Sir Clive Sinclair

Interviewed by

Richard Sharpe

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At his home in London

Welcome to the Archives of Information Technology. It is 28th February, 2019 and we are in central London. And in the Archives we aim to capture the past and inspire the future. I'm Richard Sharpe and I've been writing and researching about IT since the 1970s. And when I mentioned our new person who's going to make his application here to the Archives today to everybody, they were astounded, because they all said, oh wow, fantastic. You've got Sir Clive Sinclair, the innovator and entrepreneur. And if they were of my age or slightly older, they probably said, oh wow, I remember the Sinclair 2000, the quality on that amplifier was fabulous. Or if they were younger they said, yes, I remember that Christmas Day when I unpacked my ZX 80 or ZX Spectrum and spent the day playing games. And so it went on and on, because everybody has a story about Sir Clive Sinclair, given the impact he had on the IT industry in the UK.

Sir Clive, you were born in Richmond in 19…

I was born in Ealing.

In Ealing?

Yeah.

In 1940. Let's put that record straight then. Your father was a mechanical engineer.

He was.

And your grandfather was also an engineer, was he not?

[0:01:19]
He was a very able engineer. He was a ship designer, designed battleships. He was the leading naval architect in Britain, in fact. And he took, he sold a battleship, or Vickers sold a battleship to the Russians and they weren't happy with the gun emplacements, because they moved slightly when being fired. So he had to take 500 men from Glasgow to St Petersburg who worked through the winter to fix this, it was quite extraordinary.

And therefore it's somewhat in your genes to be…

I guess so, yes.

… an innovator. You didn't enjoy school very much, I understand.

Oh no, that's not true. I went to lots of different schools, about thirteen in fact. I was always getting moved around, which I quite enjoyed, stimulating. No, no, I… well, I can't say, no, I was glad to get out of school. [laughs]

And you were always good at mathematics?

I was, yes, yes.

And you were always interested in designing things, circuits and so on, even as a child?

Yes. Yes, I was interested in, yes, I was, yeah.

Where does that come from?

I don't know. I just… I had an interest in electronics from a very early age. I remember my, when I was a schoolboy, at the age of eight, my father bought me a crystal set, which I absolutely loved and was amazed by and I think that triggered off an interest in electronics.

[0:02:47]
And from there on you concentrated on hardware quite a lot, not so much the software?

That's absolutely right.

Why is that?

I don't… I just… I don't know. I just don't think software appealed to me.

It was the hardware, it was getting the chips and all of those things to work and soldering them together?

Yeah, absolutely. Yes.

I understand you're a man who has immense optimism.

Has what?

Has immense optimism.

Oh yes. I am by nature an optimist, yes, that's true.

And you think that things can be done, however hard they are.

I always seem to believe so, yes.

You come out with great whizzy ideas and then assemble teams to build these things for you.

I have done in the past, yes.

And it's the two sides of IT as well, it's not only computers as in the Spectrum and the Z80, but also you were involved in telecommunications, were you not?

Oh yes, yes. Yes, we had a sort of telephone business for a while, yeah.

Shaye Communications.

Yeah, yeah.

And the idea was that when mobile phones were very expensive and the calls were very expensive, that you would have a base and you'd go to that base and make a telephone call?

Yes, that's right. Yes.

It didn't quite work?

No, it didn't last, no, no.

Why was that?

Well, because cellular phones took over.

[0:04:09]
Right, okay. Now the first real IT breakthrough was a computer that people put together themselves.

Yes, that's right, the ZX80, yes.

I thought you had a Mark 14 or something before that?

Oh yes. Yes, that's right, yes. Yes, that was an earlier one, yeah.

What was the idea behind that?

It was a little kit that you could put together, yeah.

And where did you get the components from?

Oh, from Texas Instruments mostly.

Right, right.

And Ferranti.

And Ferranti. How did that idea come to you?

Well, it was just what was sort of interesting in the age. Tandy in the States had brought out the TRS-80 and I bought one for one of my sons and he was, he became very adept at programming it very quickly, he was a little boy, but he was very quick. And so I saw what computers could do, but they were very expensive. I mean, sort of equivalent to perhaps £2,000 in today's terms. And so I thought well, if only, having seen what pleasure they could bring and how readily a youngster could program one, I thought if only we could make one for the right price, which I deemed to be £100 in those terms, in those days – obviously a lot more today – then it would become something that every man could have.

And you were always aiming at a low price, weren't you?

Yes, indeed. I mean, what I've always done is what an engineer does, you know, he does for 10p what any damn fool can do for £1. [laughs] So I've always reduced the cost of things.

And also you have obsession in making them smaller?

Oh yes, I had that from a very early age. I don't have a clue why, but I've always been obsessed with small size, yes.

Everything has to be smaller?

Well, not everything, but anyway, yes, some things.

[0:06:19]
And you built around you a number of different companies and a number of different teams as well?

Yes, over the years, yes, that's true.

Would you say that that's your forte, as well as being…

No, no, not really. No, I don't think I did it very well. I mean, I did my best, but I think what I was good at if anything was designing and, designing things, but I was never a good manager and I didn't really learn to appoint good managers, I didn't know how to pick them. So no, I was never a good manager, so I was not a good runner of businesses.

But you did have, I believe, you have a bit of a history of not liking politicians and bankers, for example.

Oh, that's not true, no.

No?

No.

Okay.

Where did you get that idea from?

Oh, I've been trawling around all types of people asking about it.

Oh, I don't remember disliking politicians.

Okay.

No, I mean I liked Margaret Thatcher very much indeed.

Okay.

She was very enchanting.

[0:07:22]
And you not only built in terms of the design, but you built a business model as well, didn't you? Which was, you advertised it in a specialist magazine…

Oh that's right, yes. Yes, what I did when I started was to advertise – I sold mail order – and what I did was, at that time other people took little tiny ads for their products and I completely changed the approach, I took full-page ads, which was a dramatic move and it had dramatically successful results.

And then they would pay, by cheque.

Yes, that's right.

They would send you money for a product they hadn't seen yet.

Indeed they did, yes. It was a remarkable age.

And an age of trust.

Yes.

And you had how many days to send them back that product? Twenty-eight days, was it?

Yes, that's right, yes.

So you had a positive cash flow for twenty-eight days?

Oh, dramatic, yes, yes. [laughs]

Extremely good when it worked.

It was indeed. [laughs]

And you hadn't have made the product by then?

No, sometimes that was rather true. [laughs] Yes.

So that kept you afloat quite often if you had, say, a problem with manufacturing or something like that.

Yes, yes. Getting the money upfront obviously financed everything.

Okay. Other people of course took up that business model.

Oh yes, certainly, yes.

Yes. And you based yourself in Cambridge?

Yes.

Why was that?

Well, it was an accident really. We had been in London, I mean the family had been in London, and I got a bloke to help me and he said he could find space in Cambridge, which would be much cheaper than London, and so we moved to Cambridge.

Did you go to university?

No, I didn't. Well, that's not quite true. No, I didn't- when I was, I was at school, I just said I wanted to get out and make a living, my parents very much wanted me to go to university, specially my mother. And, well, I think they both did in fact. And I got a job with *Practical Wireless* and I told my parents it was a holiday job, which it wasn't. And I did that and then I got a job, well, it was with the publishing company, very quickly, so I was doing well and that was the end of it, university-wise.

And so you really started off earning your living as a journalist?

Oh, I did, yes, that's right, yes, yes.

And you had access, therefore, because of the subjects, to all of these components.

Yes, yes, that's right, yes.

Which must have been heaven for you?

Yeah, it was very good, yeah.

[0:10:06]
And what were you building then?

Well, the first things I did were a little tiny amplifier, audio amplifier, tiny, tiny one, that was the very first one, I think. And then I went into small radios, earpiece radios. Transistor radios were new in those days, so I designed little kits for small radios, earpiece radios, and they sold very well and that was quite successful.

So again, going for the first and going for small?

Yes, that's right.

And going for kits?

Yes, kits and low price, yes.

So you would have to have some degree of expertise to assemble that kit?

Oh yes. No, not too much, no. What you needed was a soldering iron, it came with a printed circuit board and it wasn't too difficult.

Right. And it could be done. How many did you sell then, of these radios, d'you remember?

God knows. No, I don't remember, know them. No I don't.

But you used the same business model, did you?

Yes.

An advert and the cheques rolled in?

Yes, that's right, yeah,

Who made the chips for you?

Well, they weren't chips in those days. They were individual transistors, and I bought those from Plessey in Swindon, who were making transistors under licence from Philco in the United States, and they rejected quite a lot of their transistors as not being sufficiently good for the computer market which they were selling into. But in fact they were perfectly good transistors and I used to buy them in quantity and then test them and sell them for the kits.

Right. So what date was the radio?

Oh, gosh. 1967? I don't know.

Right. But you were only twenty-seven then?

Yes.

So you were very early into this entrepreneurship process.

Yeah.

And you left journalism and decided to…

Yes.

… make it a fulltime job, did you?

Yeah. I left journalism when I was twenty-three, so I must have been in the first kits in, twenty-three.

[0:12:29]
Right. What was your next major product then?

From radios, went into hi-fi, yeah.

The excellent turntable and the amplifiers?

Yes, System 2000. And Neoteric was the first one, I think, which I did the electronics and my brother did the styling.

Yes.

My brother helped me a lot with styling for products really.

And that's Iain Sinclair.

Iain Sinclair, yes.

He was an industrial designer?

He was indeed, he still is.

Right. And the styling was sleek, was it not?

It was, yes.

It was stainless steel or…? Looked like it.

Aluminium. Aluminium, yes. System 2000 was aluminium. The Neoteric was rosewood and brass knobs.

Right. Rosewood and brass knobs? Wonderful idea. [laughs]

Mm, it was very beautiful.

And they sold well, again.

They did.

Okay. And after that, what was your next move?

Erm, well, I suppose into computers eventually, yeah.

Right. So when was that? ZX80?

[0:13:32]
Yes, actually yes, it was. That came out in 1979, and followed by the ZX… very closely by the ZX81, which was, the ZX80 used a lot of discrete components and then the ZX81 I mocked up a lot of the discrete gates into one chip, which – from Ferranti – and so the entire computer only had four chips in it, at a time when the best competition had 46.

From 46?

Yes, yeah.

And dependent upon this chip made specifically for you by Ferranti?

That's right.

And it was a chip that was a gate array, was that what it was called?

It was exactly, a gate array.

Can you explain that to the audience?

Yes, it was a chip with lots and lots of gates on it and you could then have a single mask to your own requirements that would determine the connection of the gates, and therefore customise it for you.

Was Ferranti good to work with?

Very good indeed. I worked with Ferranti an awful lot. A chap called David Grundy was running things and they were a tremendous help to me, and we worked on quite a few projects.

But they went the way of all flesh, did they not, Ferranti?

Oh, eventually, I suppose, yes, yes. Yes.

Do you regret that?

Oh, it's very sad, yes, yes.

Including the demise of Plessey, who you were a customer of, and Ferranti.

Yes, yeah.

And GEC.

I know, I know. Yes.

Didn't GEC offer to take you over once?

Yes, that's right. Sir Arnold Weinstock did, yes.

And you said?

No. No thank you.

Why did you say no?

Erm, I never wanted to work for someone else. Not in my nature.

Right. Not in your nature at all?

Not at all.

Right. And these times, with the Spectrum, for example, you also had the Black Watch in '75?

Yes, that's right, yes.

The small Black Watch?

Yes. Single chip, first watch with a single chip.

Sell well?

Yes it did. We had technical problems with it, but it did sell very well, yeah. Again we had a kit version. Yeah, it was a lovely thing.

Okay. And you also had a calculator?

Oh yes. Of course we got into calculators, yes, that's right. Right at the early days.

Very slim.

Yes, yes, that's right.

Again, another first?

Yes, it was, yes.

What was first about that?

[0:16:03]
Well, the thing was, that calculators in those days, so-called pocket calculators, were closer to the size of a brick than a pocket instrument. And what I did was – with my colleagues – my idea was that if I could take the chip and reduce its power consumption by switching it on and off, so it was only on for ten per cent of the time, literally ten per cent, I could cut the power consumption dramatically. And I had this idea that the chip would retain its data if it was switched off, and it did, by sheer chance, by luck. And so I was able to use the power consumption – well, actually it was over ten times – and so instead of having great hefty batteries, had hearing aid cells, and so it was a very- it was only eight millimetres thick and it would just slip into your front pocket.

And that wasn't self-assembly, was it?

No, I don't think we ever did a kit version of that, no.

No, you made it yourselves or had someone make it for you, assemble it for you?

Yeah.

How much did that sell for?

Oh gosh. £79, I think.

These are amazing prices for that period.

Yes.

When calculators were hundreds of pounds.

Yes, yeah.

Hewlett Packard were making these marvellous, wonderful calculators which were…

Oh, Hewlett Packard, yes, fantastic.

…which have everything in them, but you didn't necessarily need it.

[laughs] Yes, they were wonderful. Hewlett Packard, yeah.

A lot of your products depend upon this ability to advertise.

Oh yes, in those days, yes.

You were a great self-promoter. Where did you get that from?

I haven't a clue. [laughs]

Right.

I suppose being in the, I suppose from being in the magazine and book business, yeah. Yes, because I was in the magazines for quite a while, a wee while.

[0:18:03]
Having moved to Cambridge and having had the success of the 80, 81 and the Spectrum, there were a number of other companies around Cambridge at that time and individuals around Cambridge at the time and it's called now, The Fen, Cambridge Silicon Fen.

That's right.

Were you gregarious in that way? Did you go to those meetings in the pubs which other people like Hermann Hauser were at?

I don't remember Hermann Hauser being in the pubs much.

Okay.

Chris Curry was. Not Hermann, I don't remember him in the pubs.

But there was a certain both rivalry and competition and- but also interdependence, was there?

Tremendous, yes. Tremendous, the convivial spirit, wonderful, yeah.

How did that work out? Can you give examples?

Not really. [laughs]

Okay, okay. And this has been portrayed in the Micro Men*, I don't know whether you've seen it?*

I have, yeah.

Were you happy with the way you were portrayed there?

[laughs] Not gloriously, no. [laughs]

What was your response to the way you were portrayed?

I ignored it, pretty much. I didn't… what it was on. I thought it was nonsense.

You thought it was nonsense?

Well, it wasn't entirely, I mean it was reasonably accurate. But no, it annoyed me at the time.

You decided not to co-operate with the making of it, is that right?

That's right, yes.

Do you regret that now? Might you have softened the edges of your portrayal?

I've no idea, really. Interesting point. [laughs]

Okay. But you are a man who can say no, I'm not having that, quite quickly. Is that right?

I suppose so.

And this is the push of someone who sees something. You see these things, don't you? Yes?

I hope so, yes. I think what I've done well, if I may say so, is to see the future. Forty years ago I gave a talk to Joint Committee of Congress on the future, that was the purpose of the committee. And I projected a lot of things then which came to pass, including driverless cars. I remember saying, you enjoy driving, do it while you can because one day you won't be allowed to. And that was a long time ago.

[0:20:23]
Right. In fact transport has been one of the subjects that you focussed on?

Yes, with disastrous results in the case of the C5, but otherwise quite enjoyable.

And you were very, very early on a proponent of, proposer of electric cars.

Yes. Oh yes, indeed. Yes, again, over forty years ago I was doing paper designs for electric cars, yeah. I saw into the future very much.

But you're not Tesla.

I'm not Tesla, no. God, he's, yeah, Elon Musk is a genius.

He's a genius?

He is a genius, yes.

Do you consider yourself a genius?

Well, I've no idea, it's not for me to say. You can't really see yourself.

The definition of a genius in OUP, or Oxford University Press dictionary; natural ability, having something special, mental endowments, an innate aptitude. They describe you, don't they?

I hope so, yes. And I do know what OUP stands for, by the way. [laughs]

Oh yes. Maybe our listeners don't. Course you do.

Sorry.

[0:21:35]
And there's another side of genius as well, isn't there? Of being a bit odd.

Oh, I guess so, yes, yes. Elon Musk is, but… bless him.

Why don't you use the internet?

I'm lazy really, so I've never got round to learning how to do so.

Is that a real answer?

It's a partial answer. I haven't found the need for it really.

Not the productivity that is said to come with being able to have emails and access to so much information?

No, no I haven't found, funnily, the… no. But part of it, I think, is that I like reading from paper, so I don't really like getting data from the screen much.

Are you still reading technical manuals and…

Yes. Yes, indeed, yes.

What are you reading currently?

Oh well, I take, well I take sort of soft ones like, you know, *New Scientist* and *Nature* and, you know, I take several. Got loads of magazines, actually.

Right, okay. You did well with the ZX80 and the Spectrum as well. What is it, ZX81, 1.5 million units sold?

I've forgotten, but…

Yeah. And the Spectrum as well?

Yes. Yes, it was the first one over a million, I know that.

Right. And your brother was partially the designer, but also there was a Rick Dickinson?

Yes, indeed. Sadly died just recently.

Yes, last year, 2018.

That's right.

And he was a designer for the 81 and the Spectrum?

Yes. And Spectrum, I don't know. Anyway, he was early on, you know.

[0:23:14]
Right, right. Design is important for you, is it? The look?

Very much, yes.

Why is that?

It's just a question of aesthetics. I have always loved good design. I can't do it, no skill at all myself, but I can appreciate it, and my brother is a very great designer and I've always loved his work, and the work of others.

Right. And so you insist on that level of it. It's rather like Steve Jobs and his- he can't necessarily design it but he knows when it's wrong and certainly when it's right aesthetically.

Indeed, yeah.

Having that type of background…

I went to see Jonathan Ive once, by the way.

Oh yes?

Yeah. Marvellous man, yeah.

He's a great designer at Apple.

Absolutely, yes. Yes, he was knighted for his genius.

[0:24:05]
True. And you were knighted as well.

I was, yes.

Yes. And you came up against another man who has been knighted, Sugar.

Alan Sugar.

Alan Sugar.

Yeah, yeah.

Sir Alan Sugar, with Amstrad. Now, if we do a compare and contrast of Amstrad and Sinclair, it is an amazing story really, because here are you, an innovator in business models, an entrepreneur setting up companies, an engineer who can reduce 46 chips to four, can discuss directly with Ferranti all the technical things needed to do a gate array, and here's Alan Sugar who says, I don't care what it is, I just want to make money.

[laughs] A mug's eyeful. [laughs] Yeah. Yeah.

Of the two of you, who do you think had the most impact?

Oh, I've no idea at all. I've no idea. I met Alan on a couple of occasions. He was very amusing, very witty man.

How do you find him amusing?

He was very witty, he was very quick-witted.

Right. In '86 you had to sell some of your rights to him, did you not?

Er no, we didn't in fact.

Okay.

No, he wanted to, but it didn't happen.

Right. You were about to sell out to some company or another?

I can't remember now.

In the later, in the mid-eighties? Things turned a bit sour for…

I know they did, yes, yes.

[0:25:33]
What happened?

Oh, with the market downturn, you know, just everything changed. Yeah.

But not for everybody?

Well, in due course, pretty much. And Amstrad hit the fan as well.

Right. And you think you were early into that particular dip?

Yeah, yeah.

Because?

I don't know.

Okay.

No. Probably don't like to think about it too much.

Okay. That's understandable. That's quite understandable. Where did you go then after that in the mid-eighties?

[0:26:09]
Well, the C5 of course, I tried and that was a failure. But I also did electric bike, the Zike, and I'm still sort of doing electric bikes. At the moment, I can't, they're not on the market because the European Union, in their lack of wisdom, has imposed a punitive 130% duty on them, so I can't import them and I don't think I can get them made in the UK, though I might try. So that's a bit of a bother.

Do you still have a belief that it is possible to do so many different things? Are you optimistic, should I say, still about the future?

Yes, indeed, yes.

You are?

Yeah, always, always.

It's been reported that you think that if you're going to build robots you should be aware that they're going to probably take over.

[laughs]

Is that so?

I don't remember. Well, it's probably true, but yes.

Do you think they will?

Well, they certainly could, yes. I think we're going to have to be very careful.

How could they?

Well, once, well, the point is, that once you make a machine, a robot with human capability – and that's entirely possible – that you might lose control and that might make another machine that's even better, and so on. So it's a very dangerous path.

So it's the combination of robotics and AI, is it, that you're concerned about?

Yeah, yeah.

And you see in the future that humans will just lose control of this?

They could, if they're not very careful.

And what would happen then? As far as you're concerned?

Oh, I've no idea what would happen, but they might lose control and we've just got to be very careful. Which we probably will be.

If you were starting out again today, where would you start?

In what – business, d'you mean?

Yes.

Well, electric vehicles is still a passion of mine and, well, I'm still involved in it, and I remain a firm believer in that. Which is hardly surprising, everyone seems to be now. And I always had a passion for flight. I think I would love to work on some of these, you know, electric flying machines. But everyone's working on them now, so there's perhaps not much to be done.

[0:28:33]
How do you keep your motivation going and your optimism going, given that your history is that of, yes, hits, but some misses as well?

Yeah. I don't know really, I just, it's just a natural optimism and always firmly believed that the future will be good.

And you still believe that?

I do, yes, very much.

Every successful entrepreneur starts with three failures, you were quoted as saying.

[laughs]

What were your failures?

Oh, oh I see, I don't know. I don't remember saying that either. Doesn't sound like me. I'm not sure I believe it. No, I'm not going to list my failures.

Okay. What were your biggest mistakes?

Well… I suppose, I don't know really. Not getting out soon enough, I suppose. I don't know. I'm not very good at looking backwards.

You're not very good at giving up either, are you?

No, I'm tenacious.

Yes, you just don't want to give up.

No.

And sometimes surely you do have to give up.

Yes, sometimes.

Would it be advice to young people nowadays who are considering entering the IT sector to say to them, well perhaps you should occasionally just give up something?

No, no, I would never give that advice.

You wouldn't give that advice?

Not at all.

What would be your main advice?

Don't give up. [laughs]

Keep going?

Yeah, absolutely.

Keep going.

Stick at it.

Okay. You had as well a possibility of entering into a collaboration with ICL on One Per Desk, is that right?

Oh yes, that's right, yes. Yes, that's right. Yeah, that was, well, we did and it didn't succeed.

And the idea was, you would have what would be equivalent of a PC and a phone on a desk, and hence you only had one thing on the desk.

Yes, that's right.

And did you work with Wilmot on that, with Robb Wilmot?

Yes, yeah.

Why didn't that work?

You'd have to ask him, it was his idea and his business. I didn't interfere.

You were going to do the gate array, is that right?

We designed the product, the guts of it.

And again, was that with Ferranti?

Yeah, yeah.

Did they come through?

Oh yes, everything. But I mean, we didn't do the product, that was Robb Wilmot.

Right. And d'you think, why didn't it work? You don't know?

No.

Okay.

Well, I do know really. It was timing. It was about the time that IBM came out with their machine, and although that was technically vastly inferior, in that it had vastly more components and was a hugely poor design, but it was IBM and so it became a standard, and bang, that changed the whole feeling.

[0:31:42]
Did you never sit down and say, obviously as Amstrad did, I can design something a lot cheaper and better, or have it designed a lot cheaper and better, and go into the compatible market?

I didn't, no.

Why not?

I don't know. I didn't. I mean it was fancy, perhaps. I don't know. But anyway, I didn't. I didn't want to. I didn't want to do a me-too product, I suppose.

You never have done a me-too product, have you?

No, I haven't, no.

Not that I could find you out about. You got, the National Enterprise Board were interested in investing in you, did they invest in you?

I think they did in a way, but I found them an appalling lot.

You found them appalling – why, how?

Oh, well, they were interfering, they thought they knew stuff, they didn't have a clue. It was a very poor, it was a very socialist load of claptrap.

And this was the Clive Sinclair who doesn't like to work for other people, is that right?

[laughs] Yeah, that's right, yeah.

He's back again.

Yeah.

[0:32:50]
Okay. You didn't get the BBC Micro contract.

No, that was an outrageous business. My great friend, Chris Curry, completely screwed me up and he went to the BBC and said look, here's our computer, we'll call it the BBC computer and you can have 5% on every one that's sold. And the BBC said yes, which was criminal, so we got sunk by that.

What should the BBC have done?

Should have taken our, well, they shouldn't have interfered. Wasn't their job, but they wanted the money.

So they just shouldn't have done anything about microcomputers?

No, I don't think it was their business to get involved with a commercial attitude with their projects.

Right. And you have an attitude which is in that sense Thatcherite, is that right?

I hope so, yeah.

These type of corporations, particularly say, the BBC, should keep to broadcasting and not fiddle with…

That's so, yes.

Right. Did that not lead surely to the destruction of the electronics industry in the UK?

Oh, I think that's going a bit far, but maybe, I don't know. Could be.

No Plessey, no Ferranti.

Well, you're right, that's right, yes.

No Marconi.

No, I know. Terrible, isn't it?

But Siemens does carry on, for example.

Yeah, but it's not exactly an English company.

It's not exactly…?

An English company.

No, no, exactly, that's what I mean. Siemens carries on.

Oh, I see what you mean. Yes, it does carry on, yes.

Yes. Alcatel carries on, Ericsson carries on.

Oh yes, that's right.

But we don't have it.

We don't have it, no.

What is the reason for that?

I'm not that clear-sighted to know.

But we have brilliant engineers like you.

We have brilliant engineers in this country, perhaps the best in the world.

And entrepreneurs like you. It doesn't seem to happen as much.

Well, we do in certain fields, I mean aerospace, for example, surprisingly enough, we're the second largest aerospace country in the world. Because we make so many jet engines and wings for aircraft, don't make so many aircraft.

And we do have ARM.

Oh yes, yes.

Well, but we don't, it's Japanese owned now.

Oh, it is, yes, yes.

Do you regret that?

I thought that was very sad, yes.

Should that type of thing be stopped?

I don't know. I'm not…

You don't like to be drawn on political issues, do you?

Not really, no, I'm not a political person really.

But you have a political attitude towards these things?

I suppose.

You suppose, you do, don't you, really?

Yes, yeah.

[0:35:24]
You're still working on electric cars, is that right? Or electric vehicles?

Electric vehicles, yes.

And what would you hope to gain there, what would be the next step there?

Well, I've got this electric bike which I've designed, with a colleague, and I want to get it on the market, but I've got the problem I mentioned over the duty.

Right. That's purely, that is the problem?

Yes.

Okay. Were you associated with Retro-Computers?

No. Only indirectly. I didn't. David whathisname did it and he put some shares in Sinclair Research name, but I didn't ask him to.

And they were going to…

David Levy.

In 2015, they were going to build a Spectrum, weren't they?

They were, yes.

For £100.

I don't know the price.

And people didn't get it.

No, they didn't, no. Sorry.

[0:36:33]
How does, in your estimation, innovation really work? Where do you get these ideas from? D'you know?

Well, it's projecting from the present. One can sort of see a trend and follow it through, nothing really more clever than that.

But it is clever because lots of people can't do that at all.

Oh perhaps, that's so, yes. Yeah, perhaps they can't.

Okay. Maxwell, Robert Maxwell…

Robert Maxwell, yeah.

Then owner of The Mirror.

Bob to his friends, yeah. [laughs]

The Bouncing Czech, he was called, with both spellings of Czech, was going to buy you up and save you, for £12 million in 1985.

That was a lie, he wasn't going to do anything of the sort.

He'd splashed it all over the front page.

He just stuck it right on the front page, it was a complete lie.

But he didn't do it.

He didn't do a damn thing.

Didn't that disappoint you?

I don't know. Don't know really.

And very soon afterwards Dixons were going to have a sales blitz.

Well, they did. They bought a whole stack of Spectrums, a huge number, and yeah.

And knocked them out quite nice and cheap, but you got some money from them.

They did, yeah.

Did you not have a relationship with Timex in the United States?

Oh yes, very much so. Fred Olsen, who owned Timex – well, he still does, of course – he had this factory in Dundee, which at the time was the largest watch factory in the world, believe it or not. And mechanical watches were not doing so well, so had a lot of capacity, and he made our computers. So he made millions of computers for us in Dundee.

Didn't they have a marketing agreement as well for the US?

Yes, they did.

Okay.

Yes, yes.

How did that go?

Not well. They didn't… they changed the product and that was a failure.

Right. It does seem to be a pattern, that British entrepreneurs don't necessarily do well in the US.

It does, yes, I agree.

What accounts for that?

I don't know. I really don't know. But it is definitely a pattern. Yeah.

ARM has done well in the US, of course, with Apple and the iPhone. And you could say perhaps a lot of the software people, AI people have done relatively well, but never been able to really crack the US market.

No, no. It's strange.

You think it's just strange or is there a pattern there?

I haven't a clue. No, I don't know.

Were they difficult to work with?

No, not a bit. No.

They had your attitude – let's go do it.

[laughs]

Yes? Is that right?

Yes, they're very positive.

And you welcomed that?

Oh yes, of course.

But somehow these don't seem to work.

No, no, no. We licensed our – what was it – our technology to Gillette and they screwed it up. Yeah. I remember going to see Gillette and they said, well, the President would like to take you to lunch. So I said, oh my goodness. They said, yeah, he's going to take you to his club – this was in Boston. And I said, oh my god, that must be the poshest club in town. Oh no, no, it's not, they said, he's a Catholic. [laughs] Can you believe it?

But he was a Boston man, was he?

Yes.

Why were Gillette interested?

Because they wanted to find some area to expand into. You know, they commanded the shaving market and they wanted to get something new.

[0:40:41]
What about domestic products? You've never really been into domestic products, things in kitchens, for example. Your thoughts don't turn to that?

No, no, they never have. No. I don't know. No, I'm not a Dyson.

If it's not got a circuit board you're not particularly interested, is that right?

I suppose that's right, yes. It's electronics I've been interested in.

Right. Where will electronics be in the next twenty years? Will Moore's Law continue?

No, not in semiconductors. No, that's come to an end, because it's hit up against quantum limits. You can't make the transistors any smaller, smaller than they are, they cease to work. So no, Moore's Law doesn't work any more.

And what is the implication of that, therefore, for the future?

That's a good question, I don't have an answer. [laughs] Well, all industries do get to that point, don't they? The Bessemer process produced huge increase in steel production, but eventually steel ran out of markets and didn't increase any more. In fact declined. And the same happens in semiconductors.

But the impact is, surely given the fact that we have been sitting on that particular rocket of exponential growth in power and diminution in size for so long, that is going to have…

Well, it means the industry stagnates and declines. No way around it.

[0:42:22]
Are you happy not to be in that industry which is likely to stagnate?

I haven't thought about it. Yes, I expect I am.

D'you think there is a future for quantum computing?

Oh, well, you know, I'm ashamed to say that hard as I've tried, I don't really understand quantum computing. I can't get my head round quantum mechanics. I mean, read books on it and I sort of fundamentally know what it says, but I can't say I quite believe it.

Right. But it has been touted about as…

Oh, very much so. And has been for a long time.

Well, that is true. It's been coming for a long time.

Twenty years, yeah.

Yes. D'you think that that means it probably won't come?

I think it's doubtful.

Right.

It's very doubtful, I think.

It's like…

They can't maintain the quantum states long enough to get it to work.

Right. And it's rather like other seeming breakthroughs like, do you remember Josephson junctions?

Josephson junctions, I do indeed, yes.

Yes. Tunnelling, etc.

Yes, yes.

IBM put billions into it, millions. The Japanese went for it as well. Couldn't do it. What was the problem there, do you know?

Again, I think it's, it's a quantum thing. It's maintaining the state. Yeah, Josephson junctions, most extraordinary thing, wasn't it?

Right. What should the government do about the state of the IT sector in this country after Brexit?

God knows. Leave it alone, probably.

Leave it alone?

Yeah.

You don't like politicians fiddling with industries?

I do not. They make a very bad job of it indeed.

Right. And you would point to what? ICL?

Yes. Or any number of things. The British car industry, if you remember. God, no, you get government involved you've really screwed it up.

Thank you very much.

Thank you.

Pioneer.

I've enjoyed it very much.

So have I, thank you.

[0:44:34 recording ends]