Sir Iain Gray

Interviewed by

Jane Bird

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By Zoom

Welcome to the Archives for Information Technology where we capture the past and inspire the future. It's Friday 19th January 2024 and we're talking on Zoom, *as has become customary since the Coronavirus pandemic. I'm Jane Bird and I've reported on technology and the IT and telecoms industries for newspapers such as* The Sunday Times *and the* Financial Times *since the early 1980s. Our contributor today is Professor Sir Iain Gray, Director of Aerospace at Cranfield University. Sir Iain spent more than thirty years in the aerospace manufacturing and engineering sector, ultimately leading Airbus in the UK. He also led the UK government innovation agenda as chief executive of the Technology Strategy Board. He was responsible for an annual budget of £500 million and interacting with some 5,000 large and small businesses across all sectors. Sir Iain holds board memberships and non-executive directorships at various organisations, including universities, tech companies and engineering professional bodies. He's a recognised leader across the UK's engineering innovation landscape. Welcome, Sir Iain, I'm very much looking forward to hearing more about your life and experience in the world of aerospace and technology. So, if we could start at the beginning then? You were born in Manchester, but your family then went to Aberdeen, I think, is that where you spent your childhood?*

Yeah, I very much treat Aberdeen as my kind of home town. A quirk of fate, my mother and father met each other at St Andrew's University as graduates and my dad's first job was in Manchester, and so I was born in Manchester by virtue of him doing his first job there, but my memories are, you know, early school days, school days, university days are all Aberdeen. So I very much treat myself as an Aberdonian. But actually, you are right, I was born in Manchester.

So you were- did you have any siblings or are you an only child?

No, I've got two sisters. My dad's ambition was that I be an engineer, my younger sister be a lawyer and my third sister be in the kind of medical profession. And it turned out I am an engineer, my younger sister is a lawyer, but my third sister became, went into IT and technology specialisms, as it happens. So, yeah, two younger sisters.

So you had, because you had quite a sort of a bit of a background in engineering and technology, I think, didn't you? Your, was, your maternal grandfather was a civil engineer and your father obviously was an engineer as well.

There's definitely a bit of engineering in the family heritage line. My father was an aerospace engineer and I suppose like a lot of fathers he wanted his son to become an aerospace engineer. As a young person I was always very keen on aerospace, although I wasn't always convinced about aerospace engineering, but in the end he got his way and I very much followed his footpath, footsteps.

So you're a bit of a golden, a good boy then, doing what your father wanted. Did you have lots of parental encouragement then when you were at school?

More a subliminal encouragement, I would say, you know, a mother whose adage was, you have to let go of your children and allow them to develop themselves and then come back and be part of a family, a father who was very keen to ensure I had the opportunities, but it was my responsibility to take advantage of those opportunities. But he was, you know, forever taking us to airshows and things like that, and so that career that I ultimately followed, I owe an awful lot to my father in terms of getting me into the industry.

You mother was a teacher, of course, wasn't she, so I suppose there was quite a strong sort of educational emphasis as well through her, presumably?

Yeah, she was a languages graduate by background and… but yeah, teacher, brought its own kind of disciplines into the household and… But yeah, very supportive parents and very keen that, you know, that we'd find our own way in the world, but adage of giving us the opportunities to develop ourselves.

Yeah, but by the sound of it, not pushy parents?

Not pushy. Great parents. Sadly, neither of them with us any more, but huge, huge influence on my career and my life and an awful lot to be grateful for.

[00:05:09]

What about your schooling? So you went to the local schools, to the quite local primary and the grammar school and so on in Aberdeen?

Yeah, very fond memories, particularly of my early schooldays, primary schooldays. I was very fortunate, I think, in that I went to a brand new school, newly opened, newly built, started in, I was in the most senior year at that school for three years running and it gave you a sense, an early sense of responsibility and leadership that quite often in a primary school you don't get until you're at that very final year, and some great opportunities came along. I was the last of the eleven-plus generation up in Scotland, but went to Aberdeen Grammar School and spent six very happy years, lots of friends. Coming out of that developed all the basic science and mathematical skills that have been invaluable for me throughout my career. But yeah, some very happy memories of schools in Aberdeen.

Did you have particularly inspirational teachers or mentors at school?

Yeah, like everybody, you kind of remember teachers for different things and some of the teachers you remember as being really hard taskmasters that perhaps you didn't totally get on with at the time, but now when you look back on it you recognise just how much they were valuable to your career. And other teachers, I mean one of my teachers, my chemistry teacher, sadly passed away the other year, but a guy called Daisy May, that was his nickname, Daisy May, was in the category of a friend for life, you know, kept correspondence going with, you know, right through, right through until his eighties, kind of thing. And that was a kind of, the kind of approach that I really welcomed. You had relationships that were educational and professional, but you also developed friendships with teachers that became lifelong friendships.

It's the kind of school where teachers stayed for a long time then, by the sound of it, rather than moving from school to school?

Yeah, I mean quite whether it's like that right now or not, I've lost a little bit of touch. But you're right, I mean the teachers that were there were very loyal to the school,

very loyal to the subjects that they were partisan to, and to the pupils. So yeah, absolutely, really good synergistic relationships.

So then you went to university in Aberdeen as well, I think, to do engineering, is that right? So you stayed in your city?

I did, which is not unusual actually, in Scotland. You tend to go to university a year younger in Scotland than you would do in England, whether that's the root cause of that particular aspect of culture or not, I don't know. But it was a lot more common to go to your home university than perhaps in some of the English cities. I applied for a couple of universities: Glasgow, St Andrew's, I think, but Aberdeen was where my friends went, Aberdeen did the course I wanted to go and do, so it seemed very natural just to, you know, carry on my schooling and go to Aberdeen University and very proud of my relationship. We had an alumni reunion event just last year, actually, with classmates and, you know, tracking all our respective careers and career lives, but you realise just how close some of those friendships that you made at university were, both in a social and a professional sense.

So quite- did quite a lot of people at that time then stay living at home with their parents while they were at university?

Yes, I would say that was not uncommon. The slightly different thing maybe about Aberdeen as a home university was it was the most northern university at the time, so as a home university, its catchment area did include students from far north-east Scotland that were 150, 200 miles away, so there was a, the term home university was maybe slightly different from in the Home Counties or…

Yeah.

But yeah, by and large, I mean most of my friends certainly spent the first couple of years living with their parents in Aberdeen. I spent my entire university career living at home with my parents, although there were many months, I would suspect, went by without me really seeing them or being part of the dinner table conversation.

[00:10:26]

Right. So didn't cramp your style at university then?

It definitely did not cramp my style, and again, it comes back to the, you know, the approach my parents adopted, which was give me all the enablers that allowed me to develop my own way in life.

Yeah. So then you got a job with British Aerospace, that was a sort of graduate traineeship or something, was it?

Yeah, that was straight out of university, it was through their graduate recruitment programme. I mean like a lot of graduates at the time, the milk round concept of companies coming to the university campus looking for the graduates. But British Aerospace was, you know, a company I'd- I mean it was the foremost aerospace company in the UK, so if you had determined that you were going to go into a career in aerospace, it was one of only two or three real options you pursued at the time and the bigger question was which part of the company did you want to be involved in, which part of the country did you want to move to. And so I did join British Aerospace and I quite explicitly selected Bristol as the site that I wanted to go and do my graduate training at.

Because it was about as far away from Aberdeen as you could possibly get at that stage in your life?

Yes, I mean if you're joking and cynical about it, it was the furthest away from Aberdeen and I'd never been away from home, therefore it was good. And B was quite early in the alphabet as well, so I didn't have to do too much searching around. But on a slightly more serious note, the thing that really convinced me to come to Bristol was the involvement Bristol had had in the Concorde project, and it was Concorde in the end that kind of really drew me into the aerospace industry.

Ah, okay. Because I was going to ask you, yes, we leapt through university a bit quickly in terms of were your tutors and supervisors and so on at Aberdeen keen for

you as well to… did they suggest that you joined British Aerospace and take that career route? Did you have mentors and inspirational people who influenced you at university?

Yeah, I wouldn't say they shaped my career decision. They maybe shaped my kind of discipline interest. I did what was called an engineering science degree at Aberdeen University. At the time I think there were only two or three other universities in the UK offering an engineering science degree, and effectively that allowed you to choose which of the engineering sectors you went into and you could specialise in certain areas. And so my specialisms tended to be more on the structures, the aeroelastic structural dynamic side, and I can remember to this day, at one of the lectures, a picture one of our structural dynamics lecturers put up of an aircraft wing and all the wiring and strain gauging and everything that was on it, and thinking, wow, that looks, you know, pretty impressive, that looks really good. But no, I'd say the lecturers were very influential in the subjects that I chose, a lot less influential in the companies and the career direction that I chose.

[00:14:18]

And as we're, you know, talking to an organisation which is very focussed on computing technology, I should also ask you whether, you know, you were using computers at this stage, presumably were you? What was your first encounter with computers and what did you think of them?

I think Aberdeen was quite progressive, actually, on the computer side. But, you know, my first memories, I mean the huge new computer buildings that were being established on campus, which were, you know, the benefit of hindsight, huge buildings put in place which you could probably now house within a little shelf on a rack in your office. But, you know, we did get involved in control theories, we got involved quite early on in Fortran programming. I did, one of my sort of design projects, thesis projects was writing computer programs related to the other disciplines I was involved in. So there was quite an early introduction into computing and the computer science department. Because it was an engineering science degree,

I did, we very much got into some of theories and the basics of computer technologies and computer programming.

Right. But you… that didn't seduce you away from your focus on aviation and aerospace?

Um, no, it influenced from an application point of view how I saw computers, how I saw computer technology applying into the aerospace sector, and of course, you know, computers has been one of the big enablers of the aerospace sector for, you know, four or five decades now. So the influence was more the application of computer technology into the aerospace sector, as opposed to saying I want to go into the telecoms industry or- which could have been an option, a number of my, a number of my friends doing my engineering science course would have gone in that direction. But I probably always saw myself more in the application side of things than on the computer science side of things per se.

Yeah, okay. So when you arrived at Bristol then, how did you find it?

As a city I loved it, you know, I'd never been to Bristol in my life. Quite a cosmopolitan city, I think it's developed an awful lot in the time I have been here, but I loved it. The industry itself, well I said a few minutes ago that Concorde was one of the things that attracted me into the business and here we were at Filton, we still had the final Concordes in manufacture, we'd some huge test facilities related to Concorde, it was like a dream come true for me.

So, that must have been a bit of a blow when the project was, when Concorde was abandoned, presumably?

Yes, and no. I mean I could see it coming. Technically, I have been a lifelong enthusiast on that particular aircraft, in fact I had the very good fortune of leading a team which was in charge of product support for Concorde, I had a period in my career where I was responsible for the development of a potential successor to the Concorde. But all of that was against a backdrop of knowing the downsides, whether it be how does it make sense in a commercial sense, what's the business case,

what's… how do we comply with the ever more stringent and involving, evolving environmental kind of conditions. So yes, it was a disappointment, but it was one you could foresee, you could foresee coming and one I was just ever so grateful to have had the opportunity at that time in my career to be part of.

[00:19:01]

Right. So what else do you remember about that period, because you were there until in 2007, that's when you became managing director and general manager of Airbus UK, I think. So in that first- so that was from 1979, that's…

Wow.

Thirty years, yeah. What else do remember that was…

You know, the evolution of the aerospace industry, the, you know, UK's involvement in the Airbus programmes, things like that. The ever increasing, you know, complexity in the design of projects. Concorde was incredibly complex, but in many respects it was designed at the time of, you know, much more simplistic tools and things that were available to the engineers, you know, the optimisation processes. I mean in the context of computing and computer technology, you know, you can look at computing technology both on the product itself, that evolved enormously over those 30-year period, but also the use of computers in the design, the support, the manufacturing process. And, you know, I very well remember my first jobs preparing a deck of cards, stack of cards, you'd leave outside your office to be collected by a bureau overnight. You'd go in first thing in the morning to see what you had back from the computer and five times out of ten you had a job failed because you'd typed a card wrong or something like that, you know, those kind of frustrations. All, you know, part of that evolution of computers used within the business itself.

Yes, absolutely. So, yeah, anything else you remember as, I mean high point… I mean when was it that Concorde was abandoned and did that sort of, did you just, how did you move direction after that, what was the company…

Concorde's final flight was November 20th 2003. I know the date, it's etched on my mind. Concorde, the final production runs were probably, final production was early to mid-1980s. So in terms of highlights of my career when I was in Aerospace and Airbus, it was probably my period working on the A380 project, the double-decker project. I was head of engineering at the time in Airbus in the UK when Airbus made its maiden flight, 27th April 2005, that was the culmination of ten years' engineering effort and, you know, to be part of the team to see that aircraft successfully take off and fly probably is the highlight of my engineering career to date, it was just a magnificent, a magnificent moment, that culmination of all of those years' engineering efforts.

Yeah. I mean obviously you have a very enormously highly valued set of skills because you've got your engineering and technology capabilities and then clearly, leadership, these leadership qualities. Is that something that came naturally to you, to sort of take the reins and to start, you know, really being, wanting to be in control, were you always quite keen to be a leader?

No, I wouldn't say I was, I wouldn't say I was always like that. I mean I would say there's always been an element of wanting to be in control of your own destiny and what you do. I think I, you know, I learnt a lot from people. I was very lucky to have some excellent, let's call them mentors, they probably weren't necessarily called mentors in those days, they were some of the older more senior engineers that I'd learned to respect who would sit down with you, provide career advice. Both technically and managerially I would say one of my strengths has always been the ability to get on with people, to try and find a common position between sometimes differing views, differing positions, and that's something I think I've always had naturally. But from a management and leadership point of view, I've received lots of good advice, lots of tips. The best advice I ever got was don't change yourself, you know, just be who you are and recognise your strengths, your weaknesses, work to your strengths, get others to help you overcome some of the areas where perhaps you have development needs. So that kind of ethos has worked very well for me.

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So, a degree of humility then, along with the kind of the confidence of being, wanting to seize control, as it were?

I've heard others say that. I, you know, you are who you are and you do what you can do and getting on with people is my kind of trait. But there are, you know, I have had the good fortune to work with some brilliant, brilliant people and not necessarily just speaking about good engineers, you know, good administrative staff, good team staff, you know, people that kind of just in adversity roll their sleeves up and get on with doing things. And I think one of the other tips I kind of picked up on really quite early on in my career was to look for the positives in everything that you do, because let's face it, in your career there are things that are really enjoyable and a real high point, there are things which actually are the drudgery, the kind of everyday things, and that kind of, look for the positives, even in those much more mundane and… mundane tasks. I think was a tip somebody gave me early on and I remember it being as mundane as somebody saying to me, hey look, when somebody asks you to go and photocopy something for them at the machine, you know, make sure you have a wee read of it as you're going to the machine and understand it, and when you get back, ask a question about what you're just read, and learn that way. So you're always looking, always looking for the positive and what can I learn from this, no matter how small, mundane, whatever task you have. And then when it comes to the big stuff, yeah, you know, you're much more willing to ask some of the naïve or the difficult questions that sometimes people aren't quite so willing to ask because they're scared it exposes their own weaknesses.

Yeah, yeah. So how did life change then when you became managing director of Airbus UK?

Well, you have a responsibility. Responsibility at all levels, but you suddenly have a responsibility for many thousands of people, mouths to feed and there's a social responsibility angle which was different. There was much more of a corporate strategic angle to the job, so you're not just thinking about the next six months, the next twelve months, you're trying to position the business on behalf of all your

employees to protect them for the longer future. And I guess the other thing, which doesn't necessarily come naturally to me but is an absolutely integral part of the job, is putting yourself outside your comfort zone in terms of communicating to the outside world, being, you know, being the person that is the face of the organisation, for good or for bad. And it isn't always for good, you know, you have to be in a position where you can take the rocks as well as the good stuff.

What did you, can you remember which challenges you found sort of particularly tough from that point of view, difficult things that you had to deal with?

I can think of, you know, one or two. It's difficult to describe some of them without getting into, even now, what might be commercial sensitivities. But in that period, the UK aerospace industry was going through a fairly significant rationalisation and reorganisation. I think the UK in my perspective lost its way a little bit in terms of, not necessarily the number of companies involved or the number of jobs involved, but it started to slip down the tree a little bit in terms of we no longer made overall aeroplanes, we no longer did things. So the control started to slip out of the UK a little bit more. And that was tough, because suddenly you're trying to position, in a multi-national company, you know, represent the voice of your employees in the UK, in an organisation that's much more of a global organisation and the UK's only part of it. I found that really quite tough. I always wanted to wear my Union Jack on my sleeve and promote the UK interest and sometimes that wasn't always the direction that the business was going in.

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Yeah. So there potentially could be conflict there if you recognised that globally it didn't make sense to do things in the UK, which in your heart you would have perhaps wanted to stay here.

Yeah. And, you know, I'm not the first and I won't be the last person that feels that, that conflict. And, you know, your question about what do you feel differently when you're in that position, it is finding a way of managing those conflicts, because there's a part of you that forever wants to support the softer parts of the business agenda and

there's other parts of you absolutely recognise the business imperatives of being a global leading business. So that's a tension.

Absolutely. So, is there anything else, do you think, to say about Aerospace, British Aerospace or shall we – Airbus and British Aerospace – or shall we move on to talk about your work at the Technology Strategy Board, which I think you became chief executive of in 2008?

Seven, I think, but... Probably gave you the wrong… I must have given you the wrong date, Jane.

Anyway, about…

No, we can move on. I think that's been a good conversation, if you feel comfortable that you've teased out the kind of things that are relevant.

I think so. I mean I think, yeah, it's just, well, perhaps just a little bit more. Aerospace generally, obviously the UK, was a world leader, did you feel that, you know, have we sort of lost our position there? You touched on that a bit. And what, you know, what you think perhaps might have been done differently or whether we went wrong, or whether that was all inevitable?

I think, I think we could have done things differently. I have a very strong picture in my mind of one of my very first visits to Toulouse and there was, I was in one of the factory hangars and as it happened there was a little floorplan of what the Toulouse factory looked like in, let's say 1975 or something like that, and in comparison it showed you what the equivalent factory of Bristol looked like in 1975. And, you know, when you looked at it, the two were pretty similar, they'd both been involved in projects, they'd both been involved in the early development of, you know, what is now the leading civil aviation business in the world. But alongside that picture there was a vision of where France wanted to take its industry, and I think the UK could have, I think the UK gave away what was a potential very strong leadership position by a lack of joined up government thinking at the time, potentially a conflict between the direction that the country wanted to go in terms of its respective relationships with

the US and its respective relationships with Europe. And I think, I think, you know, without getting into macro politics, I think at the aviation, commercial aviation level, there was a period where we backed the wrong horse and a lot of decisions went the wrong way for us in the UK. And there's no doubt about it, the UK still has a very, very strong role to play, but the bit that I feel we lost was that overall aircraft leadership and integration level, and at a commercial level I think we have always as a country under-estimated the influence of the geographic location of where a board is located, and we allowed boardroom decisions effectively to take place outside of the UK. That would never have happened in France.

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No. So was that part of your reasoning for moving on then, to pastures new in 2007?

It was a contributary thing. I think I'd also reached a point, highlight of my career, as I say, was the first flight of the A380, I stayed with the A380 right through to its entry into service with Singapore. The next big new project that was going to come along was going to be another ten years and, you know, if you're going to move in your career, you need to move at a point when you can make a difference and do something different. And so for me there was a very logical decision point in my career that I did want to try and do something else. There was a potential, let's call it domestic priority clash, my wife didn't particularly want to move to Toulouse and the company very definitely was headquartered in Toulouse. If I wanted to have a senior position, I needed to move there. So a combination of wanting to try and do something a little bit different, to try and demonstrate to myself I could do something different combined with those kind of pressures, it was the right time to move. So 2007 the opportunity came to lead what was a new organisation in the country, called the Technology Strategy Board at the time, now called Innovate UK. And, you know, that opportunity to be the first chief exec of a new government-funded organisation I found very appealing and I had a terrific seven, eight years at Innovate UK, Technology Strategy Board, and have no regrets whatsoever for moving.

And what were the highlights then?

I guess two different dimensions of highlights. And one was actually getting involved in other sectors. So the aerospace industry was wonderful, it was great, always thought it was very special, and you suddenly realised the transferrable skills that went from aerospace into healthcare, into energy and into automotive. You know, just to see those transferrable skills. I remember my first four weeks at the Technology Strategy Board, I had two meetings, one was up in Glasgow actually on some work related to the prediction of blood flows through prevention of blood clots in the brain and things, and lo and behold, they were using Airbus A380 software to predict the flow of blood. I then had a second conversation with Lloyds Register and from an insurance point of view, and they were very much looking at the, you know, their predictive techniques for storms and things like that, and again, lo and behold, it was, you know, they were using aviation kind of software to do that. So that recognition that actually, aerospace, there were a lot of transferrable skills that could go into there and bring my experience, and learn back in the other direction, see what was happening in other sectors, how that came back. That was a real highlight. And I guess the other real highlight…

That software was presumably aviation software to do with what, modelling the airflows over…

Yeah, modelling the airflows, was exactly the same kind of specification requirement that was needed to predict the flow of, you know, blood through the various veins leading up into the brain and… I mean it was just fas… it was almost serendipity that within those first few weeks here I was in two completely different sectors but hearing the same kind of technology side of things. But no, the highlight was kind of getting to know and to understand the different sectors and from a technology, from a tech point of view, again, those transferrable skills that kind of, you know, tech UK, technology has applications right across those different sectors, so to see how, you know, where you could learn from one sector into another, apply it into another, that was a highlight. And the other highlight was I guess a slightly different look at things, but it was aerospace does tend to be driven by the large companies, and my exposure to the innovation, the entrepreneurial, the small business sector, you know, whether that be on the tech side, whether it be on, you know, other ideas, that exposure to the start-up community, the enterprise hubs for networks in which they

operated, the challenges they had, both from a financial and a delivery point of view, the cultural differences. And so to spend seven or eight years immersed in that kind of innovation, entrepreneurial community was amazing as well.

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And that's obviously something that you've kind of continued with in your non-exec directorships and board memberships and so on, I guess, since then?

Yeah, so that exposed me to a different community and it made me (a) realise that I had something that I could offer back into that community, but (b) that I could live and breathe and- on the excitement and the enthusiasm and the, you know, the dynamism of small start-ups that many big companies constantly trying to emulate and find ways of emulating.

I realise I forgot to ask you as well about your doctorate, which you did at Southampton University, I think, didn't you, while you were working in Bristol?

Yeah. No, I did a Masters at Southampton.

Masters.

A lot less affinity, actually, with that. With the benefit of hindsight, the company sponsored me to do that and very much did that from a retention perspective, it kept me in the company when I was probably at a point where I was starting to look at, well, are there other options. And so again, you know, just from a personal development point of view, there are two aspects to that Southampton experience. One was the educational aspect and what I learnt and what I did there, but the other was that kind of behavioural aspect of the constant need to try and find the right moments in time to incentivise people, what does incentivise people, and it isn't always money, you know, it is about development and lifelong learning and meeting new people and doing things. So Southampton was very good for me in that regard. It introduced me to people who I still connect with today: Professor Sir Peter Gregson was a key influencer in my career and I met him while I was doing my Masters at

Southampton. So, you know, I learnt and met new people, loved it. But I don't have quite the same affinity in a Masters degree sense as I had with my undergraduate university.

Okay, so after, so then after your time at what became Innovate UK – I don't know, why did they rebrand it? Just because they thought it needed a new name?

Yeah, I mean long story short, I think Technology Strategy Board – TSB – had a counter, Trustee Savings Bank, everybody would make a joke about that. And it didn't really say what it was doing on the tin. So it was rebranded as Innovate UK and that stood the test of time. With Innovate UK we came up with the notion of the Catapults and the Catapult Centres still stand, they're growing, I mean they're all £100 million kind of businesses in their own right. But the innovation landscape, all the knowledge exchange, knowledge transfer partnerships, knowledge transfer networks, all those kind of initiatives. I think Innovate UK gave it a broader umbrella than the title Technology Strategy Board.

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So you think it has worked then, do you? Because it's one of those notoriously difficult things, isn't it, for sort of civil servants or public sector bodies or whatever to try and pick commercial winners and to identify, you know, which companies are really going to make it big.

Yeah. I mean there was an adage we used to use, which was, you know, it wasn't about picking winners, it was about picking races and which races the UK should be in. And then structuring facilitated conversations or network grants or things to help companies within those chosen races to compete. And I think, I think it has been successful, I think there's some remarkable success stories that Innovate UK themselves can tell. It's a long term, a long-term game and of course inevitably there will be failures along the way as well and that whole ethos of failure being a positive metric, and everybody talks about the Californian culture where failure is treated as part of a journey, failure is a positive metric. And so there is that kind of, you know, there is that notion in the UK of failure's not an option, kind of thing, but there's so

much you can learn from an innovation enterprise sense, people fail, start up again, keep going. I think there's some really, really good big success stories that have come out of Innovate UK. I loved my time with it and some of the business connections I made then are still very, very close business connections,

So then you moved on to the world of academe at Cranfield.

Yeah, yeah. So I'm not a lifelong academic and probably not your archetypal academic either, and the university I'm at, Cranfield, is probably the right kind of university for me. It's a, you know, it's a very industry-led, industry-focussed university, a postgraduate only university. But for me, one of the things that I had seen, you know, when I was at Airbus we were forever trying to develop strong partnering relationships with universities and we always treated universities as just like another part of our supply chain and didn't fully understand what a university was all about – I'm over-simplifying. When I was in Innovate UK, I mean Innovate UK was a business-led, university-engaged kind of initiative, unlike the research councils which are university-led and business-engaged. But I learnt, you know, a lot about that triangle – universities, government, business – all working together, and it just seemed to me quite natural, having spent my time in industry, having learnt all that through Innovate UK, to throw my hat in the ring and try and join up the industry, academic, government network. And so I joined Cranfield, I was given the opportunity to go in at a relatively senior level at Cranfield as Director of Aerospace to shape the strategy of the university around the aviation aerospace agenda, and also with a significant budget, profit and loss accountability for one of the biggest centres in the university itself, and I've been there eight years.

And how have you found it?

Fantastic. I, you know, love the positive engagement with young people, young people with ideas, with aspiring professionals, people that are going to go on and become the leaders of the business. I've loved the opportunity to be at the sharp end of a sector which is changing quite dramatically through both technology opportunities and things like environmental challenges, but the concept to be at the forefront of some of the autonomous technology work, the work about drones, about

eVTOL – Vertical Take-Off and Lift vehicles, the opportunities to be involved in the very early thinking around battery, battery electric aircraft, about hydrogen, hydrogen fuel cell, liquid hydrogen aircraft. So, you know, it's a rapidly changing set of technologies. And I would say it's a sector that has started through those technologies to embrace the role of start-up companies and, you know, graduates, young business people can set up businesses in those kind of sectors in a way that perhaps they never could in the seventies, eighties, nineties. So, you know, the university's been at that kind of very leading edge, forefront of both a cultural change, a technology change and the environmental challenges the sector is facing up to, it's a very responsible sector to those challenges and right through my career environment's been pretty close to top of the agenda. It is now absolutely top of the agenda and the 2050 goals, the universities have a huge role to play in ensuring both the social and technological changes necessary to meet those goals can be achieved. So Cranfield, yeah, it's been incredibly exciting for me.

[00:50:49]

And I'm interested you say that it's perhaps easier for young people to form start-ups and spin-offs in these advanced technological areas now compared with the past, because on the face of it one might think it's actually, you know, more difficult, more expensive and so on. Can you expand on that a little bit? How are those costs…

I mean I wouldn't – let's not belittle the financial challenges or commercial challenges. I think the thing that makes it easier for the opportunity to arise is the fact that, you know, traditionally aircraft, aircraft manufacturing in particular, is a supply-driven initiative, so if you wanted to set a company up, you set a company up that would sit within a supply chain controlled and managed effectively through the large Primes, you know, Boeings, Airbuses, Rolls-Royces, Safran, GE, Thales, etc. And so if you were to set a company up twenty-five years ago, you really, your opportunity was to set a company up that could exist within a supply chain. That's hard, there's hard margins, very high expectations in terms of deliverables. When you now look at things like drones and you look at Vertical Take-Off and Lift concepts, or small hydrogen fuel cell projects, they're smaller entities and you can, once again, have a vision that you sit at the top of that supply chain in your own right. So the

entrepreneurial aspect is, let's do something different, let's set up a, you know, hydrogen fuel cell business, we're not head-on competing with the Airbuses or the Boeings of this world. It doesn't take away from the challenge of raising money, of hitting milestones, but you're a lot more in control of your own destiny than that traditional mega-supply chain kind of environment.

Yeah, yeah. Okay, that's fascinating. So should we talk a little bit more about your other activities at the Bristol Aerospace Museum you're involved in, and the graphene company, Versar… what's it called? Versarien.

Versarien, yeah. CFMS and, yeah, I'm happy to talk. I mean I'm speaking to you today from within Aerospace Bristol… [brief sound dropout - 00:53:43-00:53:47] in Bristol on the site of what was the Bristol Aeroplane Company. We've been open five years, I'm the chair, we're telling the story of Bristol aerospace from a technology point of view, a tech point of view. I mean Bristol was at the forefront of a lot of the early space work we did in the UK, it was at the forefront of a, you know, a lot of the very early computer development activities. Concorde itself was one of the very first products to have computer technology applied on the platform itself. So we're telling those kind of stories and, you know, I've been chair of Aerospace Bristol from well before the museum itself was opened. We're now a very successful part of the Bristol tourist agenda, but telling that technology and people story around the Bristol Aeroplane Company and it's… and looking into the future as well.

[00:55:02]

Right, yes, we need to do a little crystal ball gazing before we close.

We certainly do, yeah, we certainly do.

But before, so how about graphene, the world of graphene, that's obviously another thing.

I mean graphene's an interesting product. Versarien was actually one of the companies I came across when I was working at Innovate UK. Graphene, you know,

the world's strongest material, graphene celebrates its ten-year anniversary this year actually, 2024. Graphene is one of those materials that has both electrical conductivity properties, strength properties that present great opportunities. But like a lot of materials, you know, there are qualification aspects, there are market aspects, it takes a long time for a new material, a new idea to become successful in the marketplace. And Versarien is, you know, inching its way in terms of product development, focussing around things like textiles and focussing around graphene in concrete, giving it additional strength properties, but ultimately will end up in very hi-tech products in aerospace, in communications, electrical devices, liquid… LCD kind of displays. So Versarien's got endless possibilities and Versarien is one of those companies pushing the boundaries of where those applications should be. But it's a, you know, a company that's had a clear vision of it needs to address short-term markets as well as positioning itself for those long term. It's not a university, it's a business and needs to find where its markets are now. And that again, you know, is where my Innovate kind of experience comes to bear.

Indeed, yeah. Well, that's obviously one to watch. And then CFMS is a digital engineering consultancy.

CFMS is a digital engineering company, it's a small company based on the Bristol and Bath Science Park. It's been a custodian of its own high-performance computer, a Cray, for some five to ten years, so provides, you know, a computing service to many of the companies around aerospace, energy sectors. Increasingly, it's a company that's providing digital capability around things like artificial intelligence, the application of artificial intelligence into all kinds of applications from city, city planning, into space, into aerospace, automotive factory design kind of concepts. So it's a business that's slightly repositioning itself from just providing computing capacity and computing support into an engineering, a digital engineering – you used the word consultancy – but a digital engineering company in its own right.

That's it. And does it have clients globally or it is very much still UK-focussed?

It's mainly UK-focussed. A slight oxymoron in that there's very few UK companies that don't have some global dimension to it. So implicitly it's involved in global

businesses, but it's predominantly UK oriented. Close connections with universities, close connections with some of the innovation landscape, and its key clients include some household names as well as some smaller entrepreneurial new upstart kind of businesses. So a very exciting business to be part of.

[00:59:31]

Yes, because your background, obviously you have been in the UK for all of your professional life. You mentioned about, you know, in the end deciding not to go to France, and I don't know whether you ever considered going to work in the US. So how do you feel about the UK? Did you ever want, did you ever think I need to go and have the international experience, or did you feel you could have the international experience from the UK, and now do you feel that the UK is either sort of more outward looking, or perhaps, you know, we've got problems? How do you see it?

So, you know, I mean the UK's part of a global village, but UK, I think there are big opportunities within the UK itself. I think it depends what opportunities come your way and what opportunities, you know, fit with your own kind of desires and objectives in life. Do I regret not spending time in the US? I think I've been in the very fortunate position that I've had many business transactions in the US, I know many people out in the US, there's part of me would have loved to have spent a year, two years out there. I did spend quite a bit of time in Europe, in Germany, I spent six months in Hamburg. I know, I knew Toulouse very well, so even though I didn't want to move my family there, I knew Toulouse very well and spent a lot of time in France. I would, I would, I would counsel people if they came to me for advice to really consider very carefully if they got the opportunity for an overseas placement or an overseas assignment to take it, to consider it very seriously. I think it for me is one of the shortcomings of my own background. But I've been in the fortunate situation that I've compensated for that in other ways.

Yeah. Well, you have, obviously had, in one sense the whole of aerospace is international, isn't it, so you've obviously had to…

Exactly, exactly.

Yeah, yeah. And you've got a whole string of awards. To list all the fellowships you've got and the honorary doctorates and so on, goodness me, you know, a CBE, a knighthood. Obviously your… I mean, what would you say your proudest achievements are?

At different phases in my life I would say different things. I think sat where I am now, I mean last year I was in the very, very privileged position of receiving a knighthood, received it from Prince William at Windsor Castle, and it's got to be one of the proudest moments of your life when you receive an award like that. But at the other end of the spectrum I'd say, you know, ones I'm very proud of, one you didn't pick up on and perhaps not many people would even be aware of it, but what was called the Baird of Bute Society Award. The Baird of Bute Society Award is an award named after Andrew Baird, and Andrew Baird was a blacksmith that lived on the Isle of Bute, accredited potentially with the first heavier than air flight in Scotland. But an award which is all about trying to raise the awareness of engineering and STEM or STEAM-related career paths to young children on the west coast of Scotland. And the Baird of Bute Award I received was a recognition of my contribution to the aerospace sector from a Scotland perspective, and, you know, I was enormously proud to receive that, and I'm enormously proud to be associated with that, because that wasn't just an award that you received, it was something that is part of an organisation that is promoting engineering, technology to young people in a part of the UK that perhaps is less exposed to those opportunities. So yeah, that was great. So, you know, you go from the big awards to sometimes the smaller, but much more meaningful. I've been very privileged, all the honorary degrees I've had at universities, you know, it draws you into their community. They've all been nice events in their own right, but probably what's been nicer has been those universities that have particularly followed up on an honorary degree and engage you in their alumni events, engage you in the communication and what's going on, and make you feel part of that community moving forward. And so those have been incredible experiences as well.

[01:05:09]

Yeah. So, shall we talk about the future a little bit now and looking into your-making, I know it's always sort of, no one wants to make predictions necessarily sort of too specifically, but how do you see your part of the world changing in the next ten years, what do you think are likely to be the most significant developments, perhaps positive and negative?

Yes, I mean it is a changing world and there are things I worry about and the things I'm really excited and positive about. The things I worry about tend to be a bit more on the social and the ethics side of things. You know, without sort of jumping on the bandwagon of people's concerns around ethics, there's got to be concerns and issues around how AI is part of our community going forward. It's got to be where does, you know, autonomy stop and start in terms of what we want in terms of driverless cars and pilotless aircraft. There's that kind of social and ethical side. I do worry that post-Covid, you know, for all the technology enablers that have developed through Covid and subsequently since Covid, and this interview's a, you know, a great example of us now just taking for granted things like Zoom and ability to do that, but how many young people seem to have lost the art of communication and I think the unintended consequences of that are something we should worry about. So those are kind of negatives, concerns, fears that I have and I think that's why it's so important that we continue with encouraging young people to go to events, conferences, to physically network, to, you know, just appreciate the importance of listening to what other people say. One of the phrases that I particularly like that gets used with me is what's called the magic of unlikely alliances. How things from left field, completely different sectors, completely different ways of thinking actually can be incredibly helpful, and I, you know, I worry the way we work now diminishes some of those possibilities of the magic of unlikely alliances. To flip it round and, you know, turn it the other way, I mean there's some fantastic opportunities, technology opportunities and, you know, on the technology IT side of things. You know, people that are starting businesses up effectively from their bedroom and things you could never have done before. In the world of aerospace the integration of drones into our airspace, I mean drones I think will become part and parcel of our everyday life, delivery drones, last mile drones, drones for healthcare delivery, drones for surveillance. But all of

that requires the integration of drones into our current airspace and that isn't going to happen without significant evolution of, you know, using applied artificial intelligence for airspace management, for example. I think the environmental challenges and goals, you know, the continued development of batteries, the continued development of alternate fuels, hydrogen, I think there'll be a huge agenda for hydrogen over the next twenty, thirty years. But where are we going to get all the electricity to electrolyze, to produce the hydrogen. So the challenge of looking at things from a total system perspective I think is great. But, you know, I just- well, and space, space, I've been fortunate – we haven't talked about space at all really this afternoon – but part of my responsibility at Cranfield extends to the space and astronautics agenda. And, you know, when I see the opportunities that are emerging for young people in respect of Small CubeSats, small satellites putting things into space, affordable space launch just opens up a whole load of new opportunities as well. So I think there's some very big opportunities around the space agenda.

[00:10:27]

Okay. That's really interesting, you're right, we haven't talked very much about space. I did mean to ask you, specially with this latest setback on the moon mission, whether you're sort of thinking even about things like moonshots, or is that really rather beyond your scope?

It's beyond my day to day, but it's not job responsibility. No, I mean we've got students at Cranfield that are very much enthused and involved in those. You know, I can, I mean the incident you refer to, I mean I'm hugely positive about some of the learnings that have come from that, you know, when you talk, when you read about the, you know, okay, it hasn't landed on the moon, but a lot of the equipment that was on there has been tried, tested, fed data back, you know, there's all sorts of positive opportunities from that. Aerospace Bristol, the museum we talked about earlier, one of the exhibits that we had last year was celebrating the milestone of Colin Pillinger's attempt to land on Mars, and there we are, an example that actually subsequently has been proven successfully landed on Mars, and the fault was in the deployment of the array and the subsequent ability to deploy data back to earth. So it's not just about landing successfully, it's that whole, you know, that whole kind of mission side of

things. So I actually think that mission, whilst the headlines will be it burnt up in space and landed back in the Pacific, is the headline you will get, I think from an engineering and a business point of view there's some big, big successes and I think that will encourage, again, you know, a number of people to get involved in smaller companies bidding to do work, bidding to put their own kind of Satcubes, their own satellites into space. So I'm really positive about those kind of opportunities. I'm also, I think there's been a lot of excitement, I mean the Elon Musk SpaceX initiative, what I found fascinating about that is I hear more people talking about the excitement and the buzz of actually seeing the rocket in an autonomous way land back on the earth after it's been up into space. So the excitement end of it doesn't always come from the, you know, that big launch event or things, I think there's some really, really exciting opportunities around low-cost robotics in space, biology in space. So it isn't just about moon and Mars missions, there's some really exciting commercial opportunities will come our way because of low-cost launch capabilities.

So what would your advice be to young people who might be thinking about a career in tech at the moment?

Do it. Have confidence in your ideas, have confidence, you know, be prepared to listen and learn from some of those that have scars on their back and been there before, but don't be intimidated by, you know, what people describe as the challenges. You know, it's a brave new world, so my advice would be, find a way of realising your dreams, do it by doing.

And is there anything you'd do differently if you were to have your time again?

Would I do differently? I think I've been incredibly lucky. If I'd done anything different it would have probably have been at the expense of something else, some other experience that I've done. But I mean some of your questions probably behind it allude to some of the things, you know, if I had my time I might have done differently. The international aspect's a really good case in point. But, you know, if I'm objective about it, I could have done things quite differently and it could have ended up in a completely different place that was not nearly as good as the place I'm in now. So I'm just forever grateful of the opportunities I've had along the way and,

you know, the early advice, I've seized those moments, learn from everything that you're asked to do, seize those opportunities. I've no, absolutely no regrets about any of that.

Well, that's fantastic. Thank you so much, it's been very interesting talking to you, Sir Iain, and I look forward to, yeah, seeing where we go next with technology and aerospace and all the work that you're doing in the area of innovation. Thank you for your time.

Thank you.

[end of recording]