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The Western European Left and the First Moon Landing: The Fall of Scientific Enthusiasm and the Ebb of Socialism

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ABSTRACT

During the Cold War, the thinking of Western European social democrats and communists around science shifted from optimism about scientific progress as necessary to solve social problems to scepticism and concern for technological risks and unaccountable technocracy. The first moon landing offers a vantage point to analyse this transition, as it started a debate about science and crystallised hostility towards scientific funding through taxpayers' money. The reactions of the Western European Left towards Apollo were varied and can be classified into three categories: Big Science Socialism, which celebrated the positive feedback loop between science, state power and socialism; Earth-First Critique, which balanced celebration with reminding of urgent problems on Earth; Radical Anti-Scientism, to which Apollo epitomised imperialistic capitalism and the hegemony of materialistic scientism over humanism. The article examines three figures who approved the Apollo programme for helping collectivism (Tony Benn, Emilio Sereni, Karl Steinbuch) and three figures who condemned it (Marcello Cini, Nigel Calder, Robert Jungk). Beyond these extremes, the article examines the fourth, more nuanced position of the British Labour Party, the German Social Democrats (SPD) and the Italian Communist Party (PCI), which had to reinvent science policies beyond exhausted technocratic dreams and inflexible renunciation of technological modernity.

KEYWORDS

First moon landing; astroculture; British Labour Party; Italian Communist Party (PCI); Social Democratic Party of Germany (SPD)

Space, science and socialism

On 20 July 1969, Neil Armstrong and Buzz Aldrin from the Apollo 11 mission became the first men to land on the Moon. The event is highly significant for the history of technological development and space exploration. Equally important is its place in the bipolar confrontation among great powers, which found expression in the Space Race of the 1950s and 1960s.[1] However, this article does not deal with these aspects but focuses on a less known facet, the political ramifications of the first moon landing in Western Europe. Alexander Geppert explained that space enthusiasm had much to do with Earth: space and nuclear power were perceived as the epitome of modernity and tied to utopian or dystopian visions of progress.[2] The discourse about space was a discourse about the social role of science and technology, the goal of politics, the conditions for a good life in modernity. The concept of Astroculture offers a great contribution to building an intellectual history of the Western European left during the Cold War. This concept

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makes it possible to insert space history at the ground level of Cold War confrontation. Astroculture covers all the cultural products through which individual and collective actors attribute meaning to space. Multiple interpretations of astroculture competed in the public arena, as politicians and intellectuals attributed different values and significance to space exploration, deriving from their different assessment of the social role of science and the system in which scientific research was carried out.

This article analyses the ideas of the Western European left about science and technology and their long-term evolution by studying the debate around the first moon landing. This event serves as the perfect vantage point, because key progressive politicians and intellectuals produced extensive reflections on scientific and technological topics. For case study, the article selects the debate in and around three prominent left-wing parties in Western Europe: the British Labour Party, German Social Democracy (SPD) and the Italian Communist Party (PCI). This covers the most important social democratic and communist parties in the biggest countries of Western Europe — the French left was undergoing a painful transition and was distracted. The goal is to explore not science itself but what I call here the 'partisan visions of science' — how political actors conceive of science and its social role, how their ideological parameters shape their perception and how their vision of science reinforces ideological beliefs in turn.

Recent literature identifies the 1970s as a turning point in postwar history that still defines contemporary society and culture.[3] This decade was marked by the great vitality of social democrats and Eurocommunists (the Old Left), but also the emergence of global constraints to the nation state, the rise of the New Left and post-materialist social movements and the neo-liberal critique of statism. This article explores a less known trend: the change in attitude towards science and technology. My hypothesis is that faith in progress, science and technology was a pillar of the Old Left; as it went into crisis, it undermined social democratic and communist ideology.

The first moon landing offers an important milestone to analyse the evolution of the public perception of science and technology at the threshold of the 1970s. The event started important debates: it is rare to have so many politicians and intellectuals express explicitly their ideas about scientific research and technology. In addition, Geppert sees in the 1970s a nexus between space fatigue after the peak enthusiasm of Apollo and the new perception of limits and crisis. 'Continual progress, exponential growth and outward expansion – previously considered the basis of incessant improvement of the human condition by means of technoscience – went into reverse. Large-scale technology ceased to be the trustworthy engine of societal change and humankind's betterment proved itself a problem, if not indeed its very obstacle.'[4]

This new mood was less likely to favour social engineering and state action, thus damaging the Old Left. Enthusiasm about applying scientific and technological solutions to solve social problems was a distinguishing feature of the European left throughout the 1950s and early 1960s.[5] The most famous example was Harold Wilson's election campaign in 1964, which he ran around the theme of the 'white heat' of the technological revolution; however, it was not an isolated case.[6] Despite different political strategies and mutual hostility, communists and social democrats shared a strong pro-science attitude and commitment to High Modernism: belief in progress, economic growth, satisfaction of material needs and scientific mastery over nature and society.[7] The late 1960s saw the beginning of a paradigm shift in the attitude towards science and technology. Technocratic confidence gave way to greater awareness about risks — with the rise of the environmental and anti-nuclear movements — and the dehumanizing effect of technological society — with criticism by Marcuse. Scientific technocrats were criticised for making decisions outside democratic scrutiny — Ralph Lapp focused specifically on the Apollo Programme.[8] The new generation of thinkers and activists called scientism and technocracy what they saw as science's complicity with Western capitalism and imperialism in curbing freedom, democracy and human values. As Labour minister Tony Benn noted: 'The uncritical acceptance

of what may emerge from science — this process will be accelerated by the achievements of the astronauts — is beginning to give way to a more conscious desire to shape the future through the use of this power more than may have occurred at any previous time.'[9]

As this quote shows, politicians did not have a clear definition of science and its distinction from technology. For the most part, they saw science merely as the source of technological innovation. When talking about space exploration, Geppert finds the concept of 'technoscience' more useful, as it fuses pursuit of knowledge, practical aims and more political goals such as power and prestige.[10] I will try to disentangle when politicians dealt with science as a practical activity to produce new technological tools and thus increase instrumental power and the rare occasions when they recognised science as the independent pursuit of knowledge or as a critical method of thinking. Confusion on details was the rule, as all the people analysed here were politicians or intellectuals who spoke about science and technology without precision — even figures with a scientific background. Political history must assess the words these figures used about science not for their scientific content but their rhetorical and political character.

While the reactions to the first and subsequent moon landings mostly serve as a yardstick to measure the evolution of political culture, it also triggered protest against 'wasteful' science funding and misuse of taxpayers' money — opponents would rather spend the money on Earth. This opposition is well researched in the US context,[11] not so much in West Europe — Geppert even denies the existence of a European anti-space discourse.[12]

The reactions to the first moon landing exemplified the attitude towards science and technology at the time, which this article classifies into four categories I develop here. At one extreme, there is *Big Science Socialism*. Its supporters argued that the Apollo programme would serve progressive goals, creating technological spin-offs and the blueprints for large-scale projects. They insisted on the neutrality of science and technology: 'Technology, like all power, is neutral and the question is how do we use it.'[13] Humankind's mastery over nature could be misused, but science multiplied the tools for solving social problems. Benn saw 'scientific work as one aspect of the human and material power available to the community generally for whatever purposes seem most necessary.'[14] Accused by opponents of being technocrats, their conception was more in line with the traditional left-wing view of science.

At the other extreme, there was the attitude of *Radical Anti-Scientism*. Its supporters unreservedly condemned the Apollo programme for wasting money and manpower and for its military and propaganda character. This abomination was an indictment of how the system — capitalism but also Soviet communism — had irremediably corrupted society and science. Accused by opponents of being Luddites, their stance anticipated a new left-wing culture, more critical of scientism and technocracy and more aware of environmental risks.

The article will first explore the two extremes: three exponents each for Big Science Socialism and Radical Anti-Scientism. For these six figures the first moon landing was an opportunity to express their well-developed conception of science and technology and their role in society. Important politicians and intellectuals, including party leaders, made comments about space research and science in July 1969, but did not have a systematic view. Indeed, most politicians and intellectuals in the three parties fell under what I call *Earth-first Critique*. While expressing appreciation for the technological achievement and the heroic astronauts, these figures repeated that Earth had more urgent problems that deserved the money and qualified manpower. Unlike the two extremes above, this did not result in clearly constructed arguments, but a wide spectrum of positions, from celebration with reservations to more pronounced scepticism.

Finally, I will describe the attempts at a *New Synthesis*. The three parties tried to define a new attitude towards science, by moving beyond the technocratic elements of Big Science Socialism and answering demands of democratic participation and accountability but by still rejecting the impractical inflexibility of Radical Anti-Scientism.

Big science socialism: Benn, Sereni, Steinbuch

To describe the figures who were enthusiastic about the first moon landing I propose the label 'Big Science Socialism.' Big science refers not just to this period in history of science — marked by state and military involvement to pay the huge research expenses — but also the creator of the term, Alvin Weinberg.[15] Weinberg also invented the term 'technological fix' to describe technological solutions that circumvented social problems and were easier than political solutions. Weinberg believed that the state could leverage its huge involvement in scientific research — of which the Apollo programme was a model — to produce technological fixes. To critics, then and now, technological fixes favoured technocracy, excluded democratic choice and ignored social problems. However, the three figures I will analyse — Tony Benn, Emilio Sereni and Karl Steinbuch — believed that science could enhance democratic politics rather than reduce it.

Tony Benn was Minister of Technology in Wilson's government from 1966 to 1970 and the key figure in the Labour Left afterwards. Benn not only believed that technological progress had improved the life of ordinary people, but that there was a virtuous circle between technoscience and the modern state. The defining belief of Big Science Socialism was that only the interventionist state could provide the coordination and long-term funding modern science needed and only science could give the interventionist state the tools to achieve its goals. Benn found in Big Science the justification for going beyond the liberal minimal state and mere Keynesian redistribution and regulation.[16] Central in Big Science Socialism was the metaphor of mastery over nature: as science granted unlimited power to humans, they would no longer be slaves of circumstances. Benn's comment on the first moon landing — actually inspired by what astronaut Frank Borman told him[17] — is a perfect encapsulation of how High Modernist values were embedded in astroculture:

> For man has fashioned under the leadership of the National Aeronautics and Space Administration a system capable of co-ordinating and integrating the work of hundreds of thousands of people on a tight timetable in order to execute an objective, and mankind may need that instrument for other pressing problems. It reinforces my feeling that man, armed with scientific knowledge and engineering, can do almost anything that he wants to do and that he has removed the limitations on man's ability which have cramped his freedom since the beginning of time.[18]

In Benn's conception, science was both a source of technological innovation and a model of coordination involving thousands of people. This was reductive of science, but suited his interest in increasing productivity, which was a central concern for the British Left from the 1940s to the 1960s.[19] Benn saw in productivity the key to improve the balance of payments and the Pound — the main problems of the Wilson government since 1964. He was influenced by technonationalism,[20] the belief that technoscience was the source of prestige, power and economic growth for the nation: 'Our inventions are natural resources as much as North Sea Gas, coal or resources found under our land.'[21] He was also obsessed with decline, losing ground to the USA, West Germany and even Italy. Failing science policies had provoked decline, better ones could restore competitiveness, full employment and low inflation.[22]

His was an argument for the activist state. Given the scale of modern industrial development and the high risk of big research projects, only the state could carry the cost of keeping industries competitive in the international market. The state also had to pay for the higher quality of life, such as education, healthcare and protection from externalities like pollution and traffic, in addition to education for the jobs of the future and retraining the victims of technological unemployment.

For Benn the marriage of Big Science and Big State was uncontroversial and indeed confirmed by the convergence of the Western and Soviet bloc on a similar mixed economy.[23] Benn saw in the Apollo programme evidence that state intervention in the USA was actually bigger than in

Britain, dismissing neo-liberal arguments that lowering taxes and regulations would make investment flow naturally in the right industries:

> [The] most advanced science-based industries in the United States have had their progress paid for by the American tax-payer and Government. The seven billion dollar budget of the American Space Agency this year is not just a most expensive return ticket to the moon. It is the means by which the electronics industries—including computers, telecommunications, microelectronics, numerically-controlled machine tools firms and a number of others — have built up their present commanding position, done on enormous development contracts and production orders paid for by the Federal Government in Washington.[24]

However, by 1969 Benn was aware that pure research would not naturally increase growth.[25] His Ministry of Technology was concerned exclusively with applied research: solving problems and increasing the GDP, not winning Nobel Prizes — indirectly drawing a distinction between expansion of scientific knowledge and technological progress.[26] For Benn, indirect industrial subsidies like Apollo were not optimal for a small state. Instead, he favoured direct state intervention in all civil industries — indeed, for the first time Britain spent more on civilian than military research.

Likewise, Benn was aware of the drawbacks of technoscience but rejected a general critique of industrial civilisation and scientism.[27] The return to pastoral life was no solution; only technology could solve the problems of technological change.[28] Technological discontents were rightly challenging 'unthinking acceptance of everything that is scientifically exciting and technically within our capability; regardless of its social consequences.'[29] However, the problem was not technology itself but that business and government made decisions concerning technology without assessing their social impact or consulting citizens. Just like political or economic power, technological power needed democratic control. Benn admitted that 'some'[30] of the money spent in space could have been used to improve the quality of life and that 'people are not prepared to see science handled separately and divorced from areas thought appropriate for public discussion, funded unquestioningly, shrouded in mystery and decided by self-appointed leaders.'[31] However, his solution to the alienation of citizens from scientific research was more technology and more democracy: identifying social problems and using technology to solve them.[32] Even here the NASA offered the model of experts combining specialised knowledge with a rounded humanist worldview.

In Italy, communist Emilio Sereni employed a different conceptual toolbox to come to similar conclusions. In the late 1940s, Sereni was responsible for the PCI's cultural strategy.[33] He championed Lysenkoism as a proletarian science serving social goals: 'a science of men for men, that consciously sets the task to increase and perfect the dominance of man over nature through a deeper knowledge of nature itself and its laws.'[34] By 1969 Lysenkoism had been covered up, but Sereni still valued mastery over nature. He wrote the editorial for *L'Unità* — the PCI's newspaper —, celebrating the first moon landing as an example of the scientific-technological revolution that opened 'practically unlimited possibilities — in a quantitative and qualitative sense — not just for increasing knowledge, but also the power of humankind.'[35] Sereni understood the difference between science as expansion of knowledge and its technological application. However, he found no contrast between expensive space research and the war against misery, because the former built tools to solve the latter.

Sereni's comment were not extemporaneous, but they were part of his Marxist interpretation — based on the recently published *Grundrisse der Kritik der politischen Ökonomie* and the debates started in East Germany and Czechoslovakia around Marx's unfinished work. Starting from the distinction between 'productive forces' and 'relations of production,' Marx argued that capitalism turned knowledge into a 'direct productive force' (*unmittelbaren Produktivkraft*) in the form of machineries, increasing the share of fixed capital in production.[36] This framework identified science with the production of technology. According to Sereni, this development had become prevalent only in recent years with nuclear power, automation and space technology.[37] This meant that within productive forces, human labour played a subaltern role to scientific

labour (technology). Using bourgeois economics — the Human Capital Theory of Theodore Schultz and the work of Odd Aukrust —, Sereni showed that more than half increase in GDP was dependent on investments in human capital, particularly education and research. Thus, scientific workers and students had the same role as industrial workers: as science augmented productive forces, their dialectical struggle with the antiquated relations of production intensified, to the point that advanced productive forces could no longer develop under backward relations of production, making revolution necessary. Sereni still rejected the convergence theory, but he argued that the worldwide student movement was a product of similar expansions of technoscience, since scientific education prepared the students to reject the system they received, making them natural players in the revolutionary breakthrough. Thus, Sereni understood that one side of technoscience was increasing the power through technological innovation, the other side of the coin was its promotion of critical thinking, with important political repercussions for those holding power.

In West Germany, the clearest example of Big Science Socialism was Karl Steinbuch. He was a pioneer of informatics — he invented the word —, but also an influential public intellectual on the relationship of technology and politics and Futorology.[38] In the 1970s, Steinbuch turned to the Christian Democrats (CDU) and the New Right, but, according to Guhl, his political ideas were still progressive in 1969.[39] In 1968 and 1970 he published two books — *Falsch programmiert* and *Program 2000* — around the need to make European economy and culture more future-oriented to close the gap with the USA,.[40] He mixed technological optimism and warnings of crisis, following the very popular *Le Défi Américain* by Jean-Jacques Servan-Schreiber. Steinbuch's writings attacked traditional German culture and the CDU as responsible for German backwardness. Steinbuch pinned his hopes on Willy Brandt[41] and campaigned for the SPD in 1969.[42]

Like Benn, Steinbuch appreciated scientific research for producing new technology. He praised the Apollo programme for its spin-offs: 'space technology greatly fertilises electrical engineering, especially computer technology.'[43] He lamented that while NASA was indirectly putting billions into computer technology, Germany invested little.[44] He also argued that space research was essential for communication, weather forecasting, development of new materials, energy storage and electronic steering and positioning.

Like Benn, Steinbuch saw the Apollo programme as a model of planning and interdisciplinary cooperation, which could be applied to solve social problems. Not just an instrumentalist, Steinbuch added that the adventure and stimulation of space served the noblest human instincts of experimentation and curiosity, which had driven every invention and life improvement.[45] Space travel promoted rational thinking, appreciation of technology and activism, not just contemplation — the Moon was not just for lovers, but explorers. 'What should we learn from 20 July 1969? At least this: how to solve a big task. How far-sighted goals are developed, how effective organizations are built and how decisions are made rationally.'[46] If not as much was done to solve problems on Earth, the problem was not Apollo but that people needed Apollo to be inspired. Steinbuch's interpretation of astroculture was well-rounded, as it included both practical concerns about power and imaginative inspiration.

Like Benn and Sereni, Steinbuch believed in mastery over nature — 'The more scientific laws are known to humans, the greater are their technical possibilities'[47] — and that intellectual capital was the greatest productive factor. Indeed, he argued that the space race was the reason for the technological gap between the USA and Europe.[48] Steinbuch's concerns were techno-nationalist and, like Benn, he was haunted by Germany falling behind Southern European countries.[49]

Steinbuch was aware of the drawbacks of technoscience: pollution, alienation and control of communication and databases that could help governments and corporations control individuals and manipulate opinions, making democracy meaningless.[50] To correct this, he had an elaborate plan not just for political reform, but a cultural revolution, which he called a change in programming.[51] Following C.P. Snow, Steinbuch condemned traditional German culture as anti-scientific,

dogmatic and literary.[52] In times of great technological change, what Germany needed was an educational reform to encourage science, critical thinking, adaptive attitude and a new scientifically based morality.[53] Thus, Steinbuch did not conceive science as simply utilitarian and a source of technological tools, but he also saw science as self-contained activity for the expansion of knowledge, which cultivated the rationality and morality of its practitioners. Faced with a rapidly changing world and an overload of information, Steinbuch championed Futorology, believing in predicting technological developments and correcting the consequences.[54] Steinbuch criticised Marcuse, arguing that risks came not from technology, but the power structures outside technology.[55] Like Benn, his solution was more technology and more democracy.

What put him squarely in the camp of Big Science Socialism was the belief that scientists and engineers were naturally progressive[56] — as they were naturally concerned with improving human life — and that socialism was needed for the era of 'perfect technology.' Like Sereni, Steinbuch initially saw intellectual workers and the student movement as a revolutionary force against tradition and failing institutions.[57] As unlimited power could produce unlimited consequences, it could not be left in the hands of individuals or the market, but it had to be put under social control:

> The subjective evaluations to which I subscribe here, i.e. highest priority for health care, for education, for non-violence internally and externally, for equal educational opportunities for everyone, for the social control of raw material production, energy sources and means of communication, for scientific and technical progress are hallmarks of socialism.[58]

According to Eberspächer, Steinbuch was critical of unchecked technological progress, which had to be controlled.[59] Steinbuch rejected the charge of technocracy: technical progress was an instrument, not an end. The use of technology — either the elimination of drudgery or the elimination of humanity — depended on values of the user.[60] Indeed, Steinbuch warned that technocracy was made possible by politicians ignorant of technology, which failed to see that technical decisions or limitations were simply a cover for unstated interests.[61]

The comments of the three figures show that their appreciation of the Apollo programme was actually evidence of a structured worldview that tied the advance of socialism with scientific progress. Realising socialism would require the power to reshape the world through mastery over nature provided by technoscience. Science could also provide a model of critical thinking and progressive values that led to socialist actions. However, in 1969 not everyone believed that the space age would be the age of socialism

Radical anti-scientism: Cini, Calder, Jungk

In the 1960s, the attitude of the European Left towards science began to change, due to, among other factors, the atrocities of the Vietnam War, the challenges to technocracy and the opposition to the Apollo programme. While momentum had been building, the July 1969 moon landing gave an opportunity to opponents of scientism to reach a wider audience, radicalised in 1968. Three figures were most significant in their nation for criticising the first moon landing: Marcello Cini, Nigel Calder, Robert Jungk. Their real target was the marriage of pro-science attitude and left-wing politics, exemplified by Wilson's White Heat.[62] I employ the label 'Radical Anti-Scientism' because their opposition was radical in the philosophical and political sense.

Cini, a physicist, had been a key figure for the science policy of the PCI, but by 1969 he had become more heterodox and he was expelled in 1970 for cooperating with the *Manifesto* journal — a group of left-wing communists expelled for demanding that the PCI take a more revolutionary line in alliance with the student movement. Cini matured a systematic critique of scientism, by combining Thomas Kuhn and Marxism: he rejected scientific objectivity and neutrality and affirmed the social determination of the practice and epistemological content of science.[63]

Cini wrote a rebuttal to Sereni's editorial and criticised the positive coverage of the first Moon Landing by *Unità*.[64] Cini saw in the astroculture promoted by NASA a tool of capitalism and subverted this interpretation with his own array of images that stressed the capitalist and imperial character of space exploration. He mocked the landing as an empty religious ritual that hid the division of oppressors and oppressed. After all, it was just by mere chance that the three astronauts were not in Vietnam, dropping napalm on women and children. Cini argued that the Apollo Programme was complementary not alternative to the military complex. No different from Nero's *panem et circenses*, the space programme served just to strengthen the economic and military power of capitalism — a point also made by Marcuse.[65] The Apollo programme was 'an ignoble deception' to convince common people of 'the idea that this [technological] progress will solve or at least begin to solve their problems'[66] without dismantling capitalism — an open challenge to technological fixes.

Cini wrote additional articles for the *Manifesto* journal, challenging the idea that space research would produce either expanded knowledge or beneficial technologies. He argued that the US and Soviet space programmes produced not scientific progress but military technology: intercontinental nuclear missiles and satellites for surveillance and communication.[67] Economically, the space programme only strengthened industries tied to the military. Even the ideological character of Apollo — bravery, fame, spirit of exploration — were linked to the bourgeois system of values. Cini dismissed the idea that spin-offs justified the space programme — even war produced spin-offs. While space technology contributed to micro-electronics, computers and communication satellites, these technologies were luxuries for the rich. To satisfy the basic needs of the poor, the money should have been spent on researching medicine and agriculture: 'Then, it is not rhetorical to argue that those who have chosen to send two men on the moon condemned to death million other people with that choice.'[68] Scientific research was still to be judged not on its own merit but on its technological output.

Cini advanced a Marxist interpretation of technology different from Sereni's. Under capitalism, consumption could not keep up with rising productive capacity because the labour value of the workers was appropriated for profit and not turned into wages. In order to postpone the crisis of insufficient demand, the capitalist state stimulated unproductive expenditure, such as scientific research or superfluous consumption for the privileged minority. Cini argued it was a mistake to distinguish between productive forces and relations of production to argue for the neutral character of science or to believe that promoting scientific progress — thus technological progress and production — would hasten the revolution. Cini said that science was part of capital and oppressed the workers. Capitalism did not simply 'use' science, it 'shaped'[69] science by selecting its priorities and methods; without capitalism, scientific research would have been different:

> What is the point, if this is true, to ask that 'science serve the needs of man,' forgetting that in the capitalist system everything, both science and human life, becomes a commodity, that relations between men are reduced to relationships between things, that the relationships between things dominate men themselves and make them subservient?[70]

Cini criticised the Soviet Union for having developed a space programme for defence and propaganda reasons instead of extending the revolution worldwide. The technological revolution forced the socialist society to compete on a terrain chosen by the adversary, thus introducing inequality, wasteful consumption and bourgeois morality — 'spirit of conquest' and 'idolatry of the technical efficiency'.[71] This critique of scientism had political consequences: if scientific progress did not weaken, but it strengthened capitalism and intensified exploitation, there was no point in reforming science policies or condemning 'Luddites.' It was also wrong for the trade unions to fight for more private consumption for the workers, since their needs were artificially stimulated by capitalism. The point was that revolution would not come from more science and more production, but from the revolutionary consciousness of the workers, their ability to image a new society and practice new forms of power. What they needed was not natural sciences, but

the science of Marxism. Cini embodied the views of the 1968 radicals in Italy, who were dissatisfied with the timidity of the PCI or the USSR and saw in Vietnam and Cultural Revolution China a model to imitate.

In Britain, the challenge to the hegemony of scientism in politics came from Nigel Calder, a science populariser. In the 1950s and 1960s, Calder influenced Labour's policy on science and advised Benn.[72] Like Cini, Calder matured a different stance throughout the 1960s. Already in 1964 Calder lamented that Tories and Labour agreed on a planned mixed economy, growth and economic modernization to finance the welfare state. There was also a convergence between East and West, as modern science required state intervention. Unlike Benn, Calder did not welcome this process. The long-term direction of social developments was not debated, but left to 'short-term quests for efficiency,'[73] despite the many drawbacks of technological society: physical and mental stress, pollution, nuclear annihilation, overpopulation, overmighty governments. 'Only Drs Pangloss and Strangelove could be happy about present trends.'[74] Like Benn, Calder called for more democracy, unlike Benn, he believed that democracy needed dialectics between a party promoting the technological future and a more conservative party for 'preserving human welfare and values'[75] favouring small business and decentralization, defending the countryside and historical city centres and analysing the psychological and social effects of technological change. Even Calder identified science with its function of producing technology, while doubting the value of the technologies it produced.

By 1969, Calder had a wider audience for his arguments, which he articulated in his book *Technopolis*, using the Apollo programme to support his claims. He lamented that technological development had taken a course of its own, regardless of social considerations or even technical obstacles, because of the lack of scrutiny from politicians. Calder interrogated the enthusiasm for mastery over nature: 'Advance in science and technology forced a re-examination, not just of how best to achieve pre-existing social goals, but of what the social goals ought to be.'[76]

Technopolis castigated the Apollo programme as exemplary of wrong science policies: little scientific and practical value, little thought about what to do with the skills and the equipment produced.[77] The fact that Kennedy approved Apollo against his scientific advisers showed that experts and science played little role in such decisions.[78] The propaganda to sell the event 'would make a deodorant advertiser blush.'[79] Calder argued that technological resources had been diverted to the Moon instead of solving air pollution or feeding the Third World — 'fields in India would go untilled in order that the Americans could put men on the Moon.'[80]

Not only was Apollo not in service of scientific knowledge, it did not produce useful technology. Observation and communication satellites were useful space technology, but it was the uselessness of Apollo that made it easier for politicians to approve it: it was a new luxury offered by technology, which did not affect the everyday life of people.[81] Solving problems on Earth was more controversial, as the solutions would have involved political debates on the structure of society or touched vested interests. Likewise, politicians were attracted by 'technological fixes' because they allowed to postpone more controversial political and social decisions.[82]

The central plea of Calder was breaking the stifling consensus on material wealth and technonationalism and introducing democratic dialectics between 'technological opportunism' — a commitment to material progress — and 'scientific conservationism' — the preservation of human and environmental welfare to the cost of material progress.[83] He also feared computers controlling citizens and eliminating nonconformity.[84] Decisions concerning scientific research and new technologies needed to be controversial, debating the pros and cons, especially if they concerned taxpayers' money. Socialist and conservative voters felt alienated because their leaders did not object to technological unemployment or to big scientific projects financed through taxes. Like Cini, Calder was disappointed by the lack of real alternative in British politics due to the similarity of left-wing and right-wing parties in their celebration of technoscience. His intellectual critique was meant to produce a real alternative.

In West Germany, it was Robert Jungk who used the Apollo missions to criticise scientism. Jungk saw in the post-war period not optimism and renewal but continuing possibilities of totalitarianism and genocide. In his 1952 bestseller *The Future is already here*, Jungk condemned the hubris of technological society.[85] In late 1960s West Germany, Jungk and Steinbuch worked together in establishing the institutions for Futorology, but they disagreed on the July 1969 moon landing.[86] Not only Jungk believed that other goals — such as making cities suitable for human life[87] — would have been more deserving of money and scientific manpower, he saw the Apollo programme as strictly tied to the military.[88] Despite NASA's professions of innocence, the same engineers and industrialists shifted freely between arm manufacturing and spacecraft. As taxpayers proved unwilling to finance civilian space exploration, the space industry would need the military budget to survive. Thus, the advancement of science was just an excuse to justify the production of new military technologies. Just like nuclear weapons, the Apollo programme was decided in secret and without democratic scrutiny.[89]

Jungk diagnosed as a distinctive feature of scientific research after World War II the impossibility of neutrality: science influenced everyday life and science was not immune from social forces. Because of immense costs and large-scale coordination, research was not driven by scholars, but state and businesses. Financers turning the tap could make one research field flourish overnight — for example space research — and stifle another. Most new technologies, such as computer and robots, were used for violence and destruction because they had been built with scientific funding from the military, nuclear agencies and NASA.[90] Reversing the charge, Jungk argued that it was society that had perverted science, favouring 'physical power and political or economic dominance' over 'preservation of health, the protection of nature, the reproduction of beauty, the increase in spiritual welfare, such as biology, ecology, aesthetics and psychology.'[91]

What humanity needed was not the Apollo programme, but a moral reform. Jungk broke his friendship with Steinbuch by refusing to review favourably *Falsch Programmiert*, as it advanced a too unidimensional view of human beings.[92] Instead, Jungk called for 'Project everyone,' because he rejected the idea that education should encourage children to adjust to the needs of technological logic.[93] The multiform and unique interior life of individuals was more valuable than moon rocks.[94] Like Cini, Jungk turned the symbols of space triumph into symbols of ridicule and failure, building a new interpretation of astroculture that served to condemn capitalism. The future of humanity was not in space, but in developing human potential.[95] Jungk also condemned the communist states, as they had been imbued by the same technological ideas of capitalism — putting the product above the producer, technological tools above humans.[96] Jungk hoped that China would be different. Like Calder, Jungk saw a hollowing out of democratic debate and argued that new politics would need discussing technology and its use.[97] Jungk argued that technology already could do anything, so the question was how to create a humanised technology.[98]

The year 1969 saw also the crisis of German Futorology as a unified project, due to criticism of scientism and opposite expectations about technological progress — also fuelled by the first moon landing.[99] Jungk and Steinbuch drifted apart over student contestation: Steinbuch wanted to keep professorial authority and good relations with private business; Jungk saw the students' movement as a necessary revolt against a scientific establishment complicit with business and state. However, Eberspächer argues that the opposition between establishment and optimist Futorology (Steinbuch) and critical and pessimist Futorology (Jungk) is exaggerated, at least at an early stage.[100] Indeed, Jungk and other leftists chose to treat Steinbuch as their polemical opposite, because they wanted to present their Critical Futurology and political ideas as more radical.[101] This was helped by Steinbuch's radicalisation into conservatism and bellicose polemics.[102] Like Cini, Jungk stressed the importance of not just predicting, but imagining a different future:

> While so far 'enlightened engineers' (e.g. Karl Steinbuch) have been concerned about the consequences of technology and subsequently tried to alleviate negative side effects, the modern futurologist raises the question of whether technical possibilities should be realised before they are realised, in whose interest they are and what changes they could trigger.[103]

What united Cini, Calder and Jungk was a dissatisfaction with ordinary politics, believing that the mainstream left-wing parties were no alternative to conservative capitalists at national level — just like the Soviet Union was no alternative to the USA on the international level. They attacked scientism and technological modernity because trust in the power of science was something that actually united capitalists, social democrats and communists. However, all three figures disbelieved the apolitical nature of science, seeing actual science as a product of the wrong social system. The role of science under capitalism was not to produce new knowledge but to produce new technologies at disposal of capitalists. Because they did not trust the reformability of the state or science, all three protested the waste of taxpayers' money in space. Their search for a more radical alternative made them welcome the political mobilisation of students in the West and Cultural Revolution China. Their harsh condemnation of the race to the moon was a moral rage against a world in which everything was wrong and every value was perverted.

Earth-first: The contradiction of our time

These two extremes are not fully representative of political judgements on the first moon landing. Comments were usually ambiguous and varied. Rather than a coherent argumentation, we can find recurring tropes and arguments. The unifying theme among progressives was reminding of the contradiction between celebration in space and problems on Earth. For example, the President of West Germany, the social democratic Gustav Heinemann, commented:

> Ladies and gentlemen, I am taking office at a time when the world lives in the highest contradictions. Man is about to walk the Moon, and still has not brought this Earth out of war and hunger and injustice. Man wants to be more mature than ever, yet has no answer to a plethora of questions. Uncertainty and resignation are mixed with hopes for a better order.[104]

The 'contradiction of our time' was a term from the opening sentence of the Bad Godesberg programme, originally about nuclear power.[105] The SPD's comment on Apollo 8 circling the Moon said:

> Hardly ever the contradiction of our time has become clearer than in these days [...] With all the pride in the bold and until a few years ago barely conceivable achievements of science and technology, it is depressing to know that the people of this Earth push before them innumerable unsolved problems and are often not able to break a path in the domain of progress [...] The contradiction between what humankind could do and what it actually does becomes more and more powerful, becomes ever starker.[106]

The comment on the Apollo 11 mission was more positive, highlighting the possibilities to solve social problems: 'Humanity at the threshold of the twentieth century has the means and the knowledge to do so. The great performance of the flight to the moon and the return of the three astronauts to our planet proved it.'[107]

The 1969 Conference of the Labour Party also drew on this contradiction to call for action:

> But some of us, while full of wonder at this new dimension in human experience, feel that if anything it accentuates our zones of failure on this planet. Science, technology and superb organization are annihilating distance, yet simultaneously they are increasing still further the chasm between such achievements and the human misery and deprivation to which so many people in so many places are still subject.[108]

PCI's leader, Luigi Longo, praised the bravery of the Apollo 11 astronauts, but warned that on Earth large part of humanity suffered hunger and insecurity.[109] Commenting on the Apollo 8, the editor of *Unità* said that despite legitimate protests of immigrants and hungry people, the space accomplishment demonstrated that goals closer to Earth were also reachable.[110] Antonio

Pesenti, a communist economist, said that socialism was ever more necessary to avoid the concentration of power due to technology — otherwise the world would be divided between a minority of free men and billions of 'helots.'[111] The leader of young communists and future PCI leader Achille Occhetto said that the first moon landing and the Vietnam war summed up the contradiction between the possibilities of boundless development and the backwardness of social structures[112] — social democrat Günther Heyder made the same point.[113] The recurrence of the contradiction trope was due to its rhetorical power: it mixed outrage for Earth's ills and inspiration from the Moon adventure to craft a call to action. These declaration showed clearly that socialists and communists conceived the role of science as producing new technology and thus new power to be used for social goals.

The usual objection to the Apollo Programme was that there were more urgent goals deserving that much money and scientific manpower — once again judging science on its practical results and technological output. As Fishman notes, the formula 'if we can put a man on the moon, why can't we … ' became a cliché even before NASA could put a man on the moon. But while the formula started as admiration for the new possibilities opened by technology — since going to the Moon was the hardest thing imaginable —, soon it became an expression of frustration about what was not being done on Earth — since those more mundane problems seemed easier to solve. 'Going to the moon became the all-purpose yardstick not for accomplishment but for failure on Earth.'[114]

Commentators usually mentioned medicine and aid to the Third World — specifically a cure for cancer and help to Biafra — as problems more deserving of that money. Not only this was topical, it was in line with long-term trends. In the late 1960s, public opinion was becoming ever more aware of carcinogen materials.[115] Indeed, risks brought about by chemical products and radiations were one of the main factors in the change of attitude towards science. The campaign to help Biafra — the secessionist state from Nigeria suffering a starvation campaign that killed 2 million people — was a turning point for the development of a global public opinion and the growth of international NGOs.[116]

Worry about the diseases of technological society was common.[117] The scientific journalist of *Unità* lamented that the USA had chosen to go the Moon instead of curing cancer or ending hunger.[118] Speaking about a recent heart transplant, a Labour MP said: 'I find far greater pleasure in a photograph of Dr. Blaiberg swimming in the sea, or having finished a game of tennis, than I do of astronauts having returned from the moon.'[119] Interestingly, others saw heart transplant as a luxury for the few like the moon landings.[120] Some MPs wanted more research to help disabled and mentally ill people.[121]

The contrast between the expenses for the Apollo programme and the lack of financial aid for Biafra was common in Britain[122] and Italy,[123] but most famously it was used by writer Günther Grass, who in August 1969 was campaigning for the SPD. Grass admired the first moon landing, but he doubted it would be useful: 'Landing on the Moon has made the discrepancy between the achievements in space and the failure on Earth clearer, bigger and more frightening.'[124] The achievements of the USA and the USSR in space did not cancel their imperialism in Vietnam and Czechoslovakia, their supply of weapons to African wars and their responsibility for famine in Biafra and elsewhere.

The moon landings also offered the opportunity to criticise the USA for the Vietnam War and domestic problems.[125] As one British socialist said about the National Health Service: 'We admit the defects and the deficiencies but there is no better service anywhere. We have not put a man on the moon but the United States of America has no health service.'[126] An Italian teenager, interviewed by *Unità*, said that USA spending money on the moon landing with all their problems at home was like a person living in a hut buying a Jaguar.[127] Italian Communists used the topic of the Moon to expose backwardness in capitalist Italy. A teenager living a shack on the periphery of Rome contrasted the futuristic life in starship and air-conditioned skyscrapers with his life, much closer to cavemen.[128]

That the first moon landing united humanity was also a common trope. The transmission of the event on live television — made possible by satellites — was one of the first truly synchronous global experience. For Steinbuch, this proved the existence of an 'informed society.'[129] Likewise, pictures of Earth from space stressed its unity and fragility. Progressive opinion used this to articulate arguments for international cooperation, pacifism, ecology.[130] Others, including Cini,[131] argued that the idea of a united humanity was a capitalist hoax: 'The problem is that there is no abstract "man," there are concrete men: in the present world, concrete men are capitalists and workers, American petit bourgeois and Indian pariahs, and so on.'[132]

New synthesis beyond technocratic socialism

Despite the spread of Earth-first critique, we can find the imprint of Benn, Sereni and Steinbuch in the social democratic and communist attitude towards technoscience and, consequently, in key political and strategic questions.

Benn's case is straightforward: as Minister of Technology, he could shape Labour's science and technology policy. He was not the only Labourite to use pro-science arguments to justify state intervention. MP Arthur Woodburn said that the rationale for putting a man on the moon was 'a lot of bilge,' but 'the technological fall-out [...] will change the face of the world.'[133] Charges of wasting money and talent — such as with Concorde — were not justified: 'In any scientific research there is bound to be some waste; every egg is not hatched, but the egg which is hatched may revolutionise the world.'[134] Space capability was seen as an extension of the US and Soviet aviation industry, so many European leaders welcomed the possibility of pooling resources in space research and civilian aviation.[135] Labour MPs and the SPD argued that aerospace industry needed European cooperation.[136]

Sereni also left his mark on the party line: Longo embraced Sereni's definition of science as direct productive force and accepted that students as scientific workers played a political role comparable to industrial workers.[137] This became the official policy towards science in the 1969 congress and the special conference about science.[138] There was also a techno-nationalist component: due to bad science policies, Italy had failed to catch up with developed countries and would fall further into backwardness.[139] Modern scientific and economic development required socialist solutions and only the working-class could assume the leadership role in modernising the nation, as Gramsci had argued. Other communists saw advances in science preparing social changes — as Einstein's theory had preceded the socialist revolutions and the anti-colonial movement.[140] Central was the metaphor of mastery over nature and freedom: the more humans broke the constraints of natural laws, the more the artificial bonds of society became unbearable. Science, as a originator of new technologies, was a stimulus to social change:

> In any case, from the point of view of the working class, it has always been better to have research centres conditioned by power groups, than to have none at all: because research is a spring that, even when it pushes little, pushes towards progress, and because it always ends up countering established interests, even when they believe they can enslave it.[141]

In the case of the SPD, although Steinbuch was not a card-carrying member, he was close to the leadership: he was contender for Minister for science and education in 1969 and collaborated with the Brandt government. [142] Some social democrats adopted Steinbuch's slogan 'the informed society' and his concerns. Important leaders such as Herbert Wehner repeated Steinbuch's arguments on international competitiveness, nuclear power, computers and space technology, expanding scientific teaching and guaranteeing equal educational opportunities, data processing, the brain drain, polemics against traditional culture.[143] Among future leaders of the SPD, Helmut Schmidt insisted on the need of educating the workforce to keep up with technological progress[144] and Hans-Jochen Vogel had ideas on planning similar to Steinbuch.[145] Not only the party accepted many of Steinbuch's ideas, but it accepted the need of Futorology

for planning long-term policies.[146] Future minister of technology Horst Ehmke quoted Steinbuch approvingly.[147]

Brandt also took Steinbuch's line on many points. He castigated Christian Democrats for their suspicion of modernity, urbanism and industrialization: 'While the members of other nations fly to the moon, our conservatives in the Bundestag come up with the experienced advice that trees do not grow to the sky' — a reference to a German proverb.[148] He was against 'growth fetishism,' but he warned that social consciousness had to keep up with scientific developments: 'We have to live with this future, not against it.'[149] Brandt also praised computers, cybernetics and adaptive planning as a way to solve social problems. Social democrats would not allow Germany to fall behind other nations.[150] Like Longo, Brandt argued that the SPD was the party of all workers, including scientific workers.[151]

On the other hand, Cini, Calder and Jungk were still marginal and their significance is in the long-term. Cini's critique of scientism would help the development of more radical form of Italian environmentalism, which identified capitalist profit as the main threat.[152] Calder had a huge influence in the birth of the first environmental organizations in Britain.[153] Jungk would play an important part in the peace movement in the 1980s.[154] At the time, they were significant because they produced a coherent intellectual framework to express inchoate feelings about technoscience, specifically about the misuse of technology and the lack of democratic control. The Labour Party, SPD and PCI could not fully accept Radical Anti-Scientism — as it was too inflexible to reconcile the disparate social interests they represented — but from now on social democrats and communists started to develop a New Synthesis, a third way in their attitude towards technoscience, which reduced technocratic elements in favour of democratisation and greater attention to technological risks and drawbacks.[155]

The third way was clear among German social democrats: while they appropriated Steinbuch's themes, they opposed unlimited financing of technological innovation. Public funding for research had to be subjected to democratic scrutiny and balanced with social expenses: 'The conflict over financial sacrifices for education, welfare and social reforms on the one hand, and the safeguarding of progress in technology on the other, must also be discussed politically in the Federal Republic before it is carried out.'[156]

Karl Schiller, Brandt's minister for economic affairs, argued that education was essential for German economic competitiveness.[157] He recognised that under full employment only technology could increase productivity and that promoting technological progress was a state responsibility.[158] However, he wanted to avoid financing those indirectly through armaments and space exploration. The Federal Republic was not a big power and could not compete in the Space race, but it had to find its niche in the world market: 'Technical progress is not only taking place in space, but also in urban and residential construction, in the development of efficient transport systems, in the improvement of environmental conditions and in the rationalization of public administration, which is becoming ever more expensive for citizens.'[159]

Ulrich Lohmar, the SPD's expert on science, recognised that space and nuclear research drove technological progress in the USA and human capital was decisive to increase in productivity,[160] but he warned against socializing the risks and privatizing the profits of research.[161]Hans Leussink, who became Minister for science instead of Steinbuch, made the same point.[162] Leussink stressed that education and research were more valuable for democracy and the humanization of technical civilization than productivity.[163] Conversely, Lohmar recognised the interdependency of science and society, but criticised the extra-parliamentary left for their demand of an ideologically-compliant science. The SPD clearly kept a middle position between Steinbuch and Jungk, while also recovering science as non-utilitarian expansion of knowledge.

The PCI also played a balancing act between Sereni and Cini. The PCI's expert on science, Giovanni Berlinguer, answered to Cini that the space race and science in general did not have merely a reactionary character: 'every scientific conquest accelerates historical processes, generates opposite forces, brings with it the seeds of destruction or progress.'[164] Quoting postwar

leader Palmiro Togliatti, Berlinguer said that the 'destiny of humankind' was open-ended, because science infused duality in every social aspect: 'science becomes instrument of liberation or exploitation and raises all social questions to a new level.'[165] Berlinguer still accepted the distinction between productive forces and relations of production, although he rejected that the growth of productive forces would automatically lead to a revolution — though not even Sereni believed that. As for the first moon landing's coverage, there was nothing wrong balancing celebration and critical analysis: better to align with the masses than seek purity. Indeed, as another communist wrote, it was elitist of Cini or Marcuse to believe the masses were too gullible to be enthusiastic and critical at the same time.[166] Other communists rejected anti-scientism: 'A technocratic view is, therefore, unacceptable, as equally unacceptable is its Romantic reverse-complement that thwarts (like all spiritualisms) not only the role of science but rational thought itself.'[167] Indeed, talking about technological risks prevented attributing those risks to capitalism.[168]

For the party leadership, Giorgio Napolitano closed this internal debate by agreeing with Sereni that the growth of productive forces would create a contradiction with the relations of productions and thus revolutionary potential.[169] I argue that what really mattered for the PCI leadership was political strategy: the PCI could not follow Cini's line to the logical consequences, i.e. that without dismantling capitalism it was impossible for science to serve anything but capitalist interests. While Berlinguer and Napolitano denied that scientific progress could solve human problems without changing political and social conditions, their strategy was based on the assumption that revolution was not a single insurrection, but a long-term process. The political struggle on many fronts demanded tactical alliances under communist leadership, which required incremental goals — such as 'the employment of science at the service of man'[170] — even without a complete change of power relations.[171] The contentious issue was whether a gradualist path to revolution existed.

Despite the six moon landings being successes for the USA, Western communists offered celebration equal to criticism and they were less harsh than the New Left and some bourgeois commentators. They knew it was a propaganda coup for the USA, but they mocked the idea it could compensate for imperialist crimes.[172] Doubtlessly criticism of the US space programme could not be harsh enough to cast doubts on the Soviet space programme — comparatively more expensive. Italian Communists argued that the Soviet unmanned missions were safer and more scientifically significant; while it is true, the impression is that Western Communists were trying to remind a distracted public that the Soviet space programme also existed.[173]

The Soviet attitude also divided the PCI from the extra-parliamentary Left, which took the Soviet space programme as evidence of the betrayal of the revolution.[174] They were even more critical of the first two moon landings: 'But we don't give a damn about this coarse festival.'[175] The *Lotta Continua* group dismissed the moon landings — 'the throne of moon dust'[176] — not as an accomplishment of humankind, but an accomplishment of white Americans. The space programme truly continued the age of exploration, because it had a colonialist and military character — the painter Guttuso said the same.[177] The adventure was just propaganda to cover the crimes of imperialism.

Finally, the Labour Party was also changing. By 1970, the Labour Government had restructured British science policies,[178] but rhetoric and promises still lagged behind. The 1970 Manifesto celebrated the potential of scientific research for technology and committed to space research within European cooperation.[179] Significant change was noticeable in members of the Labour leadership, such as Tony Crosland. Crosland warned against a return to the ideas of state-led technological innovation of 1964.[180] He advised against pursuing every technological innovation regardless of the social or economic cost — mentioning Concorde as a negative example. Unlike Benn, Crosland believed that technology and economics of scale had not provided a clear solution to slow growth: 'Nobody can claim to know the answer, and there is manifestly no short-term panacea.'[181] At the same time, Crosland refused to embrace the

environmentalist ideal of a life close to nature and devoid of consumerism. He interpreted rejecting technological comfort, modern civilization and economic growth as an elitist disdain for the desires of normal people. Crosland sought a middle way between Benn and Calder, what today would be called Eco-Modernism.

It is clear that while the three parties were shedding some technocratic elements, they could not fully discard technological solutions, which were still part of their economic and environmental policies. Conversely, the challenge of the extreme left was political: a full rejection of any compromise with the system, including technological modernity. The more radical option could be a spur for change, but never substitute the ideology of the main left-wing parties.

Conclusion

According to Kilgore, astrofuturism was inherently political: space was the background against which competing visions of the political order interacted, whether conservative, liberal or utopian.[182] With the concept of astroculture, Geppert insists on the openness of the concept of space, to which multiple and contrasting meaning could be assigned. These frameworks make space a fruitful vantage point to compare political cultures and the documentation analysed above demonstrates the multiplicity of political visions that gravitated around space research and science in general. This approach is useful to treat space history not just as a subject of history of science or as an aspect of the confrontation between the superpowers. Cold War history is now more focused on the local and granular dimension of the conflict, uncovering how local actors reacted and acted on the bipolar confrontation. Astroculture allows to bring space research into new fields. By examining what values and judgments local actors attributed to space exploration, this article has reconstructed their ideas concerning science and the capitalist system.

Classifying the comments on the first moon landing and the Apollo programme in general as either 'Big Science Socialism', 'Earth-first Critique' or 'Radical Anti-Scientism' helps uncover some long-term trends. The comments under 'Big Science Socialism' indicates that the pro-science paradigm, which had been dominant a decade before at the time of the Sputnik, was still present, but under challenge. Calder, Cini and Jungk started from open criticism of space enthusiasm indicating that anti-scientism was beginning to coalesce into coherent political expressions. Nigel Calder identified this shift at the time, contrasting it with the 1930s' 'optimistic dreams of a New Jerusalem built by the application of scientific ideas.'[183] While the six moon landings had historical and global relevance, space is only occasionally an issue in political debates in Western Europe. However, these comments anticipated the structural reshaping of the European left in the 1970s and 1980s around other science-related issues such as the environment and nuclear power.

All the four categories were present in each party, but national and ideological differences changed their degree. While German social democrats employed technocratic rhetoric for the economy, they also insisted more on the democratization of technology. Appreciation of the Soviet Union and its space programme made Western Communists less likely to condemn any space programme — the more pro-Soviet French communists were even less critical than Italian Communists.[184] Socialists in Britain and Germany — then in power — were more likely to praise Europe compared to the USA, while Italian communists — in opposition —denounced the misery in Italy.

It must be noted that few people had a systematic theory for contesting scientism. Most criticism was vague and it often coexisted with admiration, as the following episode shows. When the astronauts of Apollo 11 visited Rome, the mayor received them on the Capitoline Hill. A group of mothers and children from the periphery took the opportunity to protest against the conditions of their neighbourhood, specifically the lack of a proper school building. One of the

placards said 'The school is our Moon.'[185] However, when the astronauts arrived, the protesters cheered and applauded them.[186] Elsewhere around the world, the visit of the astronaut provoked celebration and reinforced the USA's prestige, although criticism for the excessive expenses for the Apollo programme did not disappear.[187] Rather, for ordinary people admiration could coexist with criticism. Nuance was easier to find in a spontaneous mob than in intellectuals.

In the end, the reaction to the first moon landing showed the exhaustion of an old paradigm and the political unsuitability of the new, demonstrating the need of a new synthesis to approach science as Western Europe was changing its attitude. I argue that the environment in which social democrats and communists sought a new synthesis was not as favourable as the older pro-science enthusiasm. The older paradigm was perfectly suited to justify the statism and social engineering that underpinned both the Welfare State and Soviet communism. In the new context, the New Left was not alone in contrasting pro-science statism. Neo-liberals also opposed the waste of public money. 'By the early 1970s neo-liberal economists were attacking state-led investments in aviation and nuclear power with considerable strength.'[188] Keith Joseph, the intellectual father of Thatcherism, extensively criticised Labour's science and industrial policies for using 'taxpayers' money for industrial lame ducks and white elephants.'[189] Walter Scheel, the Liberal Vice-Chancellor of Brandt, saw in the success of the Apollo mission the superiority not of large scale organization, but the freedom of thought and research.[190] Likewise, not all criticism about the idolatry of progress and the dehumanizing effect of science came from the New Left. Conservative MP Stephen Hastings — staunch supporter of Rhodesia — complained that scientific modern society was sick due to hedonism and equality.[191] Ex-fascist philosopher Ugo Spirito described science transforming society into impersonal, material collectivism, whether under capitalism or communism. The Apollo programme was 'the communism of science and technology' with the individual genius submitting to anonymous, bureaucratic forces.[192]

What was significant of reactions to the first moon landing in the long-term was that left-wing statism suffered a two-pincer attack from the New Left and Neo-liberals. If the state and politicians had wasted public money in useless things like the Space Race, should the state and politicians be trusted with economic power? Of course, the New Left had the moralist argument that the money wasted by the state should have gone to the wretched of the Earth, but, in the 1980s, it was Neo-liberals who won the political debate, with the more seductive argument that the money wasted by the state should go back into the pockets of the taxpayers.

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