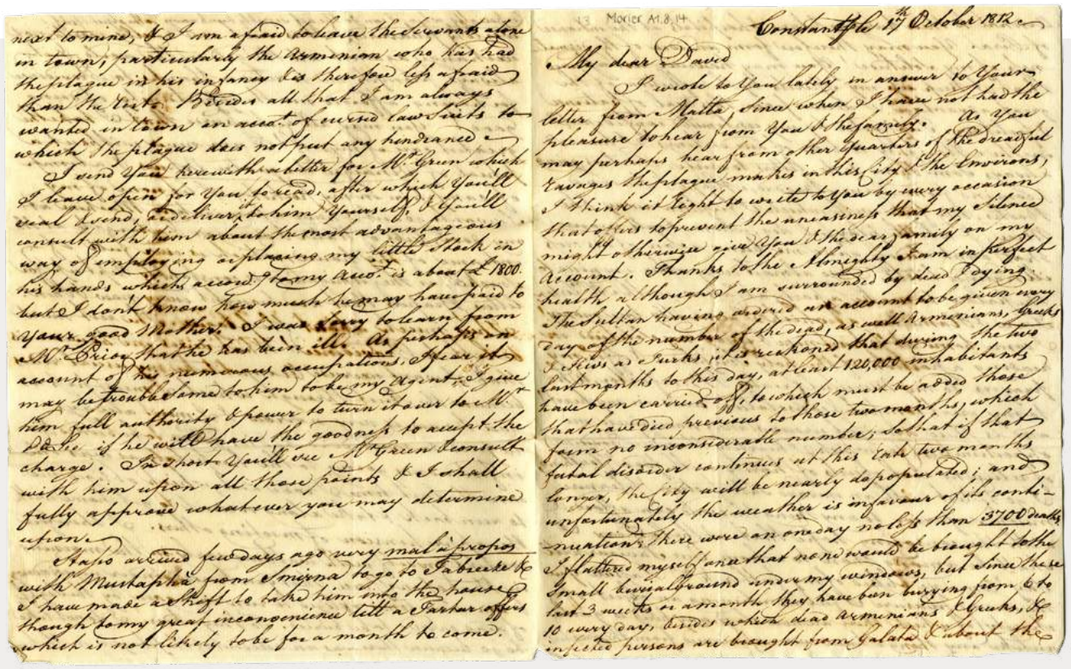
Mass mortality is the most immediate threat posed by a pandemic. Diseases can spread rapidly and widely, decimating populations, and leading to the breakdown of critical systems, such as food production, healthcare, and the logistical networks that support contemporary urban life.

The Black Death (1347–1351) killed an estimated 30–60% of Europe's population. The demographic shock weakened the feudal system, as labourers became scarce, and peasants demanded better conditions. If a similar mortality rate were seen in a modern, hyperconnected world, the effects would be exponentially magnified and devastating. Urban centres, which rely heavily on complex, just-in-time supply chains could collapse rapidly, triggering secondary crises such as starvation, lack of clean water, and civil unrest.

Pandemics also give rise to fear and misinformation, providing fertile ground for conspiracy theories, populism, and social fragmentation. The COVID-19 pandemic highlighted how disease can produce social unrest, politicisation of public health, and deepening divisions within and



Social distancing in Woodstock: Letter from Thomas Sackville to Balliol College, 1604. *[BCHC/Formal Archives. F.9.7.]*



Self-isolation in Constantinople: Letter from Isaac Morier, 17 October 1812. *[BCHC/Morier Family A1.8.14.]*

between countries. The pandemic exposed profound weaknesses in global coordination, public health infrastructure, and equitable distribution of resources. In addition to this a pandemic also disrupts rituals, education, and communal life, which has long term effects.

In the 21st century, we face a paradox: we have never been more technologically equipped to combat disease, yet we have also never been more globally interconnected, ecologically strained, and politically fractured. The question is not whether a pandemic can bring about the apocalypse, but whether we are wise enough to coordinate our efforts and prevent one from doing so.

The Covid-19 pandemic was not the first time Balliol had to adapt to different ways of living and working in times of contagion. Plague, pestilence or sickness disrupted College life several times in the 16th and 17th centuries. The College fled to rural locations four times, leaving behind only a skeleton staff.

In 1603-4, when plague spread rapidly from London to Oxford, Balliol found refuge around Woodstock as had the King and Queen, James I and Anne of Denmark, who had moved into Woodstock Palace. The Viceregent and Fellows received the letter pictured on the previous page from Thomas Sackville, Earl of Dorset, Chancellor of Oxford University and Lord High Treasurer. Dorset warned College members to "shelter in place" in their house at the opposite end of town from the royal manor and forbade any Balliol students remaining in Oxford to travel to Woodstock.

Plague epidemics were frequent in the Ottoman Empire between the 16th and 19th centuries, with the 1812-19 plague killing around 300, 000 people.[xi] This outbreak began in July 1812 in Constantinople and eventually spread beyond the borders of the Empire. Another epidemic followed between 1835 and 1838.

One person who experienced this, and may have fallen victim to it, was Isaac Morier (1750-1817). A merchant from Switzerland, he moved to Smyrna, first to find work with his uncle, and then with the business of David Van Lennep, the Dutch consul, as a clerk. He became a British subject a year later, joining the British Levant Company, and in 1778 married the consul's eldest daughter Clara. In 1787 the family moved to England where they became close friends of their cousins, the Waldegraves. William Waldegrave helped to settle Morier's debts when his business collapsed in 1803 and secured him a job as consul-general in Constantinople in 1804. Morier hoped to be able to afford to bring his wife and daughters out to join him, or to retire to Switzerland. Neither ambition was realized, and he died in Constantinople on 17 August 1817, either from cancer or the plague that was then raging, with no member of his family near him. In this letter he details his daily life living under the pandemic and the attendant daily restrictions:

"Thanks to the Almighty I am in perfect health although I am surrounded by dead and dying. The Sultan having ordered an account to be given every day of the number of the dead, as well Armenians, Greeks and Jews as Turks, it is reckoned that during the two last months to this day, at least 120,000 inhabitants have been carried off, to which must be added those that have died previous to those two months, which form no inconsiderable number; so that if that fatal disorder continues at this rate two months longer, the city will be nearly depopulated; … there were one day no less than 3700 deaths. I flattered myself once that none would be brought to the small burial ground under my windows, but since these last three weeks […] they have been burying from 6 to 10 every day […] you may therefore form an idea of the dismalness of my solitude! You may however rest assured that I keep up my spirits by the reflection of the great advantage I derive from this trial of patience and fortitude, supported by my unlimited confidences in the Almighty […] I have always something to do; letters to write; […] my fiddle[?] with which I frighten away the mice; and a little playful dog, whom I call mouse."

The similarities between Morier's experience and that of living through the recent pandemic are striking. In 2020 the virus escalated into a major crisis quickly and suddenly, with drastic and serious restrictions in place, such as the closure of schools and a work from home order, and each day the UK Government gave a briefing outlining the daily cases of the virus and provided updates on the pandemic and the measures in place.

The recent lockdowns caused a prolonged hiatus to normal college life, leading to both short- and long-term consequences of social isolation that we will struggle to understand for years to come. The image right shows the Hall set up with screens between each diner.



Photograph of Balliol College Hall in 2020 by Kate Bailey.

This recent example of an almost apocalypse provides us with a useful test case of how we tend to behave. The first case appeared in the UK on 31 January, by which time the immanence of the pandemic was clear, but by 12 March community testing and tracing were abandoned, and planning focused on dealing with the impact, rather than preventing the virus. This meant that we accepted a high level of fatality even before Covid arrived in the UK.

Quarantine measures were thought too extreme, so there wasn't a coherent strategy for their use. This lack of preparation existed despite the World Health Organization recommending that countries plan for a coronavirus outbreak in 2017 and 2018. In the report by the UK Covid-19 Inquiry, chaired by the Rt Hon Baroness Heather Hallett DBE, they found that there were lessons available from previous outbreaks of SARS-CoV-1 and Middle East respiratory syndrome, specifically around the effectiveness of isolation and tracing, that were not taken on board. Hallett went on to say that there were "major flaws, which were there for everyone to see" and the strategy was that the government "proceeded on the basis that the outcome was inevitable."

IN THE END

The major lesson from each of the apocalyptic scenarios featured in this exhibition is that we must coordinate, adapt, and act in advance of threats. We should not unthinkingly accept worst-case scenarios as inevitable. If we cannot always realize our dreams, we should not simply submit to our nightmares.

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REASONS TO BE CHEERFUL: VISIONS FROM BALLIOL ALUMNI

Informed optimism and collective action – antidotes to the apocalypse

Gill Einhorn (Balliol 2007)

Head, 1t.org, World Economic Forum; Co-Founder, Open Planet

Today, we have many reasons to feel apocalyptic. Rising populism, increasing trade tensions, the threat and reality of war, growing economic and social instability, and an increasingly toxic information ecosystem of disinformation are looming. They seed doubt and fuel fear. They are also symptoms of a much larger crisis.

Earth – our home – has a temperature. Since January 2024, we have been living in a 1.5 degree world. Climate hazards from droughts to floods and fires are being unleashed with greater frequency and severity, and there is more to come, as Earth systems tip into unstable states that cascade climate risks. Five important natural thresholds, or Earth system tipping points already risk being crossed, according to the most recently released Global Tipping Points report, and three more may be reached in the 2030s if the world remains 1.5°C above pre-industrial temperatures – which looks increasingly likely. Indeed, six of our nine planetary boundaries have been transgressed, and our window of action to maintain a safe and just pathway is vanishingly small.

Are you on the verge of tearing your eyes from the page, and entering a downward spiral of dismal despair? That's a natural response. When faced with the apocalypse, the human brain goes into fight-flight-freeze-fold mode – a trauma response designed to keep us safe. Unfortunately, this also leads to inaction – quite the opposite of what's needed at this critical juncture. Overcoming our biology is no easy feat, but there is hope.



Credit: Betje

When confronted with an existential threat, it is essential to understand the reality we are facing. Not doing so, leads us to a misguided perception of the problem and so poorly crafted, short-term and often linear solutions. On the other hand, maintaining a fixed focus on the threat also induces inaction – propelling rather than mitigating risk.

In the words of James Stockdale, who faced his own existential crisis in a prisoner of war camp in Vietnam: "You must never confuse faith that you will prevail in the end — which you can never afford to lose — with the discipline to confront the most brutal facts of your current reality, whatever they might be."

He observed that those prisoners who were too optimistic without understanding their reality died because they got discouraged. So did those caught in a trauma response of despair. The small group of prisoners who survived managed to pair a fully informed perspective with unconditional optimism – also known as 'informed optimism'.

We are both the species that caused the climate crisis and we are uniquely positioned to respond to avert its worst consequences. The future of life on our planet is in our hands, and the way our current generation reacts will determine the nature of life following this mass extinction event. Informing our best possible response is one of the biggest challenges and opportunities of our time. It is also our responsibility.

Humanity's collective, coordinated and credible responses, also known as 'collective action' is a necessary condition to safeguard lives and livelihoods. This requires leadership both from global decision makers, like those I work with at the World Economic Forum, alongside cutting edge-research from academic institutions like Oxford. It also requires mindset shifts and different choices from each and every one of us. Many opportunities exist. For instance, mindful consumption, circular and low-emissions living, sustainable wealth management, regular exercise, eco-friendly career choices, nature investments and resilient mental models that focus on possibility rather than loss – to name but a few.

Choosing an adaptive and appropriate response to the apocalypse involves thinking beyond ourselves to the legacies we wish to leave, and the choices we make today that will affect our children's children. It involves asking how our contribution could be more than the sum of individual parts, building new collective thinking into old models, and making hard choices to say goodbye to strategies that belong in the graveyard of human experience.

What would it take to become an informed optimist? We each hold the keys to that answer – what we need is to turn our ideas into tangible actions informed by hard realities, yet not overcome by them. A tidal wave is made of many small drops.

On the fear of an AI apocalypse

Professor John Tasioulas (Balliol 1989) Director, Institute for Ethics in AI and Professor Josiah Ober

"What about the fear of existential risk that drives much of the 'safety' discourse in AI circles, isn't the magnitude of this threat something that justifies prioritising safety as the framing for AI regulation? One version of this worry concerns the use of AI by malign actors, such as authoritarian governments or terrorist organisations, and this clearly is a serious threat. But often it takes the form of AI systems themselves autonomously posing an existential threat quite independently of any evil intent on the part of humans involved. To be clear, we do not contend that we should totally discount the worry that AI might spiral out of control and annihilate humanity, either through some eccentric attempt to pursue seemingly innocuous goals we have given it or else in pursuit of its self-given goals. But this scenario not only rests on a series of contestable empirical assumptions, regarding how AI technology is likely to evolve and on what time-scale. It also rests on contestable conceptual assumptions about the very idea of Artificial General Intelligence. For example, is it realistic to suppose that true AGI – an AI system that was genuinely capable of replicating human cognitive functioning across its entire range of operation – would be so utterly morally obtuse as to annihilate all human beings in order to fulfil an instruction to produce paper clips?

More importantly, perhaps, the weight given to the existential risk threat often depends on highly contestable ethical assumptions. To begin with, talk of existential risk is often elaborated within a utilitarian framework that reduces morality to the imperative to maximise overall welfare. But, as we have seen, this is a deeply problematic theory, not least due to its propensity to sacrifice the vital interests and rights of individuals on the altar of a supposed common good. Moreover, 'long-termist' proponents of existential risk make the further, deeply questionable assumption that in the process of utilitarian calculation, the lives of countless future people who might exist thousands of years hence are to be given equal weight to those of actually existing human beings in the here and now.

Another aspect of the discourse of existential risk is that it conceives of the emergence of AGI as the creation of a powerful set of tools in order to advance human purposes. But, especially if we correct for the unduly restrictive conception of 'intelligence' that is at play here, and consider what sort of beings really could replicate human cognitive functioning across its entire range, then it is highly likely that the beings in question would possess an intrinsic moral status, and perhaps be the bearers of rights. To this extent, to construe the problem raised by AGI as one of 'control', and the

'alignment' of 'instruments' or 'tools' with human purposes, seems deeply morally ill-judged, as if the issue were one of creating a new race of slaves.

The overall conclusion is that while it cannot be dismissed, the worry about existential risk is seriously over-hyped relative to the other, more concrete and imminent, challenges posed by AI, such as the way it perpetuates and deepens existing injustices, its potentially devastating impact on democracy, work opportunities, and the prospects for living in a world characterised by meaningful forms of human interaction."

Extracted from THE LYCEUM PROJECT: AI ETHICS WITH ARISTOTLE by Josiah Ober and John Tasioulas (June 17, 2024). Available at SSRN: https://ssrn.com/abstract=4879572

An (anti-apocalyptic) AI Thought Experiment

James Manyika

(Balliol 1992) Senior Vice President at Google-Alphabet.

The first thing I ever published was a paper titled "Modelling and Training of Artificial Neural Networks" that was based on my undergraduate thesis at the University of Zimbabwe. By the time it came out in the African Journal of Science and Technology in 1991, my interest in AI and Robotics had already brought me to Oxford and eventually Balliol College for a DPhil and as a Junior Research Fellow. Back then apocalyptic views on AI were the stuff of science fiction – given the field was not understood widely to be making much progress. But that began to change in the 2000s – especially since 2017 with introduction of the Transformer by Google researchers in the now famous paper "Attention is all you need" which heralded the era of large language models (LLMs) – and as the field began to make significant and widely visible and accelerating progress, raising both excitement about the beneficial possibilities of AI as well as concerns.

Since that time I've been exploring the question of getting AI right with many at the frontier of AI's advance and others at the fore-front of its potential impact on society. This took on more focus around 2019 through various initiatives[1] including when the American Academy of Arts and Sciences invited me to conceive and guest-edit a special volume of Daedalus (the Academy's journal) that would be focused on AI and Society. The work to complete the Daedalus volume brought me back to Oxford in 2021 as a Visiting Fellow at All Souls and with time spent at Balliol, the Blavatnik School of Government and the, new at the time, Institute for Ethics in AI.

Several years ago, I had come to articulate the question of getting AI right as the following thought experiment:

"It's the year 2050, AI has turned out to be hugely beneficial to society and generally acknowledged as such. What happened?"

The thought experiment aims to elicit the most worthwhile possibilities we will have achieved, the most beneficial opportunities realized, the hard problems solved, the risks averted, misuses avoided, unintended consequences mitigated if we are to acknowledge a positive – and anti-apocalyptic – outcome in 2050. It is a way of asking what we need to get right if AI is to be a net benefit to society in a not-too-distant future.

Several important areas have stood out to me as critical areas to solve for in this thought experiment, these include: (1) Addressing AI's current limitations and developing more capable, safer, trustworthy and less resource intensive AI, (2) Harnessing and realizing AI's potential to benefit and advance humanity, (3) the Responsible development, deployment, use of AI and its governance, (3) the Co-evolution of societal systems and what it means to be human in the age of AI, including what could be gained and lost, and (5) solving for Alignment with increasingly powerful and capable AI – areas all of which are huge categories in their own right with many subissues and complexities.[2] For the remainder of this essay, I'll focus on just one of these five areas: harnessing and realizing AI's potential to benefit and advance humanity – in other words, the possibilities and challenges to deliver on what excites and motivates many of us about AI.

AI has the potential to benefit humanity by assisting individuals, powering the economy, advancing science and helping address societal challenges and improving lives everywhere. And so on this, the question in 2050 will be to what extent these possibilities will have been realized and the benefits broadly shared. There are at least three sorts of opportunities and challenges:

First, the potential for AI to assist individuals from their everyday tasks to their most ambitious endeavors and to overcome knowledge and informational barriers such as language, and the potential for AI to drive economic gains and prosperity underlie much of the excitement and investment in AI. AI is proving to be applicable in a growing and wide spectrum of activities undertaken by individuals, small and large organizations in multiple domains and sectors. AI's use is also expected to lead to a cascade of complementary innovations and technology spillovers. With these general purpose technology attributes, AI could drive innovation and productivity for individuals, businesses and organizations in sectors as diverse as retail, manufacturing and operations, healthcare and the public sector, in developed and developing economies.[3] Productivity growth matters because over time it has been crucial for raising wages and purchasing power of consumers, increasing demand for goods and services, and improving living standards. Productivity will become even more important as populations age and countries and regions seek to leap forward in their development. Many estimate AI's potential to boost productivity to be significant and transformational, and empirical studies, albeit very early and limited, seem to suggest the same. But while productivity has been the bedrock of long-term prosperity, in recent decades it has been sluggish in many countries and has not always been accompanied by levels of wage growth experienced in prior decades. This would need to change if AI-enabled productivity is to benefit workers.

To be clear, the productivity and economic gains from AI will not be automatic nor are they guaranteed. They will require broad adoption within and across sectors, application in productivity-enhancing uses, AI that makes workers more productive and ushers in new economic activities at scale. They will also require investment and capital deepening, co-innovations, process and organizational changes, workforce readiness and enabling policies. In other words, the extent of the gains will depend on choices we collectively make. Furthermore, for AI to have been beneficial when we look back in 2050 will also depend on whether it is improving the economic well-being of people and with gains broadly shared. This matters because, despite economic growth over the last few decades, inequality has grown. AI should not make this worse, but should help broaden prosperity - this won't happen by itself.

On most people's minds is AI's impact on work – understandably, since most derive their livelihood through work. Many fear that AI will lead to technological unemployment, a concern with a long history (and a term attributed to Keynes in the 1930s). Historically, technology has not led to economy-wide job displacement, despite significant shifts between sectors, from agriculture to manufacturing to services, and shifts in occupations with some declining and others growing. Therefore as similar shifts occur with AI, it will matter that with AI people can sustain their livelihoods. This should be possible if: AI is used to assist workers more than displace them; worker skills co-evolve with AI capabilities; assistive use of AI does not wholescale depress wages, but ideally grows them as workers become more productive; and in cases where workers are displaced, they are able to find opportunities in growing and/or new occupations and sectors - these ifs will need to be turned into reality. It is worth noting that recent research, including by the International Labor Organization, suggests that in the foreseeable future, AI will likely be several times more worker-assistive than worker-displacing.[4]

Second, AI has another potentially distinctive attribute – one that also motivates many AI researchers – the potential to be an invention for inventing and for solving complex problems in domains important for humanity's progress. Science is one such domain where AI has begun to

enable progress and landmark advances.[5] The example of Google's AlphaFold – for which my colleagues Demis Hassabis and John Jumper won a Nobel Prize in 2024 – is instructive for its ambitions and possibilities for impact: AlphaFold solved the 50-year grand challenge of protein-folding, predicting the structure of 200 million proteins; its open-access database of protein structures is being used at time of writing by over 2.8 million scientists in over 190 countries, many working on neglected diseases and more; a year later, AlphaFold3 extended to life's other biomolecules, DNA, RNA and ligands.[6] Other notable AI-assisted advances range from genomics, neuroscience, material science, earth and climate sciences, to physics and astrophysics and more.[7] As an invention for invention, AI could help bend the curve on R&D productivity. It's early days, but more AI-enabled advances in science are becoming possible as AI becomes more capable and there are co-investments and innovations in science itself.

Furthermore, still more capable AI may be needed for further breakthroughs. This may require AI capable of generating novel scientific conjectures and theories, proposing and steering experiments, perceiving the world in novel ways including and beyond our sensory and cognitive limits, solving problems that require other kinds of intelligence in addition to ours.

Third, if in 2050 we are to respond affirmatively it will also be because we will have applied AI to significant beneficial effect on major societal challenges such as the Sustainable Development Goals (SDGs). These 17 goals, adopted by UN member states in 2016, can be understood as an expression of what the world agrees are humanity's greatest challenges and a shared vision for human flourishing. They include ending poverty and hunger, increasing health and well-being, expanding access to education, reducing gender and other inequalities, climate action and sustainability – goals the world is currently not on track to achieve. There is promising, but early, progress in using AI to help advance the SDGs.[8] It's worth noting that many such AI-enabled beneficial uses are not always understood as such, examples include: use of AI-enabled tools by over a billion people to access information across language and other barriers, wildfire prediction, flood forecasting covering hundreds of millions in over 100 countries, tools for medical diagnosis in developed and developing countries, developments in vaccines and more. Still, more is required for AI's contributions to have made a difference when we look back in 2050. Making a difference should also include avoiding what the UN High-Level Body on AI called "missed" uses, where not using AI could lead to worsening of societal challenges, especially in contexts where alternatives are limited or simply unavailable.[9] This will require that we make material progress in addressing capacity and capability gaps (within and between countries, especially for those in the Global South) that could hinder broad participation in the development, use and societal benefits of AI.

The opportunities and challenges presented in the preceding paragraphs are just some of those in just one of the 5 categories I stated at the outset (I have discussed the other categories elsewhere). Readers will undoubtedly have their own views of what we must get right if AI is to have been a net positive for humanity when we look back in 2050. However the work to get AI right must not wait. It must be taken on now with a focus on not just what could go wrong, but also what could go right and how we shape it in the face of some unknowns. It is work that must involve everyone – researchers, developers and users of AI, the private and public sector, academia, civil society and governments – we should get on with it.

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1 These include: The 100-Year Study of AI that I have been involved in publishes a report every five years; its last report took stock of progress in AI as well as concerns as it is more widely deployed in society. See "Gathering Strength, Gathering Storms: The One Hundred Year Study on Artificial Intelligence (AI100) 2021; Daedalus volume on AI & Society, Edited by James Manyika, May 2022, American Academy of Arts and Sciences; UN High-Level Advisory Body on AI (co-chair); Interim and Final Report: Governing AI for Humanity (United Nations, December 2023, September 2024). 2 This article is excerpted from a longer essay in which all 5 areas are discussed: James Manyika,"Getting AI Right: A 2050 Thought Experiment," Digitalist Papers, September 2024. 3 James Manyika and Michael Spence "The coming AI economic revolution: Can AI reverse the productivity slowdown", Foreign Affairs, Oct. 2023. 4 Pawel Gmyrek, Janine Berg, David Bescond, "Generative AI and Jobs: A global analysis of potential effects on job quantity and quality," International Labour Organization (2023) updated May 2025. 5 Wang, H., Fu, T., Du, Y. et al. Scientific discovery in the age of artificial intelligence. Nature 620, 47–60 (2023); "Science in the Age of AI", Royal Society, 2024. 6 Jumper, J., Evans, R., Pritzel, A. et al. "Highly accurate protein structure prediction with AlphaFold," Nature 596, 583–589 (2021); Abramson, J., Adler, J., Dunger, J. et al. "Accurate structure prediction of biomolecular interactions with AlphaFold 3," Nature 630, 493–500 (2024). 7 Alexander Shapson-Coe et al. "A petavoxel fragment of human cerebral cortex reconstructed at nanoscale resolution," Science 384, 2024; Liao, WW., Asri, M., Ebler, J. et al. "A draft human pangenome reference," Nature 617, 312–324 (2023); Merchant, A., Batzner, S., Schoenholz, S.S. et al. "Scaling deep learning for materials discovery," Nature 624, 80–85 (2023). 8 "UN activities on AI", 2023 Report of the UN Agencies; Brigitte Hoyer Gosselink, Kate Brandt, Marian Croak, et al., "AI in Action: Accelerating Progress Towards the Sustainable Development Goals," 2024. 9 UN High-Level Advisory Body on Artificial Intelligence, Interim Report: Governing AI for Humanity (United Nations, December 2023); Final Report (United Nations, September 2024).

A stunning double rainbow over Balliol College, Oxford by Charles West (Balliol 2021) June 2022.



