

University of Sussex
SPRU - Science and Technology Policy Research
Chris Freeman, our founding Director, died on
16 August 2010.

It is with great sadness that we report this, but with great joy of having known him and gratitude for all he contributed to our lives and to the lives of others.



Letter from Family Members

(<http://www.sussex.ac.uk/spru/about/letter>)

Christopher Freeman 11th September 1921 – 16th August 2010

A light has gone from the world. Christopher Freeman passed away early on Monday 16th August at home, surrounded by those he loved, looking out over our small garden to the open blue skies beyond. On 11 September he would have been 89. To many he is known as the creator of the Science Policy Research Unit (SPRU) and a founder of the theory of innovation, the economics of science, and the systematic study of long-term movements in economic growth, for which the world is in his debt.

As his children, we knew more. Son of Arnold, Sidney Webb's secretary and an early pioneer of the Workers' Educational Association, Chris left school as an idealistic communist. Plunged into war, he was spared none of the horrors on the Western Front or in the Camps he entered with the advancing allied forces. Witness to the worst and best of what humans could do to each other, and propelled by great love of humanity, nature, and art, he sought to build a new world with his wife Peggotty, a socialist and talented linguist of American and German Jewish parentage. Blacklisted in academia, he embarked on the life of a working class organiser, first with the WEA in Clydeside, then the Daily Worker, followed by the Society for Cultural Relations with Russia.

His close contact with inner circles of the German communists had already led him, sadly and with great pain, to conclude well before he left the party in 1956 that it was not the vehicle for a future he never ceased to work for. A spell with the Post Office and then the London Export group, specializing in trade with China and Russia, opened a door at the National Institute for Economic Research. He soon dedicated himself to marrying economics to science, which he saw not just as the vehicle of enlightenment but as the means end poverty and suffering worldwide.

At the invitation of Sussex Vice-Chancellor Asa Briggs he established SPRU in 1966. A twin of the Institute for Development Studies, it was born in an atmosphere of renewal driven by an alliance between the *Mitteleuropaische* intelligentsia that poured into the country before and during the war, and the spirit of scientific endeavour that had shaped Britain from the Industrial Revolution to the apocalyptic discoveries of wartime. These pioneer institutions were wrought almost from nothing, the joint work of a band of fellow-idealists from all countries and walks of life who wandered in and out of our house in bewildering numbers, many remaining our friends today. His engagement with this 'invisible college' of scientists and political theorists framed what was becoming postcolonial Britain; its outlook is conveyed in a lecture on J.D. Bernal singled out for us by several of the hundreds of students and researchers whose rise to eminence took them through SPRU's portals. (vega.org.uk/video/programme/86)

His remarkable partnership with Carlota Perez launched another chapter of this story. The doubts and fears that shaped his young years still haunted his children. The shadow of the Bomb still hung over us all, while cruel invasions, barbaric oppressions and grinding poverty still stalked the world. An emerging environmental crisis was already becoming evident. For Chris, science was the means to human liberation, but required governance, direction, and institutional support to put it at the service of the poor and forestall its abuse by the rich. He poured out papers and ideas, assembled on freemanchris.org, a collaboration between Carlota and his grandson Leo, and on SPRU's website at sussex.ac.uk/spru/about/chris. His world view brought him almost visionary foresight, bringing to attention issues only now entering popular discourse. His devastating critique of the OECD's 1976 McCracken report was one of the first clear economic judgements that post-war growth had come to an end, and would not return without conscious state and institutional intervention. Even as the Soviet and Eastern Blocs fell apart, he was by the end of the 1980s predicting the Chinese Economic miracle. He began writing about green technological revolution in the early 1990s; a remarkable interview, whimsically published in 2000 as *If I Ruled The World*, outlines a manifesto for a hypothetical 'first woman president of the USA' to be elected in 2004, which could easily serve as required reading for Obama's advisors today.

Professor without a doctorate, his tolerance, aversion to elitism, and his engagement with the personal lives of his friends and colleagues is legendary. Yet it was not a casual or accidental personality trait but the outcome of reflection on the human costs, witnessed first hand in his youth, of acting otherwise. Appreciation and acceptance of diversity were woven into his approach to life as much as theory. As a crabbed neoliberal dogmatism began to close in on his profession, he joined his name to the first modern call for a return to pluralism in economics, published in the *American Economic Review* in 1992. The breadth and depth of his gifts to economic theory is an enduring testimony to an inspiration which helped so many others, whether of his mind or a contrary one, to give of their best.

Chris's love for the world was witnessed by all he came in contact with, especially his five children, his five grandchildren, his first wife Peggotty, his second wife Maggie, and his widow Carlota. A nature-lover long before it became fashionable, he was a passionate and active member of the Royal Society for the Protection of Birds. At the time, we may have complained about a succession of far-from-conventional bird watching holidays in marshes, windswept seashores and probably, were it not for Peggotty's intervention, sewage farms, but our time spent learning bird calls and listing strange species has brought its reward: in every distant cry from every creature flying overhead to distant places, we hear the voice of our wonderful father, free at last.

Lieutenant-Captain, father, comrade, Professor; may the world return the love you gave it.

Alan Freeman / Tom Freeman / Kathy Freeman / Susan Freeman
Lewes, Friday, 20 August 2010

Chris Freeman Remembrances

(<http://www.sussex.ac.uk/spru/about/chris>)



It is with great sadness that I heard that Chris Freeman, a brother in arms for over thirty five years, a mentor and a very dear friend, passed away last Monday, August 16th, 2010. As we did every year, my wife and I were just starting to organise our visit to Lewes to see him for his 89th birthday. Something we promised him at the 80th birthday celebrations in Lewes back in September 2001. It brought us nearly nine years of fond birthday celebrations with him, Carlota Perez, Pari Patel, his wife and many members of Chris's family to cherish and to remember.

My academic but also my personal life has been heavily influenced by Chris Freeman. I first met Chris when I was a PhD student at SPRU back in 1975. Chris was not just an extraordinarily well read scholar, but he also had a unique personality which could probably best be described as what I would call "anti-elitist". This was clearly engrained in his political convictions but he was probably the only person in the world who would apply it so consistently to himself. To the dismay of Carlota and probably most of his friends, growing older he would stubbornly refuse any sign of the slightest favouritism, for example in getting his hip replaced and thus waited and waited in the NHS queue for an operation.

I still remember vividly my first visit to his (previous) house with my wife on a Sunday afternoon somewhere in 1977. Daisy, his youngest daughter must have been about 18 months and was as lively as ever. Chris was hanging up the nappies, preparing tea, running around with biscuits, and while paying attention to us as his guests, continuously discussing with his daughter. What struck me then, and what continued to strike me over the years, was the particular attention he gave to children, young or old, in exactly the same way he would give it to grown-ups. It was as if their words and ideas were as important to him as say, Nick Stern whom I once met at Chris' house visiting and whose father Chris had known well. Chris had this incredible capacity to be open and equal to everybody: getting a cup of coffee or a chair for his secretary came as natural to him as debating "Malthus with a computer" with Graciela Chichilnisky and Sam Cole. It was this total absence of arrogance, this inert anti-elitism which was probably the most striking characteristic of Chris and which charmed me and so many others.

At SPRU, I did my PhD supervised by Charles Cooper and Chris became one of the examiners of my thesis with Michael Posner. If he hadn't been there I think I would never have passed that viva. Posner, who at the time was inundated at British Rail had probably not had the time to read my thesis. The defence was in his BR office in London and he was called out of the meeting every now and then. In the end it became a lecture by Chris to Michael Posner about all the new, interesting things which had happened to the technology and trade literature since Posner had written his paper

in 1961 and which could all be found in my thesis. We came back together from London and had a good laugh... The seventies were also the days that I spent many hours with Chris on boat trips from Newhaven to Dieppe and then on to Paris to meet the OECD crowd: Alison Young, Yvan Fabian, Jean-Jacques Salomon, Geneviève Schmeder amongst others. Times I do remember with great fondness: often we were accompanied by Keith Pavitt. Keith had actually only one purpose in going to Paris – watching French cinema – so we dropped him off at the movies, went off having a good meal and spend hours in long discussions.

It was also Daisy who was ultimately responsible for getting me more closely involved in Chris Freeman's research. Back in 1976, I had of course listened with fascination to Chris's devastating critique of the OECD McCracken report and his radical thoughts on a structural break having occurred in the period of long-term, full employment growth in OECD countries. And I had also been excited by his thoughts on Schumpeter and in particular on the possible existence of Kondratieff long waves accompanying the emergence of "clusters" of new technologies. But at that time I was working with Keith Pavitt on the technological competitiveness of British industry. In 1979 Chris was invited to go to Bochum to what was considered at SPRU to be the most important conference of the year where Chris would present his Schumpeterian long wave ideas in the midst of economic historians. The day before the meeting Daisy fell ill with flu and Chris decided not to go. Charles Cooper, John Clark all declined when asked whether they could replace him, so in the end I went. I presented Chris's ideas and became myself quickly addicted to the radical nature of them. Those days were revolutionary times at SPRU. I won't elaborate here on this, but I remember Ian Miles shouting one evening when we left the SPRU building after a ferocious debate at the SPRU seminar on technology and unemployment to Chris and myself: "Luddites!"

But it gradually became the area where I got myself most closely involved in writing with Chris and many others at SPRU, from John Clark, Roy Turner to Giovanni Dosi, Pari Patel and last but not least Carlota Perez. Chris always provided the inspirational quality, the wealth of historical references to authors some of us might have heard of once, but never read anything of.

And then there was the way Chris would make a presentation: impossible to imitate. There wasn't just the oral quality of the lectures given without a single note, without a single hesitation but also the intensity with which he could present his, as well as others, arguments that made you hang on to his every word. Chris' seminars were overcrowded with an audience often begging him not to stop, but to continue his talk. What was so incredible is that Chris' unique oral talent in ordering and expressing his thoughts in both a clear, analytical, logical and compassionate way, was also the exact way he wrote. With sentences which were perfect, where nothing needed to be added. It probably explains why I loved writing with Chris so much from then on!

From the late 70's when, I together with John Clark became involved in the book Chris wrote for Frances Pinter – another person who was very fond of him – on Unemployment and Technical Innovation to the last joint publication in Research Policy last year, we always fought on who would be second author. I am delighted that, sometimes while cheating I often succeeded in winning the battle. Chris' passing away leaves us all with a great empty space: the one you could call up to congratulate, lately unfortunately often to sympathize, with the latest performance of the British/Sheffield football team; the one who would ring you for your birthday, send flowers for your wife's birthday; the one who was always ready to go along with crazy ideas; to passionately defend his views or stubbornly would disagree with you.

Over those fifty or so last years Chris influenced thousands of researchers, policy makers and students across the world in the fields of science and public policy, research and development

measurement, the history of social science studies, Schumpeterian and evolutionary economics, research evaluation, innovation management, technology and innovation policy as well as in making both macro- and micro-economics, international trade and economic history more aware of the central role of technological, institutional and social change. Funnily enough, he did so, not by using Information and Communication Technologies, which he had studied so much, but through personal contact, through being available to all without any exclusion and through his openness to alternative views and ideas.

Luc Soete

UNU-MERIT, Maastricht, The Netherlands

Since I first came across 'The Economics of Industrial Innovation' as a young student 35 years ago, Chris Freeman has been my inspiration. Together with a few others such as Dick Nelson and Nate Rosenberg, he helped to create the field of science policy and innovation studies.

Besides his immense intellectual contributions, in particular on the economics of innovation and on systems of innovation, Chris was also very much 'an academic entrepreneur'. Among the innovations for which he was responsible was 'The Frascati Manual', and the subsequent stream of work on S&T indicators at OECD and around the world. Secondly, he set up, shaped and for many years directed the Science Policy Research Unit, SPRU, which during the 1970s and '80s was the leading institution in the field. Thirdly, with colleagues at SPRU and in Germany, he founded and edited for over 30 years the journal 'Research Policy', establishing it as the leading journal in the field.

Chris embodied the notion that the purpose of research is not just to understand the world but to change it - and to make it a better place. He also recognised that this could not be done on an individual basis but required collective effort - working with colleagues in SPRU and with a growing community of innovation scholars from all round the world, including Latin America, Asia and Africa as well as North America and Europe.

He was an incredibly inspiring lecturer, of a type now sadly almost extinct in an age of drab PowerPoint presentations. He was also one of the most intellectually generous researchers I've ever been privileged to meet, always trying to pass the credit for a new insight or some other contribution to someone else, preferably someone junior. Consequently, not only was he one of the most admired of social scientists in the second half of the 20th Century, he was also one of the best liked.

He will be missed by all.

Ben Martin

SPRU - Science and Technology Policy Research

It is a privilege to have known him. Very few people have shaped the way I see the world as much as he has.

Dick Nelson
Columbia University

Professor Chris Freeman was an inspiring and great teacher.

I learned a great deal from him and continue to do so as I reread his works. He was a leader and made generations of students think about the importance of technological change and innovation, as well as the need to know some history when studying economics. He was very much loved by his students, his colleagues and friends. I will miss him.

Nathan Rosenberg
Stanford University

I heard the sad news about Chris. In my memory he will always remain as a dedicated researcher. I will also remember very well when he was enthusiastically building Lego with my boys lying on the floor in my home in Linköping - about 23 years ago.

My warmest regards,

Charles Edquist
Holder of the Ruben Rausing Chair in Innovation Studies
Director of CIRCLE (Centre for Innovation, Research and Competence in the Learning Economy)
Lund University

My condolences with the SPRU staff and the family.

I highly appreciated Chris, both as an author and a person.

Loet Leydesdorff

Such sad news, Chris was a great help to me in the early stages of my career with his unfailing support and generosity of spirit, as he was for countless others. The legacy is large and worldwide. He was a true scholar and beacon in the intellectual darkness.

Stan Metcalfe
Manchester

After a long drive up to the shores of Lake Michigan, I opened my laptop to check up on a day or so of lost e-mail, and in my in-box were a slew of messages reporting on the passing of Chris Freeman. It's apt that I sit here writing this feeling the cool breezes off the gorgeous clear blue lake on this magnificent August day thinking back on his work and life.

Chris Freeman was one of the greatest thinkers and scholars of innovation and the dynamics of the capitalist economy. His impact on me was huge, not just as a thinker but as a person and a role model. He wasn't just a scholar, he was an institution-builder and the institution he built -- the Science Policy Research Unit or SPRU -- helped define the field of innovation studies. He was also a key force behind the journal Research Policy, which published so many key article and essays that shaped this field.

Freeman had a most profound influence on my work. I pulled his books off my library shelves just this past year -- his work on long waves, the bundling of innovation and the role of innovation and capitalist crises as I was working on my latest book. He wrote articles and books packed with data and insight but always in clear, concise language. I've tried my best to follow a bit in his footsteps - - to stand as much as I can on the shoulders of this great intellectual giant.

There is so much more I could say about his work and his influence, but right now I am remembering the first time we met. It was twenty of twenty five years ago -- at a specialized academic conference on innovation. He was a distinguished senior scholar, and me a very junior, very beginning assistant professor. I was very nervous to approach someone whose work I had read and who was something of an idol to me -- and to so many of us at the time. But I made my way over and introduced myself and tried to say something that might connect. What came out, rather awkwardly was this: "So what Professor Freeman, what was it exactly, that drew you to the work of Joseph Schumpeter?"

Perhaps reading my body language or understanding my own influences and thought processes better than I did myself, he smiled kindly and replied straightforwardly. "I've always been fond of Schumpeter, but when it comes right down to it, I was really into Marx. But in those years it was taboo to talk about Marx, so I started writing about Schumpeter and the rest is history."

I was blown away by his honesty and candour - how he captured in that one short remark the nature of the academic enterprise so to speak. It was one of the most important sources of advice and inspiration I would ever receive, and on so many levels. His words have stayed right at the front of my mind to be retrieved whenever needed for all those intervening years.

He will be missed but his work and influence live on.

Richard Florida

Freeman is a towering presence in innovation studies. Indeed, it is through his work that some of us discovered that the field we were looking for existed.

Henry Etzkowitz President, Triple Helix Association

I just heard the sad news of Chris's passing away. We all know what an outstanding personality he was and what was his singular contribution to the emerging fields of innovation studies and systems-evolutionary approaches. Chris also significantly affected my professional development, in particular with respect to the gradual shift from a neoclassical economics education to research in the new area of innovation studies and eventually (with the help of Dick Nelson starting in 1977) to research on evolutionary perspectives .

My first meeting with Chris was in Buenos Aires in 1969 and on the basis of a preliminary talk then, I contacted him after moving to Israel in 1970 and after I began searching for a topic in the area of innovation studies. By responding to two research options I presented to him, in a rather detailed and supportive way, he facilitated my `entry` into the field of innovation studies. This was not easy since my own research up to then was in neoclassical growth and trade models (which included learning and technology, but still formulated in neoclassical ways) which was contrary to the research tradition at the Department of Economics at the Hebrew University of Jerusalem.

During the 1970s I was a regular visitor of SPRU where I found support for the new research trajectory I had begun. Chris's influence and spirit throughout were extremely important and I had regular contacts with Chris, Keith Pavitt and others, including joint work with Roy Rothwell.

He will be remembered and I will miss him,

Morris Teubal

The passing of Chris Freeman is for me a significant event, both because I knew and was fond of him over the course of many years, enjoyed his company and his lively humor on the occasions we were together, and because from the beginning of our acquaintance I was forcibly struck by his vision, his seriousness of purpose, and the sheer energy with which he inspired those who followed him into "the economics of research policy" -- the sub-discipline that he, more than any other individual, had brought into existence and continued to animate for so many years.

Paul David

Chris: A personal note

It feels strange this Chris will not be around anymore. No one has done more to establish the field of innovation studies, and he was the personal embodiment of Schumpeter's dictum of combining a historical perspective with economic theorizing and statistics in the analysis of the long run evolution of the capitalist economy. His academic accomplishments are many and varied. But what I would like to emphasize here is the strong effect he had on other people. Ever since I had my first encounter with him nearly thirty years ago, meeting him always left me with more energy and optimism with respect to what I and my collaborators could accomplish. In later years, when he couldn't travel any more and we did not see each other so often, even thinking about him had much of the same effect. I have asked myself why this was the case. The most simple answer, I think, was that he cared. The stories about the intellectual support he gave to younger people in the early stages of their career are numerous, and I received my fair share of that. Even if he was not my supervisor, he read and commented upon every chapter of my thesis, and he invited me to take part

in stimulating events such as the process that led to the publication of the justly famous IFIAS book (Dosi et al 1988). His engagements in people extended far beyond professional relationships, however. For example, after having met my family, he sent my children, then aged 3 and 6, presents, a practice he continued for some time. Finally, Chris also cared strongly about issues. He was not satisfied with purely academic accomplishments but mobilized his strong intellect and deep knowledge to engage in socially and politically important matters, such as, for example, the unjust distribution of income and welfare in the global economy. Chris wanted to make a difference, and he did. Stuart Blume recently said to me that for him Chris was the role model of an academic. I could not agree more.

Jan
Professor Jan Fagerberg
Center for Technology, Innovation and Culture
University of Oslo

Ergun Türkcan says:

<http://www.freemanchris.org/> - August 24, 2010 at 8:11 am

Chris was like an antique philosopher disguised as a monk-saint with a mission to create a new faith or science, called “economics of innovation”. I had met him for the first time in 1966 November in Lancaster House, then housing the new-born SPRU. Geoff Oldham, Charles Cooper, Roy McLeod, Jackie Fuller the first and last assistant to him, and a small group of researchers occupied limited rooms in the first floor. Jackie, graciously had found a precious room for me i.e., as the first (OECD) research fellow of the SPRU. Chris advised me to read Schumpeter and some other OECD literature.

Chris, then living with Peggotty in Kingston Village near the University, used to commute by foot, even in the rainy days, wearing rubber boots, a precaution against deep mud. As the tank commander and Marshal Montgomery’s driver in the WW2 (once he told me) Chris rejected to own even a cheap automobile, a bourgeois habit. When we visited in 1970 (with Nuşin, my wife and son) the Freemans (and C. Cooper) they were living in Kingston, there were huge geese taller than my son Emre, swarming the garden, he said, “these are my guardians and lawn mowers”.

It was a great honour for me to be participating in an UNCTAD project and paper on the “transfer of technology” (1967) my name appearing with Chris Freeman and Geoff Oldham. On account of my great contribution (!) to this paper, Chris sent me to Paris to participate in an OECD Pilot Team Project’s evaluation conference with my wife, as members of the Turkish team. In fact, he was highly interested in development of poor countries through implementation of S&T plans and policies.

My fellowship came to an end in 1967 and I had to return to my job in TÜBİTAK, but all the time missed the SPRU and friends in Sussex. Next time, I returned to the SPRU to prepare my PhD thesis in 1970, to the Mantell Building. This time Chris had a room but was not the director. The SPRU had a world-wide reputation for being the hub of science&technology and innovation policies research, and education. In March 1971, a military Coup that occurred in Turkey (a well established Turkish tradition!) prevented my further stay in Sussex, since my passport was not extended. As a suspicious person like me, Chris arranged for me a paying project and Home Office work permission, even proposed me to consider political asylum in the UK. It was a difficult decision to make and I finally returned home like a good citizen.

After this I visited UK and Sussex several times. In one of those visits I spent a very enjoyable afternoon with Chris in his house in Lewes. We dined together, talked very much on politics and women. He was recently divorced from Maggie, but they were going to remain good friends.

Last time I saw him, together with Jackie it was in November 2003. I had come to present him the Turkish translation of his famous book Economics of Industrial Innovation (with Luc Soete, 1997). He had written a special introduction for the Turkish edition. My translation of the book into Turkish had been published by TÜBİTAK in 2003 as Yenilik İktisadı which sold quite a few copies; a small record for a scientific book in this country.

We met in Lewes Station and strolled around by Jackie's car, (he had difficulty walking with his crutches, which he had to depend on then) lunched in a Sussex Down's Pub, then visited old friends Dr. Oldham and Brenda in their country house. It was an unforgettable day in our life for my wife and me. Unfortunately, I will not be able to present my new book in Turkish, "Science, Technology and Politics, 2009" which was a kind of homage to my mentor, and scientific father, Prof. Chris Freeman. His death is an irreplaceable loss for the science policy community of the World.

I will always remain his loyal pupil...

2010-08-23

Ergun Türkcan, Professor of Economics (Ret.), Ankara University

Christopher Freeman obituary

He was a pioneer in science and technology studies

Mary Kaldor^(*)

guardian.co.uk, Wednesday 8 September 2010 17.55 BST



Christopher Freeman was remarkably prescient about the current crisis, arguing for growth that is sustainable economically and socially

Christopher Freeman, who has died aged 88, pioneered the subject of science and technology studies. Throughout his life, he was deeply concerned about the failure of social scientists, especially economists, to recognise the importance of technical innovation in explaining economic and social cycles. His work laid the basis for what could be described as a new school of neo-Schumpeterian economics – a set of ideas that are as important for understanding the current economic crisis as those of John Maynard Keynes were to the crisis of the 1930s.

One of Chris's most influential intellectual contributions was the notion of systems of innovation. In his view, new technologies are not isolated inventions. They involve a constellation of inter-related technological and organisational innovations. He proposed the concept of "national systems of innovation" to refer to all the elements – firms, universities and other actors, together with traditions, accumulated expertise and policy context – that produce technical change in each national economy.

This idea led to his enrichment of Joseph Schumpeter's theory of long waves and technology. He argued that distinct periods in economic history (around 50 years) are shaped by the bunching together of a set of technological innovations that profoundly reshape patterns of production and

^(*)Mary Kaldor is a professor of global governance and co-director of LSE Global Governance at the London School of Economics

consumption. In the early stages, the introduction of the new technologies and their diffusion display dramatic increases in productivity, but in the later stages are subject to diminishing returns. The introduction of what came to be called a new technological paradigm or style tends to be bumpy as the new technologies come up against institutional and social obstacles.

Chris was born in Sheffield and attended Abbotsholme School in Staffordshire. His studies at the London School of Economics were interrupted by army service during the Second World War, including a stint at Balmoral, guarding the royal family. He took part in the allied advance across Europe, where he witnessed the horror and devastation of war. While still at school, he had joined the Communist party and, like many of his generation, left after the Soviet invasion of Hungary in 1956. However, he remained committed to the Marxist idea that it was possible to uncover scientific theories of society and to combine theory and practice. In particular, he was greatly influenced by the work of JD Bernal on the nature of science and social science.

During the 1950s and 60s, while working for the National Institute for Economic and Social Research, Chris began to undertake detailed empirical studies of innovation in different sectors. This resulted in his first book, *The Economics of Industrial Innovation* (1974), a standard text in the field which has been republished in several editions and translated into many languages. Also during this period, he was the author of the report that led to the Frascati Manual, developed under the auspices of the Organisation for Economic Co-operation and Development (OECD), which set the standard definitions for statistics on research and development.

In 1966 he became the founder and first director of the Science and Technology Policy Research Unit at the University of Sussex. There, he developed a unique inter-disciplinary collaborative method of research. Indeed, the unit – with its teams of researchers working on issues such as informatics, energy and climate change, industrial innovation, development, food and agriculture or military technology – became the nurturing ground for a generation of creative people who continued his ideas and ways of working in other places. I was privileged to work at the unit during the 1970s and 80s and have been deeply influenced by what I learned there. We participated in ambitious projects such as the critique of the Club of Rome's report *The Limits to Growth* (1972) and its follow-on, *World Futures: The Great Debate* (1978), edited by Chris and Marie Jahoda. The unit continues to develop Chris's work, housed in a new building, the Freeman Centre, named after him. It also became the seed for several other similar centres, including the United Nations University centre in Maastricht, the Netherlands, co-founded by Chris and Luc Soete.

By the early 1980s, Chris was already arguing that we were experiencing the birth pangs of a new technological paradigm based on information and communications technology, destined to replace the late 20th-century paradigm based on automobiles and mass production. In the 1990s, Chris was writing about a new environmental techno-economic paradigm, where spending on environmental protection, poverty reduction and other global goods would supplant excessive private consumption as drivers of economic growth. In his article *A Hard Landing for the "New Economy"?* (2000), he was remarkably prescient about the current crisis, arguing that the diffusion of the new economy requires far-reaching changes in the institutional and social framework on a worldwide scale. The article ended with the phrase "fasten your seatbelts".

He argued for economic growth that is sustainable in an economic and social sense, not just an environmental sense. We need a new environmental paradigm because that is the only way we can achieve the productivity increases that will reproduce economic growth. In a brilliant short essay entitled *If I Ruled the World* (2001), Chris imagined himself as the first female president of the US, succeeding George W Bush, and laid out a programme for global recovery that included a new

family of global taxes, including the Tobin tax (levied on foreign exchange transactions and designed to discourage speculators) and the decriminalisation, regulation and taxation of recreational drugs, new rules for employment so that the mobility of labour can match the mobility of capital, new programmes for the environment, global security, health and education, and social redistribution, as well as investment in research worldwide. As he put it, all of these measures "are designed for practical implementation. All are quite feasible, but they are designed also to restore hope to the beleaguered world and, especially, to the wretched and poor of the world. To restore hope and belief in the future is the most essential measure in overcoming world depression."

Chris was an inspiration to everyone who knew him. He was modest and unassuming, shunning publicity and fame. His lectures were mesmerising – delivered clearly and simply without a single note. He was always kind and encouraging, especially to children and younger colleagues. He was passionate about football, cricket and birdwatching.

Chris had two sons and two daughters by his first wife, Peggotty Selson, who died in 1974, and a daughter by his second wife, Margaret Young. He is survived by his children and by Carlota Perez, his longtime collaborator and partner, whom he married in 2007.

Professor Christopher Freeman

Expert on the social and economic consequences of developments in science and technology

THE TIMES Wednesday, August 18, 2010, p.54

Last updated August 18 2010 12:01AM



Christopher Freeman won international recognition for his innovative work on the social and economic context of science and technology. In 1966 he accepted an invitation from Professor Asa Briggs, then Vice-Chancellor of the University of Sussex, to be the founding director of the Science Policy Research Unit (SPRU) at that university. Under Freeman's leadership SPRU became one of the foremost groups in the world undertaking studies of how societies can maximise the benefits from science and technology while minimising their harmful effects.

From the outset Freeman recognised the importance of building interdisciplinary research teams to undertake this work and always tried to employ both physical and social scientists to study particular issues. He was committed to studying science and technology policy in a global context, encompassing both industrialised and developing countries. During his tenure as director of SPRU, 1966-80, he considerably expanded the scope of SPRU's research and introduced masters' and doctoral programmes in science and technology policy and in technology and innovation management. After standing down as director, he continued to contribute to SPRU's research and teaching activities, and in 2001 the University of Sussex named a building after him (the "Freeman Centre"). This now acts as an international focus for the activities he started so modestly in 1966.

Freeman was a quiet, effective, inspirational leader, commanding loyalty from his colleagues and the support of many funding agencies. He took a great interest in the research of postgraduate students. Indeed there can be few science and technology policy groups in the world which have not benefited in some way from his inspiration as a mentor, lecturer and teacher.

He invariably succeeded in identifying what were the most important emerging policy issues in stimulating others, including funding bodies, to take an interest in them, thus bringing SPRU to the forefront of research in these areas. The research results generated by Freeman and his colleagues contributed to major public debates in many key areas and thereby to the wider policy-making process.



(L-R): Prof David Watson, Prof Ben Martin, Prof Christopher Freeman, Prof Howard Rush and Prof Alasdair Smith at the turf laying ceremony for the new Freeman Centre University of Sussex

Freeman's early empirical studies of technological innovation in different industries led to his groundbreaking book *The Economics of Innovation*, which was reprinted and updated several times. In this book he successfully demonstrated the key role played by technical innovation in economic competitiveness. He also led teams which undertook major studies on technology and employment and on social and technological alternatives for the future, the latter work (reflected in his book *The Economics of Hope*) providing an alternative view to that associated with the doomsday "limits to growth" models which had received wide publicity at the time.

Together with the Venezuelan researcher Carlota Pérez, Freeman built on the ideas associated with Schumpeter and Kondratiev relating to cycles or "long waves" of economic development which, they argued, stemmed from major new technological innovations, the most recent being the information technology revolution. Freeman coined the phrase "national system of innovation" to describe the institutions in Japan which had combined to make that country a major player in technological development in the 1980s. This concept was further developed by others but is still

the basis of much of the thinking and action on science and technology policy in both developed and developing countries.



• The Freeman Centre, at the University of Sussex, named after Professor Christopher Freeman

Christopher Freeman was born in Sheffield in 1921. His father, Arnold Freeman, was an early Fabian and a convert to the ideas of Rudolf Steiner. In keeping with Steiner's ideas about education, he gave free rein to his son's radical inclinations and thought the progressive style of Abbotsholme School in Staffordshire would bring out the best of his talents. While there Freeman and some friends, founded a Young Communist League cell and launched a radical magazine called *Schools Forward*. When he moved to the LSE, then evacuated to Cambridge, he quickly became a significant figure in the student movement.

He was much influenced by the ideas of J. D. Bernal, the Communist "sage of science", and never lost his early Marxist interest in the interaction between theory and practice. However, his well disciplined mind and realistic temperament did not permit him to succumb to ideological cant. Interestingly he actually enjoyed his posting to the royal bodyguard at Balmoral in 1944 when, as a staunch anti-fascist and an officer in The Manchester Regiment, he might have preferred an earlier posting to his anti-tank unit in Normandy. He was well aware of this social irony.

After leaving the Army in 1945 and completing his studies at LSE, Freeman worked first for the Post Office and then joined the London Export Group, helping to find markets in the UK for Soviet and Chinese products. Later he was recruited by the National Institute of Social and Economic Research to work on a series of projects studying innovation in different industrial sectors. He was also engaged as a consultant to the Organisation for Economic Co-operation and Development and in 1963 became one of the leading authors of the so-called Frascati Manual, which set the standard definitions of research and development used by successive generations of statisticians in national statistical offices.

Even in his early postwar career when Freeman took some time to develop his early Marxism into a more sophisticated approach to science and technology, he was always pushing the frontiers of significant research with that combination of charm and intelligence that made him both likeable and effective. He broke his connection with the Communist Party when the Soviet Union invaded Hungary in 1956.

Freeman was a staunch supporter of Sheffield Wednesday Football Club and Yorkshire County Cricket Club, and he was a keen birdwatcher.

He had a strong belief in the ability of people to mobilise technology for the benefit of all humankind. He will be remembered for his great optimism, his modesty, his inspirational encouragement to young people and his ability to recognise only the most positive qualities of all his friends and colleagues.

Freeman married first Peggotty Selsun, who died in 1971, secondly Margaret (Maggie) Young (marriage dissolved) and finally, in 2007, Carlota Pérez. She survives him, together with two sons and two daughters from his first marriage and by one daughter from his second.

Professor Christopher Freeman, science policy guru, was born on September 11, 1921. He died on August 16, 2010, aged 88