An Interview with

ARTHUR L. C. HUMPHREYS

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Charles Babbage Institute
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University of Minnesota, Minneapolis

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Abstract

Humphreys, a former managing director of International Computers, Limited (ICL), reviews the history of the British computer industry. Topics include: the termination in 1949 of the trade agreement between IBM and the British Tabulating Machine Company, the merger in l959 of British Tabulating and the Powers Samas Company into International Computers and Tabulators, Ltd. (ICT), and the merger in l968 of English Electric Computers Limited and ICT into ICL. Humphreys explains how the last merger was enacted by the government to establish a single national computer company. He recalls the government's pride, as expressed by Prime Minister Harold Wilson, in maintaining a position in the international computer industry.

Humphreys also discusses the strengths and weaknesses of the British computer industry, and compares the management of the British and American computer industries. He mentions the European Economic Community's efforts to establish Unidata, a multinational computer company, and the problems associated with conducting business across Europe's linguistic and cultural boundaries.

ARTHUR L. C. HUMPHREYS INTERVIEW

DATE: 28 February 1981 INTERVIEWER: Erwin Tomash

LOCATION: Los Angeles, California

TOMASH: The date is February 28, 1981. I am Erwin Tomash and I'm sitting here in Los Angeles at my home talking with Arthur Humphreys, Director of ICL, former Managing Director of ICL, and an old personal friend. We're going to spend a little time discussing Arthur's career in the computer industry and the formation of ICL. Arthur, it would be nice if you could just start informally and tell us how you came to enter what is today called the computer business.

HUMPHREYS: Thank you very much, Erwin. It's a pleasure to be with you. We've known each other for quite a long time. I was involved in my early business career in the law, which was a good grounding for a young lad. Next I was involved in the principle of litigation, so I was exposed to the seamy side of life in many directions at a very young and tender age. However, in the war which began in '39 as you know, I was called up to be in the Army, but I suffered some medical trouble and was invalided out in October, 1940. As it happened, a cousin of mine was the Assistant Secretary of the British Tabulating Machine Company, which was the British licensee of IBM and had rights to sell and market punched card accounting machines in the British Empire, except in Canada. My cousin asked me if I would be interested in joining the British Tabulating Machine Company, as its Share Registrar, and I did. I discovered that there wasn't too much activity with the company's shares during the war, which gave me the opportunity to be involved in certain commercial aspects of the business. And when I discovered that the company was a licensee of IBM--at that time I'd never even heard of IBM--from when I first joined I was engaged in certain commercial correspondence with IBM and indirectly, therefore, found out more about them.

The British company was very, very small really. It had rights to acquire machines on a preferential basis from IBM, but it also developed adaptations to fundamental accounting machines to take account of the fact that in Britain and in the Empire we were eccentric enough not to be on the decimal system. The great IBM in those days didn't really pay much attention to anything other than dollars and cents; pounds, shillings and pence were a complete mystery

to them, as indeed were hundred weights, quarters and pounds, and rupees, annas and pies. But if you're going to seek to get business in Britain and in the Empire, you have to deal with those curious factors, and currencies.

And this therefore led to the British Tabulating Machine Company having to have some development activity and seek to find solution to these non-decimal systems in the best way it could. In 1904 I think, with Dr. Hollerith himself, and a man named Raleigh Phillpotts, who with another fellow named Robert Porter, started the British company called the Tabulator Limited.

Dr. Hollerith was looking for a licensee outside of America for his equipment, and this therefore, led to him speaking to his friend, Mr. Porter who in turn had a friend Mr. Phillpotts, which led to the creation of a company in Britain, which they called The British Tabulation Machine Company. This agreement was, of course, eventually absorbed by IBM; IBM was christened IBM I think in about 1914 from the American Tabulating Machine Company. But the interesting thing about this agreement was that there was no power to end it. The lawyers were so busy in those days setting up the terms of the agreement, they failed to include any clause which gave any opportunity to terminate it. It could therefore only be ended by mutual consent. And it did subsist from that time in 1907 until 1949 when the agreement was ended. But that's jumping ahead of it.

In 1940 I remember very clearly--to start with, I'd found out who IBM was and I heard for the first time the name of Mr. Thomas J. Watson. I was really impressed by their generosity. Britain was in a war time situation, but we used to receive cables from IBM saying "Please give a banquet to all your staff." "Please let us have the names and addresses of all your staff, because we'd like to send them a food parcel." "Please give $50,000 to King George's fund for sailors and debit out royalty account." And it was very typically, if I may say, generous of them to do that.

Now, time goes on and the war eventually came to an end and there had to then be a reckoning between the British Tabulating Machine Company and IBM as to its liabilities for royalties, and my job was to calculate these royalties. The agreement with IBM was very extraordinary because not only was there no clause to terminate it, but our royalty was exactly 25% of the revenue, which was really so large as to frustrate the growth of the company. And because

the growth of the company was frustrated, I think it probably disappointed IBM. The techniques of leasing finance and all sorts of other arrangements whereby outside financial assistance can be secured to lease or hire the supply of equipment to customers was really beyond any dreams of the people who were running the company in those days, and the British Tabulating Machine Company was really run by English gentlemen, and I think the business came forth after hunting, shooting and fishing, again to the consternation of Mr. Thomas J. Watson, who thought it ought to have been developed faster and made much larger than it was.

But however, this was the situation. But at the end of the war, it was necessary to have an accounting and settlement and I was personally involved in checking back all the amounts which were due to IBM, and whether or not we had satisfied the requirements of the licensing agreement. And in this way I got to know quite a lot of people in that company, and how it worked.

Because I'd been involved in this commercial activity, and interested in the products and in the development of various features which were necessary to make the machines capable of being operated in the market of Britain and the Empire, I had a particular interest in engineering and in production, although I was only in a lowly position in administration. So this served well for my own career development.

I think a turning point came certainly in 1949 when...the license agreement between the British Tabulating Machine Company and IBM was terminated, I think by mutual consent, which was the only way in which it could be done. I was only a young man in those days, but I remember being asked by the Managing Director of the British Tabulating Machine Company whether I agreed to the policy of terminating the agreement with IBM, and I said "Well, I don't know all the ins and outs, but if you had asked me for my advice before you had terminated I would have told you not to do so." To which I was told, "Well, that's an interesting comment, but it's been done, so I'd better get on and do my job as I was told."

1949, therefore, was a very important watershed, because IBM got rid of its licensee and was able to trade in Britain and also develop its business everywhere in the British Empire. We at BTM felt that we ought to spend the royalties

which we were now not paying to IBM on engineering, but of course it was relatively a small amount against the need to incur the substantial engineering expense in this rapidly evolving technology. And '49 was very interesting, because it was really the first manifestation in some depth of the impact of the computer age. I remember just before the agreement was ended we were asked by Mr. Watson to give our views as to whether as a punch card company we would be willing to provide card leaders and punches and printers to organizations who thought they might like to develop central processors. In those days, of course, anybody could put together some electronic trickery and make a central processor, but very few were able to make or manufacture equipment which would put the information into a computer or get it out. Hence the value of the punched card equipment for input and output. I know at that time we had a visit in the British Tabulating Machine Company from the newly appointed Managing Director of Britain's National Research and Development Organization--Lord Halsbury. This was in, I think, early 1949. And he said, "Well I can tell you gentlemen that the only place you'll see punched cards and punch card equipment in ten years time will be in the British Museum." Well, he was just off a few years--the use of punched cards subsisted for much longer than ten years, and are still in limited use even today.

However, the evolution of the computer business left the British Tabulating Machine Company somewhat bereft of any expertise, and I suppose I might say that IBM themselves were not too well placed in this art at the outset. In fact, it was not until UNIVAC succeeded in getting an installation of a computer, UNIVAC I, in the Bureau of Census, replacing a lot of IBM punched card equipment, that IBM first got the message.

In Britain, simultaneously and contemporaneously with the development in the United States, some firms, Ferranti, English Electric and universities, were encouraged by the British govemment to develop computers and I think Ferranti Ltd. first introduced their product which was known as MARK I Star to the commercial world perhaps a day or two ahead of UNIVAC, but it was sort of a friendly rivalry as to who actually was first. But British computer activity did get off to quite a promising start with Manchester and Cambridge Universities. The British Tabulating Machine Company tended to continue to believe in the continuing viability of punched cards and didn't too soon identify itself with the significance of computers.

However, it did some pretty good work in producing equipment using electronic techniques, but limited to multiplying equipment and calculating equipment. And the BTM had some very good products.

The computer age, really, as regards the British Tabulating Machine Company started to take shape when Dr. Booth, a pioneer in terms of British people in computers, became involved directly with the company and produced or helped to produce the HEC I computer. We had a limited success, I think, with that, but the next step was to collaborate with British General Electric Company Ltd. in computer development, specifically the 1301 computer system. We also had the opportunity to reflect upon the fact that there were in Britain two punched card companies: the British Tabulating Machine Company where all my experience was; but our competitors were Powers-Samas. They were a derivative of a company started in the United States by Dr. Powers, who was an associate of Dr. Hollerith right back in the 1880s and '90s. The Powers Company in Britain used techniques which had been devised by Dr. Powers very early. Powers was at one time a licensee of Remington Rand and they got into marketing equipment in Britain in competition with us and also in Europe, from about 1915 onwards. In 1958, the people responsible for the punched card businesses in Britain reached the view that having two punched card companies wasn't too sensible in competition with such a powerful company as IBM and with other American companies, which at that time were beginning to emerge in the computer field.

And in 1959 the Powers Company and the British Tabulating Machine Company were merged together to form International Computers and Tabulators, Ltd., known by the brief or short title of ICT. That was just the start of a strategic policy to try and consolidate within Britain a capability in computers. And the first step after that was to seek to make an arrangement with Ferranti, Ltd., which they were unable to agree--but we did--the new company, ICT did acquire the computer capability from British General Electric Company and as ICT completed the development and marketing of the 1301 computer system.

Shortly after that the Electrical and Musical Industries Company (EMI), who were also engaged in computer development, reached the view that it would be better for them to not deal in computers, but in music, and it became possible early in 1962 for ICT to acquire their computer division. And in 1963, at last, the opportunity presented itself

to acquire the Ferranti Computer Division, and that gave ICT a fair amount of capability in computers.

At virtually the same time, one sought to have a collaborative arrangement with RCA, who had announced their determination to be in the computer business. This had aspirations and hopes to produce beneficial results, but contained a number of disappointments. In 1968, after some pressures, the British Government felt that the ultimate merger should be fixed between ICT and English Electric Computers, which was the other competitor in the computer age, and this was secured or achieved in 1968. That then led to the company which is now ICL.

The strategy was right because it was quite obvious that a country like Great Britain with a relatively small market couldn't possibly sustain a number of companies in competition in computers. But of course the very fact of seeking to have mergers and amalgamations did create enormous problems, because the approach of engineers, the techniques that were used, the systems of administration, the systems of costing were quite different within each company merged or acquired. And a tremendous amount of management time was spent in seeking to rationalize, to harmonize the various sections and various groups involved in the company, which might well have been better spent in other directions.

I suppose I would say that IBM is the company it is because it hasn't actually merged with anybody. It's grown out of its own resources. Why ICL has had a number of special problems is because it hasn't done that. It has acquired and amalgamated with people. And my own experience in its many activities did confirm in my mind that trying to get people to work together when they'd come from different roots is extremely difficult and time-consuming. But nevertheless it was accomplished. We did, and we do have an ICL--a well-knit company with people who have forgotten the various roots from which they came, and strive together to do a good job for the country and for its customers. But nevertheless, there were many extremely complex problems involved in the technological products with many, many teething troubles, which took an enormous amount of time and cost to get sorted out.

TOMASH: What about government involvement?

HUMPHREYS: The governments--the British Government particularly--were generally helpful in securing and supporting the evolution of the industry in Britain. Britain has rather a record in history of having good ideas and somehow not securing the best advantages from them. There's no doubt in my mind that the many tremendous steps in the advancement of the art and science of computing did stem from Britain, and we can claim many firsts.

Mr. Charles Babbage could be identified as having the first concepts of a computer, but as the appropriate technology was not available, his ideas were too soon. But in many other respects, many things were done in the '50s by real pioneers in the art of computing which ought to have given perhaps a better position than the country secured.

However, in all this activity, nothing has been, I suppose, more exciting or more inspiring than to be involved in the development of this industry.

My own part in it was very fortuitous, I think, because back in 1958 or '59 with the merger of the two punched card companies in Britain, I found myself responsible for planning the integration and amalgamation of the two companies with the then Managing Director of the company. I was very much involved in 1961 and '62 with the negotiations and the arrangements with RCA. I became responsible for product planning and corporate planning in 1962, and had a hand in the acquisition of EMI computer activity and Ferranti Computer Division. And one of the things that pleased me very much is that after having acquired the Ferranti Computer Division and EMI's Computer activities and because of the arrangement with RCA had a large mixed bag of computers to offer to the marketplace, we were able to put all of the expertise and techniques together and came out with an entirely new range of computers which was the 1900 series, and I was responsible for the planning of this. The company then decided that since I'd been responsible for the plan of it, it mightn't be a bad idea if I was then responsible for going out and marketing it and selling it. And I was appointed Deputy Managing Director of the Company in 1964 to do that very thing.

In 1967 I became Managing Director of ICT and was very mu ch involved in the merger between ICT (of which I was Managing Director) and English Electric, and was concerned with the government and the interplay of the

personalities and, as it happened, with the Plessey Company which sought to be associated with the company--ICL.

Having gone through one stage of many incompatible computers to consolidate them into one comprehensive series--the 1900 series of computers--we had to put together English Electric Computers Limited, which itself had a wide range of computers, the latest being a System 4, which was incompatible with the 1900. So we then found ourselves marketing two lots of incompatible computers with another series of challenges for management. I suppose it was quite an interesting and significant development for ICL that in 1976 it was able to acquire the international business of Singer, which gave another dimension to the development of the company. We now find ourselves as a fairly significant organization in Britain but suffering--temporarily, I'm sure--the scourge of the present policy of the British government and Mrs. Thatcher's trident: the three prongs of high inflation, the high value of the pound, and the high cost of interest. And the three prongs of that trident, when they're stuck into you really hurt. But otherwise we're sure it's only a temporary setback and that the potential of the business goes to infinity... to be worthy of our share in this tremendous industry and business which should create a much better world for everybody...

TOMASH: Arthur, I wonder if you could cover a couple of points that occurred to me when you were talking: how big was British Tabulating Machine Company at the time that the contract was severed with IBM?

HUMPHREYS: Very small. The revenue from all sources was around 5 million pounds, which in those days would have been about 14 million.

TOMASH: And in comparison with IBM at the time?

HUMPHREYS: IBM at that time, at the time of the settlement, was around I think $400 million. And it's maintained that ratio ever since, I'm sorry to say!

TOMASH: When you joined the company in 1940, how old were you?

HUMPHREYS: I was 23 or 24 years old.

TOMASH: So it was really at the start of your career. And your schooling had been in law?

HUMPHREYS: I was in law. I went to a Grammar school and my formal education finished around about 16, but I served an apprenticeship in the law, which I found was very salutary to me, because as a very young man I was mixed up with lawyers. I was able to confront three judges of the Supreme Court--I was able to see Masters of the Supreme Court--I got to know King's Counsel, and other counsel, and the learning of the legal profession I found was a very good educational background for me, and probably was more valuable than going to university. I think working in the legal profession, which I did for those seven years, was as good as a university education.

TOMASH: You mentioned that UNIVAC had shipped a machine to the Bureau of Custom. Was that in the U.K.? Was that the first UNIVAC to come into the U.K.?

HUMPHREYS: No. That was in the United States.

TOMASH: Oh, it was the Census Bureau.

HUMPHREYS: That's right. I meant the Bureau of Census.

TOMASH: Okay. In your own career path I thought it might be good to review the positions you held. You started with British Tabulating...

HUMPHREYS: I was the company registrar. And then in 1951 I became the Assistant Secretary-Commercial of the company. I had then little to do with share registration, and my commercial activities and responsibilities grew. I was responsible for the contacts with customers, the pricing of the products, and the terms on which the equipment

should be supplied. And I generally had a feel for the various factors. In 1958 I was asked to head a team to put the two punched card companies together, which were Powers and BTM. There wasn't any precedent for merging two companies so this was an interesting experience. And as soon as the merger had been completed and we had a new company, ICT, I was appointed the manager of commercial services, which were the commercial activities of both companies. I think in 1961 somebody thought it might be a good idea to combine commercial services or commercial activities with product planning and corporate planning, and this was my next appointment.

In 1963 I was appointed to the Board of the Company as a full time director. And in 1964, as I mentioned earlier, somebody thought it was a good idea if I marketed and sold the equipment I had helped to plan, and I became Deputy Managing Director of the company. This lasted until 1967 when I became Managing Director of ICT.

In 1968 there was the final merger of ICT and English Electric Computers. I was the first Managing Director of the new company and I held that position from 1968 until 1972 when I was made Deputy Chairman of the company. And in one sense I still am the Deputy Chairman of the company, although in 1977 I partially retired and no longer have a full time executive post, but I'm a non-executive director of the company but if and when the opportunity presents itself I operate as Chairman of the Board.

TOMASH: One of the most interesting aspect are questions about the various people that made these things happen. I wonder if you would discuss the early Managing Directors at BTM and at Powers.

HUMPHREYS: Yes, certainly. The first exposure I had to the board and the direction of the British Tabulating Machine Company was very interesting. The chairman at that time was Raleigh Phillpotts, who had been one of the founders of it in 1907. It's interesting that he was chairman from 1907 until he died in 1949. Just before he died he was responsible for ending the license agreement with IBM. Mr. Thomas J. Watson never found himself comfortable with Phillpotts. T. J. Watson, Sr. was a very proud man and in 1919 he came over to the U.K. to see what his licensee there was up to. He had an appointment to see Mr. Phillpotts in some solicitor's office in the city. Mr. Phillpotts was in fact a lawyer. Mr. Phillpotts kept Mr. Watson waiting for half an hour, and he was then never forgiven for that.

They didn't meet again until, I think, 1937, and Mr. Watson, Sr. was taking the waters at Wiesbaden. The British Tabulating Machine Company wanted to issue some more stock at that time, and Mr. Phillpotts went to see Mr. Watson to see whether it might be possible for the royalty payment, which was 25% of the revenue to be reduced slightly so that it might enhance the opportunity of placing the stock. Whereupon Mr. Watson said, "Well, if you have any difficulty, Mr. Phillpotts, in placing any of the stock, IBM would be delighted to pick it up." Whereupon Mr. Phillpotts said, "Mr. Watson, to sell you stock would be the last thing I would ever do." And it was on these sort of personal relationships that many important business situations, in fact, stem.

T. J. Watson was always, I think, courteous, but he was always unhappy in his dealing with Mr. Phillpotts, which certainly didn't help the development of the business.

Now, the board of the company, the British Tabulating Machine Company, of which Mr. Phillpotts was chairman, really had the same people on it for about 30 years or so. And so it's interesting that board members and chairman seemed to have a much longer period of office than now is likely to be the case.

The managing director of the company...The British Tabulating Machine Company didn't really have a Manager Director until 1944, when Mr. Victor Stammers, who had been Sales Manager of the company before the war, and was a distinguished airman, came back from the Air Force and became the Managing Director in 1944. He had many visits and very many associations with people in IBM to further the interests of the two companies. He had a special colleague, Mr. Cecil Mead, who eventually was to become the Managing Director of the company.

On the Powers side: Powers started by being a licensee of Remington Rand in the U.K. and was created and sponsored by the Prudential Insurance Company of the U.K. It was taken over by Vickers after the Second World War. Vickers is a significant company in heavy engineering, armaments and shipbuilding and military work, and Vickers thought it might be good for them to recover from the wars and armaments and become involved in punched cards and accounting machines which seemed to them quite rightly to present opportunities for growth, and I

suppose one might say, change swords into ploughshares. But it was clear, I suppose, to them that two punched card companies couldn't easily survive, so they merged in 1958.

Ferranti Ltd. was a very interesting company, because they were very much in van of Britain's first computer activity and Sir Vincent Ferranti was a very distinguished gentleman. The Ferranti company always had the policy of recruiting the highest level of technical skills into their company. Their general motto was "Foremost into the Future"... But again, although they were very technically excellent, they did not have too much experience in marketing and selling commercially. So it became quite significant and helpful to both companies when their computer department became part of ICL, or ICT, in 1963.

On the political side, I used to have a number of meetings with politicians. Mr. Harold Wilson was the Prime Minister. He reckoned that as soon as he took office in 1964 that the first thing he did was to determine the policy of having a British computer industry. And when I used to meet him he used to ask me, "How is my company going?" Sometimes it was helpful to have support at the highest level of government.

Mr. Wedgewood Benn was the Minister of Technology for quite a long time in the Labor Government of 1964 onwards, and played a very significant part in bringing about the ultimate consolidation of the computer companies in Britain into ICL.

There are many factors about these people. Sir John Clark was the Chairman of Plessey, which was very much involved. Colonel Maxwell was the Chairman of the Powers company, and played a significant part in securing the merger. He served in the company as its chairman. The Lord Nelson was also a part of this activity, and Lord Nelson and his father both knew Mr. Watson, Sr. very well.

TOMASH: Was Powers about the same size as British Tabulating?

HUMPHREYS: Yes, they were about the same size. I might say that was always a factor which consternated Mr.

Watson. He couldn't quite understand how a licensee of his company could allow a competitor even to start let alone succeed. But they were about the same size. I mentioned about helping the plan to put the two companies together. As they were about the same size, one of the most difficult problems we had as a new company was: we had two of everything. There were two Managing Directors, two Technical Directors, two Sales Managers, two Finance Managers, or Finance Directors, and of course not everybody can be top dog. And so it was a very, very difficult thing to try and fit the people in the new company. Inevitably some had a more senior position than others and others had to accept a more junior position. That's why merging and amalgamations create so many difficulties that if you're not very careful, they're so acute as to defeat the real purpose of why one had the merger to start with.

There are many examples where that's happened and led to tremendous difficulties.

TOMASH: Mr. Maxwell from Powers was the first Managing Director or Chairman of the combined ICT?

HUMPHREYS: Yes. He was the first Chairman of the Board of ICL, and he had been the Chairman of Powers. When Powers and the British Tabulating Machine Company merged to form ICT, Colonel Maxwell was the Deputy Chairman. And in 1967, because the then chairman, Sir Cecil Mead, became ill, Colonel Maxwell became the Chairman and he saw through the last merger, which brought together ICT and English Electric. He was succeeded in October, 1968, by Sir John Wall, who had been at one time the Managing Director of EMI. He had been very much involved in, I think, the Public Service, having had a number of posts, I think, in the Ministry of Food. But his significant last role before he became the Chairman of ICL was to be seconded to the British Post Office and he was responsible for turning it into a public corporation rather than a department of the State. And he was the Chairman of ICL until 1972, when for personal reasons he decided to retire. He was replaced by Mr. Tom Hudson, who had been the Managing Director of IBM-U.K., since I think about 1952, and who had been responsible for the successful IBM company in the U.K.

HUMPHREYS: Mr. Hudson worked for IBM in Canada and I think was specially selected by Mr. Watson to head up the subsidiary in the U.K. Mr. Hudson left IBM, I think, in about 1964 and joined the Plessey Company as a director

of, I think, corporate development. And when Plessey acquired an interest in ICL in 1968 as a part of the general factors in creating that company, the Plessey company appointed Sir John Clark and Mr. Hudson to be directors of ICL. When ICL was first created in 1968, there was a rather curious set up because the principal shareholders in form of Plessey Company, who had 20% of the equity, had appointed two directors: Sir John Clark and Mr. Hudson. English Electric company had 20% of the equity and they appointed Lord Nelson and Mr. Sandy Riddell. The government had 10% of the equity and they appointed a fellow by the name of John Duckworth to be their representative. Vickers had I think 12% of the equity and they appointed Colonel Thomas Davies, and also Colonel Maxwell to be their directors. And Ferranti, who had 5%, appointed Mr. Basil Ferranti. The other shareholders--10,000 of the smaller shareholders--were really represented by two non-executive directors: Sir Alan Wilson, who was the Chairman of Glaxo. Sir Alan Wilson was a very distinguished scientist. He had secured a double first at Cambridge when he was only 19 and was a fellow of the Royal Society. The other non-executive Director was Sir Anthony Burney, who was the Chairman of Debenhams, a very large department store. So we had a board of 12. Eight of them represented 64% of the stock, 2 represented the rest, and there was the chairman and myself as the Managing Director, who were the only full time executives on the board.

And of course, it was a curious partnership. Actually we had many problems that arose and were not too easy to deal with in that sort of environment. After sometime, English Electric got rid of their shareholding and so did the Plessey Company, and the Government shareholding eventually passed from the Department of Industry to the National Enterprise Board and they sold their shares, and so the company now finds itself with no stockholder or shareholder having more than about 1% of the equity. And it was interesting too that all those shares were placed in the city of London without any difficulties which I suppose shows that the general public is interested in having shares of the information processing industry.

TOMASH: Right. Just as a matter of curiosity, directors of British companies--are they very active--the typical director, not an executive director, not the Managing Director, but a typical outside director--will he spend a week a month, or a day a month?

HUMPHREYS: A day a month. He will come to the board. But certainly I think, without exception, he will be expected to spend a day thinking about or reading the papers, and would spend a day visiting, because he likes to be interested in the business and to visit the plants and talk to manufacturing men and to salesmen and so on. And he will help in customer situations, but as a total commitment two or three days a month.

TOMASH: And are they well paid? Or is it a token payment?

HUMPHREYS: I would say not well recompensed. The director's fee as a non- executive director in the company, in ICL, it's 3,000 pounds a year.

TOMASH: That's very much like the situation here in the States, too. Being a director is almost a labor of love. There are all sorts of liabilities on directors, on the one hand, and very little recompense on the other.

HUMPHREYS: Right.

TOMASH: I was curious as to whether circumstances for a director are similar to what we have in the States. Turning a bit to some of the philosophy and strategy behind the company, you touched on the role of the government, the interest of Harold Wilson personally and so forth. Would you talk a little bit about the influence of the government on the formation of ICL, the role of civil servants, and the government's involvement in the negotiations, and so on.

HUMPHREYS: Yes. The Labor Government, I think, sort of spurred on by Harold Wilson, were very much in favor of a policy of making Britain technologically competent and efficient and they saw the computer business as a very important factor in that. And so they did have the spirit, I think, of generating circumstances in which the two computer companies--ICT and English Electric Computers--came together. But they didn't really understand too much about it. I can remember, as a matter of fact, in 1965 I think it was, or maybe '66, Cecil Mead, who was then the Chairman of the company (ICT), and I were sent for by the then Undersecretary or Permanent Secretary of the

Department of Industry, who said, "Well, the Government has made up its mind that ICT should be merged and should be a part of English Electric, because the Government feels that English Electric management is far superior." So Cecil Mead said, "Well, that's very interesting that you say that. However my board and our staff don't quite see it that way." We said, "We're not interested in your proposition, nor your decision."

About two or three years later, the government turned around the other way and said the only thing to do was for the able and competent management of ICT to take over English Electric on account of their English Electric inferior management! So that's a little aside or slant on the way in which some people in government at the official civil service level calibrate or fail to calibrate an understanding of what's involved in the management of a business.

I was sent for in 1967 by Wedgewood Benn to ask whether I would be prepared to set up a small team to examine with English Electric the possibilities of introducing to the market a new range of computers if the government put up enough money. And I said yes, I'd be prepared to set up such a team, and he said, "Well, I'm glad to hear that because I've already spoken to Lord Nelson, and he said he'd do it." And so we did set up this team. And they only met for two or three days and they produced a rather sensible report stating that clearly it was feasible to come out with a new range of computers, recognizing that ICL's computers were not compatible with English Electric computers; and was conceivably possible to come out with a new range into which either customers' work could be transferred without too much difficulty. But it cannot possibly be done if the two companies remain in competition. So that really was the trigger to see whether it would be possible to merge the two companies.

I was at one time the--as the Managing Director of ICT--very much against the merger with the English Electric because they had a philosophy of producing computers that were compatible with IBM, and my colleagues in ICT and certainly myself did not believe that that was the right way to develop a computer business. If you're going to copy IBM that seemed to me to give you a poor opportunity in the marketplace, and there was no logical reason, if you were the same as IBM, why a customer shouldn't go to IBM. However, it was a very high running controversy. But nevertheless, we had two incompatible ranges. Clearly, the techniques that are now available simplify the problem a bit and we have been able to make our computers look like other computers by sophisticated electronic

techniques. But what surprised me, even astonished me, was that no sooner had agreement in principle to merge the English Electric business, computer business, into ICT, been established than the Plessey Company said they thought they ought to take over ICT. The Plessey announced that they in turn were going to bid and take over English Electric. That in turn led, in 1968, to Lord Nelson, who was the Chairman of English Electric, going along to see Arnold Weinstock, Managing Director of GEC, and suggested that English Electric and GEC should be merged together, and Sir Arnold Weinstock apparently accepted this. Lord Nelson became the Chairman of GEC, the British General Electric Company, with Sir Arnold Weinstock as the Managing Director.

And so, unexpectedly for me, and not to any liking, English Electric's interest in ICL disappeared to become General Electric's interest in ICL. I was then dealing with Sir Arnold Weinstock and other people in General Electric Company, whereas I thought I was dealing with Lord Nelson in English Electric. And I remember very clearly--I'd come up from holiday in Bournemouth in August, 1968, to have the first Board Meeting of ICL and to agree to certain factors about settlement of monies and considerations in the merger, and Sir John Clark was not present. He was excused as being unwell. But that very afternoon he'd gone off and suggested that the Plessey company should take over English Electric. I remember the following day I was listening to the radio in the morning and there were two events which caused me to jump out of bed quickly. The first one was the Russians had invaded Czechoslovakia, and the next one was that Plessey had sought to take over English Electric.

TOMASH: One small question that occurred to me during your earlier comments: was the license between British Tabulating Machinery and IBM for all the products of IBM?

HUMPHREYS: Right.

TOMASH: Had it been maintained, that would have meant that British Tabulating would have had access to everything IBM did--electronic computers, and so on.

HUMPHREYS: Right. And could only operate in markets other than the United States and Canada. It could not operate in markets in Europe or in South America. It would be limited to the U.K. and to what was the British Empire.

I mean, it's interesting I suppose to reflect back and say probably...the probability was that the license agreement between the two companies infringed every line of the Sherman Act.

TOMASH: Very probably, it would have been impossible for IBM to enforce the territorial restrictions.

HUMPHREYS: That's right. So something would have had to have happened. But I think the British Tabulating Machine Company representatives... they held a very much stronger hand than they realized, and they should have secured a much better settlement in the ending of the agreement with IBM. Mind you, the people... It was just this animosity that operated between Mr. Thomas J. Watson, Sr. and Mr. Raleigh Phillpotts that caused some other adverse arrangements that should be avoided. And that's what I said earlier, how personal issues can affect very major decisions.

There's one thing, looking back...over the history of the British Tabulating Machine Company, and as a young man--I joined it in 1940--what struck me in those days was a rather curious thing, was that the company had to pay IBM 25% of its revenue in royalties. But the arrangement of course had very important qualities. The BTM was able to acquire any IBM product at cost plus 10%. It had lots of patents and knowhow of any IBM product, and could manufacture it. And of course the most important thing of all, the company did not have IBM as a competitor, you see. So one might say it was absolutely worth the money.

But the thing that absolutely staggered me was in spite of that 25%, and able to buy an IBM product, British engineers decided to produce their own tabulator instead of making the 405 or the 407. And what a most extraordinary thing! Why did they want to do that? And that just shows you the sort of tremendous power of this "not invented here" syndrome. That these engineers in Britain could actually be encouraged by the company to prove that they could develop a tabulator quite separately and incompatible with IBM, when they could have had it from IBM as well as any other IBM product as its own products. Had the BTM manufactured IBM products as it was entitled to do, one wonders in the punched card era of 1949-'50-'51-'52 what would have happened if IBM after 1949 had to offer the same products as the British Tabulating Machine Company.

TOMASH: Do you regard this as a failure on the part of management, not knocking those heads together?

HUMPHREYS: Absolutely. But you know, we shouldn't be too critical. I think that these...factors arise everywhere.

TOMASH: Every day.

HUMPHREYS: Every day. But my goodness, it's a factor that management should always bear in mind, not to allow Engineers solely to design product strategy.

TOMASH: I think managements today are more concerned about product cost and about market position. This may simply be due to increased sophistication.

Turning in another direction, would you think back a bit on some of the key people inside the company that have made ICL what it is today--engineers, or marketeers, or financiers--aside from the director level, from the board level.

HUMPHREYS: I think the key people in, say, the marketing activity were certainly Mr. Victor Stammers, Cecil Mead and John Bull in the early '50s; Mr. Basil Ferranti did a pretty good job in marketing as did Peter Ellis; Geoff Cross did a very good job when he became Managing director in 1972. He pulled together some marketing expertise from Univac. In terms of engineering, modest I think were the achievements in the company, before the '60s. But outside the company, one drew a lot from people like Tom Kilburn, and the Ferranti engineers were particularly outstanding. John Marsh was a very good boss of engineering in Ferranti. Peter Hall, himself, who you know was very good as a manager of the total Ferranti computer activity, and an engineer himself. Many, many people in Ferranti were exceptionally good. They made tremendous achievements. Gordon Haley was outstanding, as was Gordon Scarrott. Gordon Scarrott has done some powerful work very recently with a content addressable file store which we have, and

which is a unique product, as well as a distributed array processor.

So there were those. On the financial side: not all that, I think, much to be proud about, really. The BTM did not look too strongly to financial management. Powers-Samas was not particularly strong either. ICT, therefore, was not too strong in financial management and should have been better. ICT got better, but English Electric financial management was weak, so ICL had problems at first in this area. Cross introduced concepts of financial management which served the company quite well. The company continued to try to rely on the best possible relations with the customers, at the same time as having products which were successful and unique...in the marketplace.

One thing in the business which is very difficult, you can have a sort of unique break-through product, but if it doesn't get accepted in general terms across the industry, it's very difficult to sell it. It's like programming languages. Ferranti had a most excellent programming language called NEBULA. No doubt about it. But I mean it had no international status like COBOL or FORTRAN, so it didn't survive. It was rather like Esperanto. It was a very good concept. But if it isn't accepted, then it doesn't survive, you see.

Manufacturing men have done powerful work in the company - certainly Mr. Ongan Kursh as Echo. He did the most significant thing in getting ICT into the manufacturing of computers in which it hadn't really any experience. Naturally, of course, we know computers are very, very demanding in their accuracy and in their precision. But there's one thing which, speaking as a commercial chap, not an engineer and not a manufacturing man, all the mergers and all the acquisitions had in common: none of the products acquired worked at the onset. And this created tremendous difficulties. They worked in the end, of course. But there were a lot of product problems. Not surprising. I mean, I suppose everybody in the computer business was coming out with products that didn't do too well to start with. ...whether they be a peripheral or a mainframe. Because you're asking for a degree of precision and accuracy which is sort of unique. It doesn't matter with a television set if you get a sort of flash across the screen and you've just momentarily lost the picture for perhaps a second. But my, it really does matter if you get a flash across a central processor and you get ten thousand 9s you don't want somewhere! And this is the sort of trouble you're up against always.

So looking back over time, I have had a very interesting opportunity--as I think you know--of getting to know people in the computer business, particularity in the United States. I have had the pleasure of knowing Bill Norris and a number of people in Control Data now for almost 20 years. I knew many people in GE and had a particularly affectionate association with Dr. Louis T. Rader, and I still count him amongst my closest friends. The people at RCA I knew exceptionally well. I still have a number of friends there. We tried together. We should have succeeded better than we did. I've been able to get to know a lot of people in Honeywell. And I also have been lucky enough to maintain a lot of friendly associations with people in IBM, and particularly Tom Watson, Jr. and Al Williams. Jim Birkenstock is an old friend of many years. Jim has always been very helpful, and we have been in a number of helpful negotiations involving patent rights and things to our mutual interest and benefit. UNIVAC people I know very well. I've been lucky enough to have known Bob McDonald for a long time and Paul Lyet. I was very fond of Frank Forster. I got to know Harry Vickers pretty well. Dause Bibby, Tommy Kirkland and Joe Schnackel, when they were with UNIVAC, and so it goes on. It's very nice to have been in this position, getting to know all these people in the United States. As you know, I also know a number of people in the peripheral business as well. I've known you for a long time; and with many have sought to collaborate in various degrees of pleasure with opportunities gained and opportunities lost, but this is life, isn't it?

TOMASH: I'd like to ask a difficult question. Could you contrast the skill level and competence of people within ICL with the people you met in other companies and countries, both competitors and suppliers. From a people point of view, how would you rank the ICL?

HUMPHREYS: At the technical level: higher. But at the financial management, production management levels: much lower. Much lower.

TOMASH: I think it's important to factor into your reply that we all tend to be more critical of our families in our homes than we are of strangers and outsiders. We know our own people better.

HUMPHREYS: But I've always been impressed by the middle level of American manufacturing management.

Whenever I have had the opportunity of going around a U. S. plant, I'd be impressed with the fellow taking me around. He's always seeking some way of knocking some costs off on the product. Now you rarely find that in Britain. A bit more conscious of it of course in the last ten years or so in ICL, but in general terms, that doesn't have the highest priority in manufacturing in Britain. But it's always had the highest priority, I've noticed, in American plants at that middle level, next level down, of management. And I think the system of financial controls has been stronger.

Now...as we go up the scale in terms of the top direction in American business, I do not find that they have any edge at all on the top management in British companies--none whatsoever!

TOMASH: Let me ask another provocative question: both the British government and the British computer industry felt that industrial consolidation and rationalization--the creation of one British computer company--was an important national goal. Everyone worked to that end, instead of letting the marketplace make a determination. To be provocative, isn't it true that in that process, you were diverted? You all paid so much attention to rationalization, that you let Burroughs and Honeywell and IBM and the smaller American companies take your market away while you were busy rationalizing among yourselves and getting merged?

HUMPHREYS: Yes, there's a lot in that, I'm afraid. Of course, like generals writing their memoirs, it's always sort of easy to look back and say, "Well, it might have been different." If I had my time over again, as being involved in the British Tabulating Machine Company, apart from Ferranti, Ltd., I wouldn't have merged with anybody! I'd have cracked on and driven the company forward. And we would have grown like IBM, I think--not on quite the same scale, I'm sure, because the markets are different. But as IBM, they haven't merged with anybody. They'd grown themselves. And as I mentioned earlier when we were talking, the complexes of the problems when you're dealing with two lots of people and two lots of attitudes and two lots of technologies and two lots of systems and so on! And even compensation packages. People have different remuneration. And when you put them together, everybody then wants the best of both! You worry about all this and your mind gets off the ball!

TOMASH: It's only natural that your energies would be devoted to that instead of to customers and the competition.

HUMPHREYS: Right. So I agree totally with what you say, but on the other hand, I wouldn't like to leave you with the impression that the government overbore everything. I mean, it was always left to the Board. They said, "Wouldn't it be good if you put together ICT and English Electric?" They didn't say "You must." The Board decided to do that. We thought it would be in the interest of the shareholders and in the interest of the customers and so on, and in the interest of the people. But the Board did not have to do it. Wedgewood Benn used to say, "Well, we tried to help by using a golden rod." That was his expression...might beat you over the head, but at least it was made of gold. But there wasn't very much gold, I'm afraid. This is another thing which I suppose I've been very disappointed in--that the British government really hadn't understood--if they really had a policy of wanting a British computer machine they should have been prepared to put up much more money. The French government, and the German government, and the Japanese government, and I would say the United States government, really put up astronomical sums of money to lead to the development of the industry. The United States--it's different--but I mean, the Japanese--and even now in term of VLSI, there's hundreds of millions of dollars that go into that program. The British governments gave chickenfeed, really! Chickenfeed. The French government poured in millions and millions with not too many results so far. And if you want to do this, you really can't do it on the cheap. So I've been disappointed that the British government hasn't done more, if they had that sort of philosophy...

But of course, all is a paradox. ICL was able to get a grant of 40 million pounds toward the development of its 2900 series of computers, and that was given to it by a Conservative government, or at least was agreed to be provided by a Conservative government. And one usually identifies them as not wanting to get involved in what they call "lame ducks" or something. But the Conservative government now in Britain has had to put up astronomical sums in British Steel and British Leyland and other aspects of nationalized industries and I'm quite sure the political theorists are now rethinking the whole thing.

Nationalization used to be thought to be a panacea to problems. If the private industry won't put up the investment, then it's up to the state to do it. But as soon as the state does it, it's hooked because the workforce tends to regard

the state as a ready source of money for increasing the level of remuneration. If they support their unions who want more money for their members and threaten to go on strike, it's a strike against the government and the government tries to persuade itself that it should keep out of it, or leave it to management; and we know that's impossible. Government should keep out of the thing, and let the market forces take over. But create an environment in which business can prosper. Not take it over. Because business is a very complicated thing to do, and Britain, the U.K., is probably the most difficult business of all for anybody to manage. So why should...politicians get themselves elected if they've got any particular expertise about business. And one should not imagine either that the civil service knows too much about business. They don't really. And yet you take the same line: "What does the government do? Why doesn't the government do this?" They can't! Far better to leave it to--if you're going to have a capitalistic society, well, let it operate. If you're going to have sort of a socialist society, well then operate it. So, up to a point, I think partially...some aspects of Mr. Wedgewood Benn says, "Well, what we've done, we're halfway in between." And any compromise between the two is usually the worst of both worlds. So, you know, there's some intellectual logic in that.

But British people tend always to want to find the sort of compromise, or the middle ground. And therefore, I feel at the political level it could well be that if a new party called Social Democrats is formed, they would probably do well. Because I think the British people are a little tired of the confrontation politics. The government gets in and does things and then later on when the opposition takes over, they reverse things that have been done...and I think that the British people like to think that there are not any extremes. We live in a climate which is not extreme. It's a very pleasant climate in England. The weather's terrible, but the climate is great. You don't ever get extremes of heat; and you don't get extremes of cold. Just the middle stuff. And I think that affects the attitude of the people. Britain will always sort of, British people will always sort of, conquer, if the ultimate gauntlet is thrown down. I remember someone saying that in the last war. They look for leadership to give them some point to which they can respond. That's what I think is missing. And it could well be that the leadership that comes from the center party, if really well put over, could make a lot of difference.

TOMASH: Another provocative question that I'd like to explore: you mentioned that technically ICL was quite

advanced, and quite up to speed with other companies around the world, that British engineering is of the finest and highest caliber. But the thing that seems to be absent in the British economy is the small dynamic company. Is the spirit of entrepreneurship lacking in the British economy, or the British people?

HUMPHREYS: It's a little...not quite so sharp, but it's not altogether gone. There are very many examples of smaller companies doing entrepreneurial things. So I wouldn't be too pessimistic about that.

One thing which interests me about the development of management is that, how can one in a large company, sort of accumulate, or encourage this entrepreneurial spirit? One can. You find it over here, of course, in the United States...happening all the time. A group will work for a company; they will leave; and they will set up a business for themselves. And then they prosper. You hear about the ones that prosper. You don't hear about the people that didn't. But very often when they don't succeed, they find that what they lack is the virility of financial resources. So then you often find that they then have to sell themselves back to a bigger company again. So I've always felt that it should be possible for a large company to encourage that entrepreneurship and avoid a group going and then having to come back. And that's always interested me. But in Britain...

TOMASH: Do you think this is an aspect of the economic environment that the British government hasn't developed, creating an environment in which little companies can prosper?

HUMPHREYS: Yes. I mean, they haven't got the right environment for little companies to prosper. The present government--Mrs. Thatcher's government--is seeking to do something about it, but the words haven't actually yet equalled...at least the actions have been disappointing in relation to the words. But as soon as politicians start battling on business, you have employment protection acts or legislation, you see. And of course that's anathema to a small business that just wants to take on a couple of fellows. He doesn't want to be involved in a whole rigmarole and a lot of bureaucracy. And you've got race relations acts and things, and they start mumbling about discrimination and things. They come out with factors that--the very regrettable high level of unemployment in Britain--that black people and Asian people may find it more difficult to get jobs, or they are more easily thrown out of work. Well, it isn't because people are discriminating against blacks and Asians; it's that they haven't got the same

qualifications. And if you're a small businessman and you want to take on somebody, you've got to pay him; it's not that "you're black and I don't want you." But you say, "What can you do? Have you got a degree in engineering? Are you a good shorthand typist? That's what I'm looking for and I'm not looking for a color." And if somebody comes in and wants a job and he's black and he can't read or write, how does he expect to get a job? And so on.

But I'll tell you--we were talking earlier on about Hong Kong, which I think is an absolutely fabulous place. It is the almost the last example of what it was--the spirit there--that created the British Empire. Millions of people inspired to work. This leadership business...if you could just persuade the organized labor in Britain to agree, say, for three years, no matter what management does, to have no industrial action, Britain would be transformed into the most prosperous country in Europe. That's all. I mean, we could afford all this business with the National Health Service, and you could afford to have the houses... And you could afford to have roads and schools and so on. But there they are squabbling to carve up a smaller cake rather than make a bigger cake. Maybe it's simplistic stuff, but...

TOMASH: I've thought a bit about this matter. One of the characteristics found near a community of small thriving businesses is that they surround--they always seem to be built around--a major university. You find them in Boston near MIT and Harvard; you have them in northern California around Stanford; you find them here in Los Angeles right around UCLA and USC and so on. But that doesn't seem to happen around Manchester or Cambridge.

HUMPHREYS: Perhaps not to quite the same degree, but it really does happen. It does happen, sure. There are many, many companies in and around Cambridge... Oh yes, sure. And Manchester, as well. And Birmingham. I think it's the same thing.

TOMASH: So, perhaps it's just that the economy is smaller.

HUMPHREYS: That's right. That's right. Sure. You've got to have sort of a light that shines that people will sort of go to and perhaps the light is in fact leadership. I suppose it's not entirely unreasonable, with all the sacrifices that were made in the war, that one expected that things were going to be better. But now one suffers in the fact that the

great majority of the workforce has never actually known adversity. I mean, I have experienced--and you as well--what happened in between the wars, up to a point, and I know very well that in the '30s in Britain, man's most important asset, after his wife and family, was the fact that he had a job. And he wouldn't do anything that would prejudice that job... But now he has developed a sort of attitude of mind that somehow his job and the company doesn't matter. I want to be paid more money, and if I don't get more money, I'm off on strike, attitude and so on; and so he's damaging the company that employs him. And that's pretty absurd! And... I think it's because the 36 years of relative peace has lulled people into a sort of sense of false security; but it can't go on like this.

Another thing I suppose about it is that the great majority of the workforce in Britain, the great majority of people--I mean, they haven't fundamentally changed.

If you've read anything bad about Britain, it's usually on the front page, if it's good, all the good things are on page 27 somewhere. And this is a pity. Industrial relations are very much better than they were. But I think the fundamental people to blame--I would say--are the politicians over the years. I really think that with the aid of God we were able--and our allies--we were able to come through the war virtually with the British Empire intact, and here we are, after 36 years, it's gone down and down and down and down. ...You would have thought, unlike Germany and Japan that were shattered, and they've made a tremendous recovery, that Britain which was not shattered, would have got off to a much better start! Yes.

TOMASH: Another provocative question: Is there an independent software industry in Britain?

HUMPHREYS: Oh, there are many software houses, and in general terms, most of them have prospered. Also there's a government-sponsored thing, that's the National Computer Center, and they've done some pretty good work. I mean it was set up by the government, but it's now...it has to be profitable in its own right, and that's in Manchester, and they've done some pretty good work. But there are many software houses and they are very varied. ICL has a software house that's totally owned, which is Dataskil. That's probably the largest software house in the U.K., and quite profitable, and I think has a good record of doing pretty good work. There are many, many software houses

that are good. There are independent computer bureaus. Some of them are part of larger companies like British Oxygen Corporation, which holds a bureau. Some of the banks do.

I'm not happy with the government and its use of computers, because they're not an efficient user of computers. They're not. And I can give you an example of this. Just recently, just before Christmas, ICL was given an order to handle the computer systems for the Inland Revenue--you call it Internal Revenue, you see. I mean, this has been going on since 1964. In 1964 there was a pilot installation to handle the income tax of the nation, and I remember Mr. Wedgewood Benn giving a talk in which he referred to this and he said that "This is it. This is the policy of the government, and in the future the payment of your income tax will be an exciting electronic experience." And here we are 17 years later and they still haven't actually finalized the system. And now that we've been given an order for some of the mainframes, it's going to be progressively introduced over the next five years or so. And I mean, now income tax calculations are worked out with pen and paper, and it's natural to be automated. That's very disappointing. And some of it comes about I think because of this continuing confrontation with the political situation. When a government comes in and changes the tax structure, so all that was done before has got to be done again. I mean, we went through I don't know how many pension funds and pension schemes; where one government wanted to do it all and starts again on a new scheme. And partly that's happened in terms of income tax, which is a pity. That's what happens. But the government is not an efficient user of computers.

I used to try to find out the number of computers that are installed in the federal government here, but--it was astronomically larger than in central government in the U.K. but perhaps--if you discount that in this country you've overdone it, Britain is still lagging behind. ...The French are pretty sophisticated. They've done more in government with computers. I'm full of admiration for the civil service of France, because they're all pretty highly trained people from the Ecole Polytechnique, and they tend to be more identified with the business government. Whereas in Britain, I think that most of the senior staff in the civil service have had their schooling in the atmosphere of Oxford and Cambridge and Eton and Harrow without getting their hands dirty in business. And I think that's a factor which doesn't do us too much good.

TOMASH: Turning to another subject: ICL has been relatively unsuccessful in penetrating the U.S. market. Would you comment on that?

HUMPHREYS: Yes, I think the problem really is--and I agree with you, its been very disappointing--that the market is so large and we've never really been able to match in financial terms the resources necessary to take a crack at it. I think it misjudges the situation to say, "Let's concentrate in the New York area," or "Let's concentrate in California," or somewhere. You tend, in terms of, certainly computer systems...if you're dealing with a company, he wants coverage in all states and you've really got to be able to have the service there. You've got to set it up properly, and it takes a helluva lot of money, and if you haven't got the money, you're better off not to start. To be only a quarter of the way there is almost guaranteed to be lacking in success. If you are clever enough to figure out some sort of discrete product or application which is capable of being done and marketed, perhaps you can do better. But I'm not sure whether anybody outside the United States environment, from Europe or elsewhere, in computers, have made any particular stronghold in the United States. Of course, one has to reflect the reality of the fact that the United States companies in computers are very, very strong, and if you're not up against the main one, you're up against other competent companies. So it's quite a real tough assignment.

Also, I think I've been disappointed because one's up against a tariff barrier. In certain sorts of advanced things, we do have hopes of being able to get some orders for larger systems with, say, content addressable file storage, which is quite a unique thing, and also with a distributed array processor. But we have come to deal with large U.S. government set-ups, and even into the buy American act. So taking it all around, it's rather difficult. We did hope that we could do something with point-of-sale, and we've reached some measure of success, limited... As a result of the Singer acquisition, we picked up some business here. But it's not really anywhere near satisfactory.

TOMASH: What was the rationale of the Singer acquisition?

HUMPHREYS: We were not interested really in their United States business. But they had got a number of customer accounts in international markets, and where they were fairly strong, we were not quite so strong. And it was a customer-base on which we could build. And we could also provide the services which--it was Singer's decision to

get out of it--they weren't able to do. But we were quite happy with the customer base, and the opportunity to service Singer systems in European markets, and in others--in Australia, and South Africa--and they're quite good. And we've enhanced the product.

TOMASH: You're able to follow on now with ICL products?

HUMPHREYS: That's right. Singer sold their base in the United States to TRW. So that was sort of a curious set up. We tried to get business with new replacement products and we might be successful there. But anyway so far its been disappointing. And I think we should have done it better. But I think the obstacles were very formidable, and without the appropriate financial resources we weren't smart enough to say, "Well, we haven't got enough financial resource, so we won't try." What we did was to go out a quarter of the way alone. Rather like the mistake that generals always make in their engagements and operations. It's always too little, too late!

TOMASH: And your point about other companies, no other foreign companies have done it either, is a very telling point.

HUMPHREYS: There's something special, isn't there, about the computer business. You're not supplying a motor car or a washing machine or a television set. When you are involved with a computer system, you are involved in the totality, usually, of a customer's business. It's supplying some hardware that's no good without the appropriate software; its systems support; it wants to be maintained; the systems have to be developed; he wants the continuity of supply; the continuity of enhancement. Its unique in this way. And that's why it's a very exacting business any very expensive to develop the marketing capability.

TOMASH: There are a number of questions that crossed my mind as you talked. One was the formation in the late '60s of the European Computer Company with the Dutch (Philips), with the French, and with the Germans (Siemens).

HUMPHREYS: That's right.

TOMASH: ICL did not join that effort and ultimately it failed. Would you talk a little bit about that, and your own attitude towards it?

HUMPHREYS: Sure. Perhaps I can go back a little bit before that, because its been almost a consistent pattern. In 1962 and '63, I was involved--and a lot of other people in my company--in seeking discussions with the Bull company in France. They had a punch card business in France and in Germany, and it seemed quite natural that there ought to be some affinity of interest. The Common Market had just been launched and Britain wasn't in it, and there was no reason why we shouldn't be able to do something there. Well, that didn't go too well. There's no doubt that if you're trying to make an arrangement with a European company, you are up against this formidable problem in terms of the language. It doesn't matter whether they speak English fluently or whether you happen to speak French fluently, there are difficulties, because there are so many nuances in understanding one's basic language. But however, one hoped very much--certainly I did--that we could come to some arrangement. But in the middle of it all, the Bull company decided to sell itself to General Electric of America. So that sort of frustrated that.

General DeGaulle happened to be snoozing one afternoon when that happened, and when later on in his atomic energy or nuclear energy program he sought to get a 6600 computer from Control Data, and was told by the United States government he couldn't have it, he decided, "The hell with this Bull & GE company." He would set up a French company. He caused the creation of Compagnie Internationale Informatique (Cii). Well, that didn't prosper either, too well. And in 1970, I was mixed up with a number of Cii people trying to work some arrangement between Cii and ICT. And this looked to be highly possible, except they had reached the view that if you can have a product--and they've got one called Iris--you ought somehow to try and be compatible...with IBM, and we had this controversy...not quite seeing that that's the way to develop products. Well, this work made some progress, but quite suddenly Cii decided that they'd make a deal with Siemens. That was largely triggered off because Siemens had got a quite comprehensive arrangement going with RCA, and when RCA ducked out of the computer business Siemens were really left high and dry.

So they decided it might be a good idea if Siemens and the French formed some association, and they made it clear this was happening. Philips said, "We understand this as an arrangement; we don't know what it is, but we want to join it." And that found expression in the company called Unidata. Now it was a troika with the three parties, all working away. And we in ICL had a number of talks, I did, and my Chairman and others, to see if it was possible for us to join and I was sort of encouraged in a way by the press--about every hour it told me you're missing out; you ought to get involved in all this. But try as one could, there was no way in which one could fight one's way through the attitudes and the philosophies, the product philosophies and so on--three companies, three languages, three different sets of management. It just became impossible.

And then, of course, it broke up. It broke up largely because of the French; they broke a treaty. Whilst they had an agreement with Siemens, they were secretly cooking up a deal with Honeywell, which wasn't quite as, you might say, as ethical as you would expect. And so it all broke up, and as far as Siemens was concerned, the last thing they now want to do is to have any collaboration with anybody, because they'd been let down first by RCA and then by this Unidata situation, you see. All the people that used to say to me that I missed the opportunity to be involved in it, with Unidata, when it all collapsed, they didn't come along and say, "How smart you were not to be involved in that." I was reminded of what John Kennedy said about the Bay of Pigs venture, "Victory has many fathers, but defeat is an orphan."

I knew a lot of the people in Siemens and I thought there was a good chance of working with them. I thought there was a good chance of working with the French. I thought there was some chance of working with Philips. But working with the three of them really wasn't possible. And they all persuaded each other that there were no difficulties, you see. And I used to see the way they operated; we'd have meetings...and it was all very charming. But it was unreal. It you're going to have a company, somebody's got to be the boss and somebody's got to call the shots. "We're going to do it this way." It's almost impossible when three of you have got to agree. This is one of the problems, I suppose, in the frustrating, incomplete success of the Common Market in Europe, because there are now ten nations and they all have to agree. I mean, each country tends to look at its own sectional and national

interests, and there are certain things... We don't like the way this common agricultural policy operates; and the French don't like the way Britain turned in the fishing business; and the Germans don't like this; and the Dutch don't like this. You know, it's all pretty difficult.

So anyway, that was the situation with Unidata. I mean, Unidata...the only thing they ever did was to use the name Unidata. They never really had any unity. But I think Siemens have tended to prosper a bit in the computer business. It is such a powerful company that even though--depending on how you do your accounting--they would lose money in computers, it's not really significant in the totality of their operations.
It's the French company...I mean, I think that the arrangement with Honeywell was quite a good one for Honeywell; and I don't know what's going to happen in the future, whether they will continue as now, or whether the French will gain full control. They have the majority of the shares--53% I think. But I think Honeywell will sort of call the shots and take care of the policy and other aspects and financial things. But I'd say that it's worked out quite well for Honeywell.

But today, you see, the French, the Bull Company, they went to GE and that didn't work; and then they started their own company, and then it goes to Honeywell. They poured in many many millions and were not entirely successful.

TOMASH: What's your current view of the Japanese in the computer business?

HUMPHREYS: Oh, I think frightening, because their total investment in the technology for the future is, I think, unexceptional. Goodness, gracious, me! I mean, is exceptional! The money they're pouring into Very Large Scale Integration. And there was an article yesterday in the Financial Times about the future. But I would say the Japs are probably, in terms of Very Large Scale Integration, ahead of the game there. Now, they've got a weakness in terms of software, I think, and application software, and marketing experience in the Western World. Western business is perhaps difficult for them to comprehend, as well as what is special about the computer business... You can sell a car, and you can sell a television set, and a tape recorder. It's simplistic. But when it comes to computers, you've got to

do more than that. But I would say in the next five years, when they have all this technology and add it to their ability and their determination, they're going to be a very significant threat. And I would say that they'll probably start...they have a test marketing operation in Australia. And I would say they'll start in the United States in a more purposeful way, and in Europe, they'll probably be more slow in getting involved in European countries because of the language barrier, at least the language of computers in English. But when you're dealing with the customers, and you've got to speak to them, if you're a Japanese to speak in French, that's pretty difficult for them.

So I'd say that it really is, I think, as I understand it, what they are doing in terms of technology is frightening. Now, what do you do? Do you seek out partnerships and join them, and so on? I think there might be merit in having a sort of a partner with a Japanese company. Many U.S. companies do have partnerships somewhere--I don't know what the current state is--but I think it's rare for foreign companies to have wholly owned subsidiaries in Japan.

TOMASH: Yes, that's so. Although both IBM and NCR have their own subsidiaries.

HUMPHREYS: But Burroughs has an arrangement.

TOMASH: Burroughs now has their own subsidiary as well, but they did have an arrangement. Honeywell has an arrangement. Univac has an arrangement.

HUMPHREYS: Right...of course, concentrated first on their own market, and they've done pretty well there, with their government policies. But I was always very impressed with the MITI organization. It seems to me that that was a kind of corporate planning on a national scale. And those fellows were able to organize the collaboration between industry, government and banks. It was a very remarkable thing. And MITI is substantially responsible for the success...

It's a funny thing about a number of countries, in the undeveloped world particularly, that they somehow see this computer business and they say "We want to make them. We want to manufacture them." Isn't that a sort of

attitude which we used to have 30 years ago? The last thing they should want to do is to make them. They should want to use them! But making is the first thought. Can you imagine making computers in some of these developing countries, when they've got so many other problems?

TOMASH: We certainly have evidence of this. For example, the Brazilians plan to become self-sufficient in computers. They really are trying to do it, at great cost to their own economy, of course. But they're pushing ahead.

HUMPHREYS: Well, they've got a lot of people there, and I suppose they've got to find work for them, but it really doesn't make too much sense for, say, Kenya to make them, or Egypt, or Australia. You know, where you've got a small population.

TOMASH: It doesn't seem to make much sense, but in the Third World the underdeveloped countries...we find it everywhere. In Eastern Europe, of course, they don't have the money to buy. That's what the Brazilians tell us too, that they don't have hard currency. All the money they've got is going to pay for oil. So they've got to reduce their imports of these expensive high technology products, and that's why they want to make them.

HUMPHREYS: Well, it's such a business, isn't it? I mean, we do manufacturing in India...responding to government, Indian government wishes and requirements, even. But I mean they really haven't got the indigenous capability to produce what you require so they have to import a lot of things which make up a total computer system, and they're concerned about paying for that, and they like to think you can then export. You know, we have asked them why they would expect us to be able to handle the computers that have been made in India when you can make them yourself in the U.K...I understand, I think, the aspirations, but it's misjudged. They really should use them. Of course you don't want to use computers when you've got 600 million people. You don't want to use computers to save labor, do you? But you've got to try to use them to solve problems that can't be solved no matter how many people you've got. But it's all very, very difficult. The emerging nations, they like to do...and they like to think about computers and worry about it, as they insist on having their own airlines.

TOMASH: It's really more than national ego. I had a discussion on this point with someone from UCLA. He pointed out that while it seems like just national ego, he felt that the first thing one of these countries does after it joins the United Nations is get an airline. There is more to it than that. He pointed out that the control of national geography has always depended on the means of transportation available. For many, many years a country was only as big as the distance of a day's horse-ride. For example, Germany and Italy were broken up into little enclaves, little bishoprics, duchies and kingdoms, which are really about the size that you could control with the cavalry. The railroad became the unifying influence for these nations, for a railroad lets you ship armies around and thus control a larger territory. Of course, the jet airplane was the next means of transport, and it lets you control very large boundaries.

Well, to go on to the computer, my friend at UCLA hadn't thought about the computer in depth, but he had thought a good deal about this general subject of what he called communication. Transportation is for him simply "physical communication." And the other aspect of communication that he concerned himself with was "intellectual communication." By this he meant radio and television. A modern native must have physical control of its territory and also it must have intellectual control. And I suppose the computer is part and parcel of that intellectual control, and you've got to have that.

HUMPHREYS: That's right. You mentioned the horse. I was interested about the affinity between the computer industry or information processing industry and the development of civilization in its various stages, and also the speed with which man actually travels, you see. Now you take the 10,000 years or more from the dawn of history until the middle of the 19th Century. Man was limited to the speed of the horse, that was the best he could do. Then he was encouraged to move very much faster by the train, and that lasted for a hundred years. And for thirty years now he's been used to the jet aircraft. Now, you look at the development of civilization. The agrarian revolution--going back to the 10,000 years--there is the horse and land. And then you come to the Industrial Revolution and the train is the most significant factor, and with the electronic revolution, it is information that is capital.

TOMASH: Here we are, it's March 1, 1981, and Arthur and I are having a glass of champagne while we continue our discussion. Arthur, you were talking about Jack Potter. When did you first meet Jack?

HUMPHREYS: About 1957, I think, or '58. I was in the United States for the first time in 1956 when we were working with Laboratory for Electronics and seeking to develop a computer system for the Chase Bank and Jack Potter's company provided some, I think, some paper tape equipment in those days. It was a very interesting concept for the Chase Bank, Diana, because the system was probably more sophisticated than anything the Banks are using now. But the technology was not quite compatible with the demands of the specification as the system had some magnetic tape and drums, but programming was in machine language, and nobody'd mentioned anything about software.

I went to see Jack on a number of occasions. We bought some of his tape decks, and the Ferranti company had used Jack Potter's tapes on some of their Atlas and Mercury systems. So eventually as they came into ICL, I inherited them as well.

TOMASH: He was a very inventive man. Jack developed the first electronic counters in the United States. He had patents issued in the 1940s for electronic counters.

HUMPHREYS: I remember on one occasion his holding up a substantial check from IBM for a patent he had. I think he also holds some fundamental patents on group code recording on magnetic tape.

TOMASH: Yes, he was a very, very bright creative engineer. Yes, he's a man well worth our having this talk about. He has not been interviewed to my knowledge. He built two or three companies and started two or three major things going, but he always managed to limit their growth by introducing many new products prematurely, by refusing to develop management, and so on.

HUMPHREYS: Yes, he could have really gone great guns at one time, but he had that very big contract, didn't he

with MAI, for supplying disk drives and things, and a lot of the IBM compatible stuff, and I think he got into some financial difficulties stemming from that.

TOMASH: The need to lease products caused the financial problems.

HUMPHREYS: But the colleague of Jack Potter that I liked the most, and he's still a very good friend of mine, is Colonel Gray...distinguished colonel in the American Air Force. He was also involved in the Anglo-American Air Force Association, which used to raise lots of money for charity.

George Comstock was another chap that I remember very clearly, and also Andy Gabor, who was outstanding, I think, a tremendous fellow. Jack had a lot of good people. Steve Keene was another who impressed me. They all seemed to leave Potter. Their own inclination was not to do so; they would have preferred to have been made executive vice presidents or something. But they left when they did not progress, and they all did well. Which looks as though that was definitely Jack's loss, doesn't it?

TOMASH: Yes. Comstock and Gabor came out to California and worked for Friden and Singer for awhile. Then Comstock left and started the Diablo company. He and Gabor introduced the Daisy Wheel printer. They were the first ones to bring that to market, and did quite well.

HUMPHREYS: As you know, that other company I'm mixed up in, Data Recording, they had gotten an arrangement with Diablo and marketed those cartridge drives, and they supplied quite a lot of them, and manufactured them in England, too, under license.

TOMASH: In the very early days, there were several attempts to start peripheral companies in the U.K., but DRI seems to be the only one that survived.

HUMPHREYS: Yes. It's in magnetic products and they're still probably the largest in Europe as an independent

supplier of peripherals. They've got a pretty good printer going now. But they now have...arrangement with Control Data, which was sponsored by the U.K. National Enterprise Board, whereunder disk drives are manufactured in the U.K. The company is a subsidiary of Data Recording from a shareholding point of view, but Control Data has the management responsibility. For a long time, of course, DRI was a subsidiary of ICL. I was first mixed up in it in 1957, when the company had just started and employed six people. I remember being told to go and investigate it. It had been started by another man named Coleman, I think it was. And I went to see him, and I wasn't quite sure where Data Recording fitted. There were a lot of other names like Lyons Electronics, and Gresham Transformers involved. But I noticed as a matter of interest that all the books of these various companies owned were kept in pencil! At that time I was the commercial manager of the British Tabulating Company, MC and as well as my job in BTM that asked to be the general manager of Data Recording. I thought I could handle that by going down to that company on Monday evenings. So I used to go down once a week.

TOMASH: Do you have any thoughts on the British mini-computer business? One of the things that has struck me is that with each cycle of development in our industry--mainframe, minicomputer, microcomputers, word processing--one new company or at most two emerge as new major participants. But in Britain you don't seem to have spawned a minicomputer company.

HUMPHREYS: No, not really. I suppose some of the products that ICL manufactures and markets would fit into the definition of mini. But you're quite right. We haven't. There are dozens and dozens in the United States. But not only in Britain; I don't know of any mini companies on the continent of Europe either. There's not a German one, as far as I know...except I mean, I wouldn't call Nixdorf computer a minicomputer, really. Although there are a few in Germany upon second thought.

TOMASH: In France there is SEMS.

HUMPHREYS: Yes. That was really what was left over from the original Cii, when the other part of it had this arrangement with Honeywell. I suppose Philips in Holland manufacture, I suppose you'd call them minicomputers.

They're 350 is the range, I think, and 450 range. They're sort of minis. Well, there are dozens and dozens here in the U.S. and they all seem to have done very well.

TOMASH: Yes. Of course over time they broaden their base. Hewlett-Packard really started in minis, but is now into at least maxi-minis; those are quite large systems they provide. And DEC's new Vax 70 system is really quite a substantial and major system, hardly a mini. But on the other hand, there are many companies like Computer Automation, and General Automation who remain strictly in the mini business. Is there something in the environment, or is it simply size of market?

HUMPHREYS: Oh, I'm sure that's the most important factor: the size of the market. I mean, the United States is unique, you see. People who have never been here don't quite understand what it really is. I mean, it is an association of 50 separate states, and they've got very much an identity of their own, and they're very jealous of the other states, but nevertheless the homogeneity is secure so that the market is continent-wide--right across the continent, largely because (and fortunately?) the English language was adopted, so everybody understands one another by speaking English. And the law applies pretty well consistently, and you don't have any problem of tariff barriers between one state and another. This is quite different in the common market of Europe. I mean, even now it's sectional interests. It is a problem like German and French language and the English language. The terrible turmoil that has to go on in Brussels and other places, with...I mean, the documentation has to be produced in six or seven languages. And what an expense and waste of money that really is.

Now, all these advantages are available to United States business and it's very much harder to achieve the market goals for any one country in Europe.

TOMASH: Does the division between the countries--the French, the German, the English--still linger on? From that point of view, would they rather buy an American product than a European one?

If you're a German, would you rather buy an American product than a French or English product?

HUMPHREYS: Oh, yes. Indeed.

END OF THE INTERVIEW