

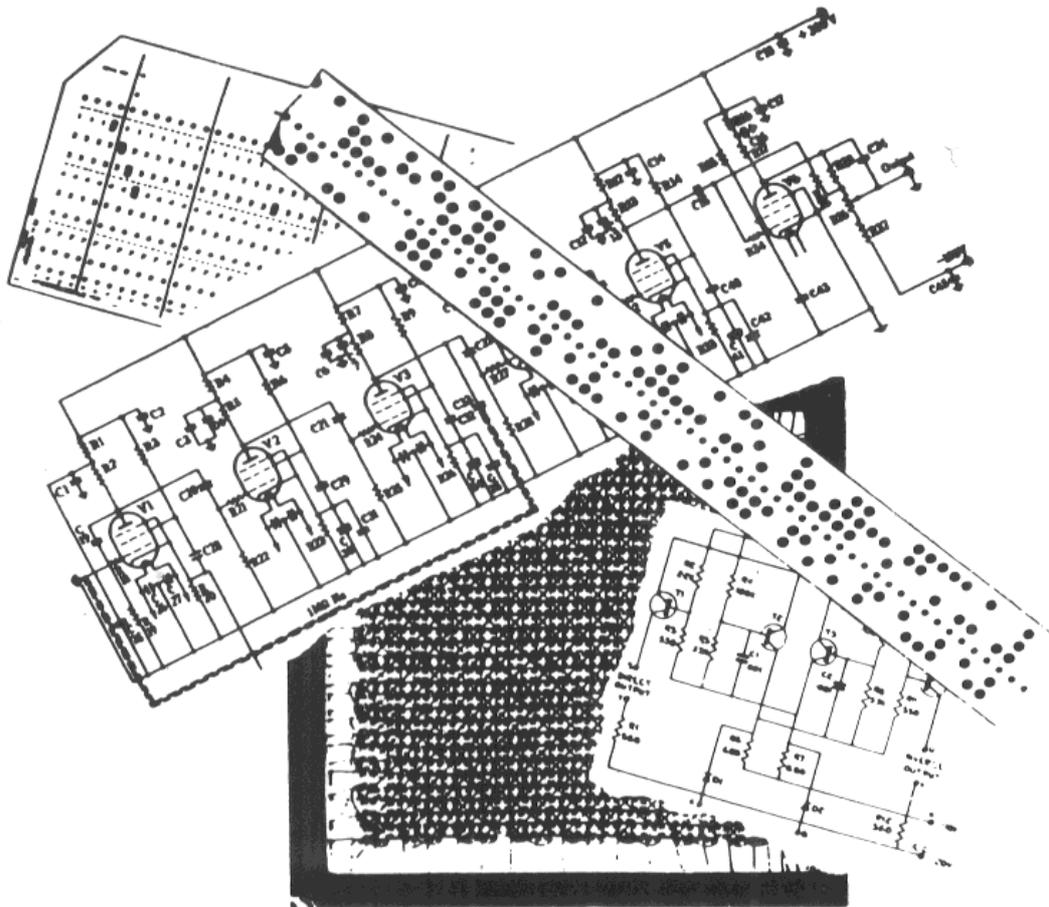
Issue Number 35

Autumn 2005

Computer

RESURRECTION

The Bulletin of the Computer Conservation Society



science
museum

 **BCS**
THE BRITISH COMPUTER SOCIETY

THE MUSEUM
OF SCIENCE &
INDUSTRY
MANCHESTER

Computer Conservation Society

Aims and objectives

The Computer Conservation Society (CCS) is a co-operative venture between the British Computer Society, the Science Museum of London and the Museum of Science and Industry in Manchester.

The CCS was constituted in September 1989 as a Specialist Group of the British Computer Society (BCS). It is thus covered by the Royal Charter and charitable status of the BCS.

The aims of the CCS are to

- ◇ Promote the conservation of historic computers and to identify existing computers which may need to be archived in the future
- ◇ Develop awareness of the importance of historic computers
- ◇ Encourage research on historic computers and their impact on society

Membership is open to anyone interested in computer conservation and the history of computing.

The CCS is funded and supported by voluntary subscriptions from members, a grant from the BCS, fees from corporate membership, donations, and by the free use of Science Museum facilities. Some charges may be made for publications and attendance at seminars and conferences.

There are a number of active Working Parties on specific computer restorations and early computer technologies and software. Younger people are especially encouraged to take part in order to achieve skills transfer.

Resurrection

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Editorial

Nicholas Enticknap

This is an untypical issue of *Resurrection*, in that it has been spawned entirely by the fascinating seminar on Government support for the computer industry held by the Society at the Science Museum in January. One of the stars of the show, Peter Hall, felt that many key questions remained unanswered at the end of the day. Most particularly, why did Government support fail?

Peter has subsequently stimulated several key players of the time to set down their own views on this and other unanswered questions. They include his fellow former ICL executives Virgilio Pasquali and David Talbot, and, providing an external perspective, the former head of the Central Computing Agency (CCA, later CCTA when “Telecommunications” was added to the title) Reay Atkinson. This issue therefore is acting as an extension of the seminar and taking discussion of the issues raised there one step further.

An edited version of Peter Hall’s own talk at the seminar starts off the debate, and is followed by a personal statement by him of his view on the unanswered questions. Virgilio Pasquali then contributes a detailed description of ICL’s many attempts to secure collaborative agreements with European companies, based on his own involvement, and illustrating that any failure was most certainly not for want of trying.

Then David Talbot, who worked for the European Commission following his time at ICL, offers his views on why ICL’s collaborative ventures produced such poor returns. Finally Reay Atkinson addresses the key question of why Government support failed, laying the blame firmly at the door of Government ministers, senior civil servants and senior management within ICL.

An era ended for the Society at the AGM, when Hamish Carmichael stepped down as Secretary after nine years dedicated service. Chairman Roger Johnson paid glowing tribute to the smoothness with which the Society’s affairs have been administered during Hamish’s term of office, testifying with gratitude to the “armchair ride” he himself has been given. Hamish will continue to serve on the Committee in his capacity as Archivist, and we look forward to receiving the benefit of his wise counsel for many years yet.

News Round-Up

Hamish Carmichael's decision to stand down at the AGM as the Society's Secretary has created a yawning void which it is taking three people to fill. One of them is Hamish himself, who will continue in his post as Archivist to the Society.

101010101

Kevin Murrell, Chairman of the DEC Working Party, is the Society's new Secretary, while David Anderson has taken on the challenging role of London Meetings Secretary.

101010101

We regret to report the death of Robin Shirley, chairman of the Society's S-100 Bus Working Party. Robin had been a member of the Society's Committee since the beginning, and ensured that early days of the personal computer formed just as much a part of the Society's remit as the glamorous days of the first generation. He will be greatly missed.

101010101

Computer pioneer Andrew St Johnston died in April, aged 82. He led the team that developed the Elliott 401 which is now being conserved by the Society, and also played a part in the development of the subsequent Elliott 803. He was an active member of the Society, and donated the Elliott 803 which the Society now runs at Bletchley Park.

101010101

CCS member Alan Thomson has persuaded the Oxford University Press to make Martin Campbell-Kelly's authoritative history of ICL available through their Print-on-Demand facility. The price for a single copy is £60. Interested readers should contact Alan at alan.thomson@breathe.com.

101010101

"The Origins of Cyberspace", a library dealing with the history of IT, was auctioned at Christie's New York in February. The collection, built up by Jeremy Norman, included books, papers and documents relating to the first computers, as well as academic papers about computing theory. Christie's was only able to sell a little over half of the 250 lots, but managed to realise £595,000 (£309,400).

101010101

Society Activity

Small-Scale Experimental Machine

Chris Burton

After seven years located on the top floor of the 1830 Warehouse at the Museum of Science and Industry in Manchester, the SSEM was moved down a floor during April. This is to make way for a big Communications Gallery due to open in the autumn. The SSEM will form part of an enlarged Computing Gallery in about two years time.

The physical move went relatively smoothly, but the re-commissioning has taken longer than expected – all the faults were due to incorrect re-wiring, wires not connected at one end, or control settings mis-adjusted. We expect to resume the Tuesday demonstrations in early June. Regrettably, due to insurance and fire regulations, it will not be possible for the public to view the machine on other days, except by prior arrangement. This is a disappointing setback, as we know that many visitors, especially from overseas, include the SSEM on their itineraries.

Contact Chris Burton at c.p.b@envex.demon.co.uk.

Elliott 401 Working Party

Arthur Rowles

The Working Party has been diligently labouring at a rate of four five-hour working sessions a month at Blythe House over the past few months. This has produced significant progress, albeit of a stuttering nature. The powering-up sequence has continued to respond upon request, though with the occasional puzzling lapse. We now regularly have the drum motor running. Its speed, as checked by Strobflash, is somewhat higher than the specified 4500 rpm, but not concerningly so. We have yet to achieve regulation of drum speed through Foster-Seeley evaluation of clock-track signal rate, our immediate objective. We do believe we have seen signals from the clock track, these proving sensitive to axial movement of the drum-track sensing head.

We are learning about the physical disposition of motor-speed-control electronics, which differs from documentation to hand. With speed stabilised and a reliable clock available, we shall next determine a suitably limited area of the logic to get operational, repeatedly and

reliably. That will be a significant step forward. Then we shall tackle the rest of this historic machine. We do tell ourselves that the 401 did at one time give service for a decade or so!

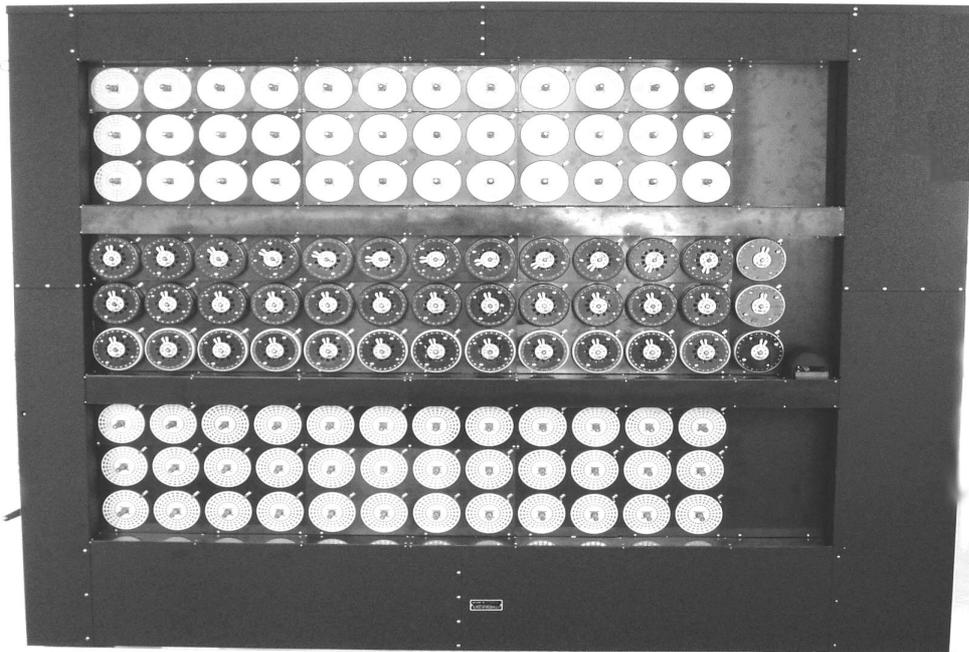
Contact Arthur Rowles at rowles01@globalnet.co.uk.

Bombe Rebuild Project

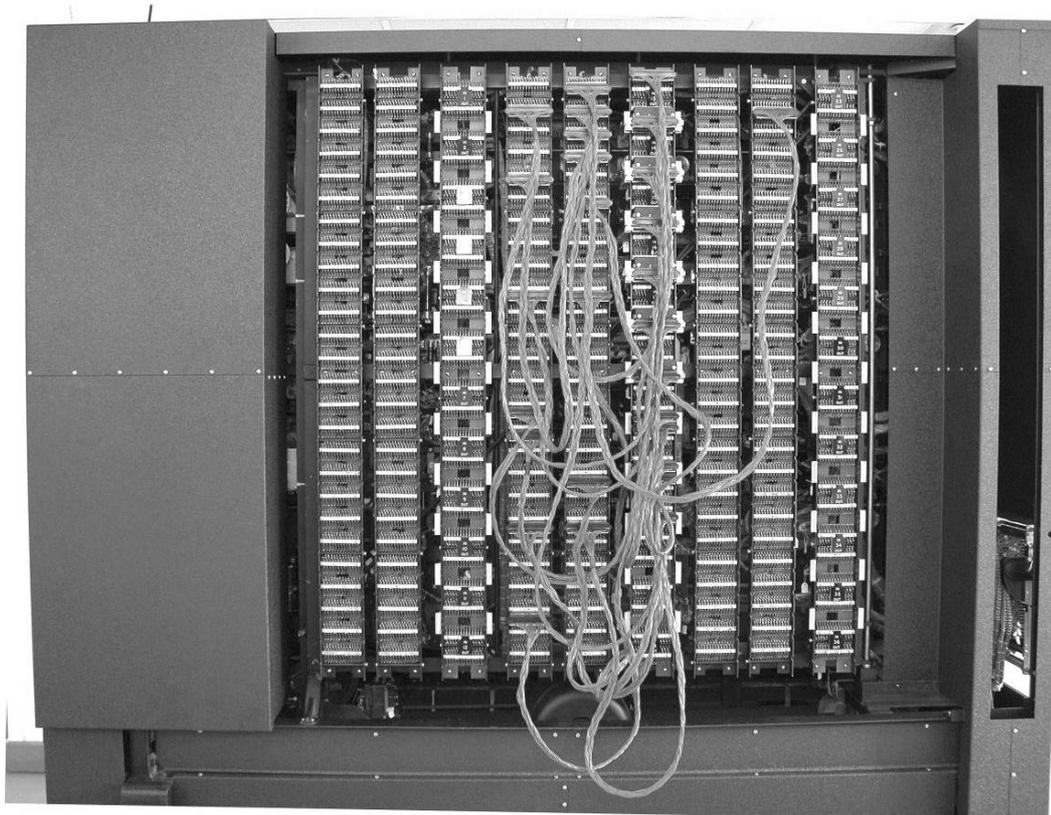
John Harper

Progress making Drums, Cross and Connect units and Relays continues at a good pace. However, this is being done away from Bletchley Park, so there is little changed on the machine itself since my last report.

Because of this we have chosen to keep the report short, but for the first time add photographs of the machine as it is today. The views are of a complete machine, which it is externally, though many more relays have still to be manufactured and fitted.



The front view (above) shows the machine with one bank of drums fitted. A second bank should be available in a few weeks time, with the rest becoming available in batches throughout this coming autumn and winter.



The rear view (above) shows a sample menu plugged up for one bank. We have more menu cables and cross and connect units complete, and again the full quantity will be made towards the end of this year.

Not having available a full set of these items will not however stop us testing one third of the machine, being a complete representation of one bank and menu. Therefore this autumn we hope to run genuine work albeit at only one third of the machine's full capability.

Our Web site can be accessed at www.jharper.demon.co.uk/bombe1.htm.

Our Computer Heritage

Simon Lavington

Many categories of information are now complete. The remainder divide into two groups. First, computers such as the Elliott 152 where it may prove impossible to find any further original documentation; second, computers for which the volunteer information-compiler has had to withdraw from the fray because of other commitments. For a look at the state of play, see www.ourcomputerheritage.org/wp.

Two new families of machines – Leo and English Electric – have been added to the corpus. The Leo Society has been co-operating in a commendably vigorous manner, but tends to deal more in anecdotes and applications rather than technical details of the machines themselves. The English Electric contingent, in contrast, has so far been regrettably reticent on all aspects. Is there anyone out there from English Electric who can help us?

We have begun discussions with potential funders about creating an attractive front-end for the Pilot Study and incorporating a picture gallery.

Contact Simon Lavington at lavis@essex.ac.uk.

Mil-Dap Working Party

Brian M Russell

The two Perqs are still at Chris Burton's place¹. We are stuck for boot floppies, either physical discs or files. If anyone knows of someone with a Type 1 (not Type 1a) or Type 2 Perq, please let me know. If and when we get the software off, we will dispose of the machines.

We now have five people interested in taking the two machines! I may have to hold an auction.

Contact Brian Russell at brian.russell@iclway.co.uk.

North West Group contact details

Chairman Tom Hinchliffe: Tel: 01663 765040.

Email: tom.h@dial.pipex.com

Secretary William Gunn Tel: 01663 764997.

Email: william.gunn@ntlworld.com

Science & Industry Museum representative Jenny Wetton, Museum of Science & Industry, Liverpool Road, Castlefield, Manchester M3 4JP.

Tel: 0161 832 2244. Email: j.wetton@msim.org.uk

¹ See report in issue 34, page 3.

How British Computer Industry Muddled Through

Peter Hall

The author describes how Government support for the IT industry operated from the recipient's point of view. He details the welter of different support systems given to first Ferranti, then ICT and finally ICL, highlighting the changes of policy that occurred every time either the responsible Government minister or the company's chief executive changed. The end result was a far smaller level of support than was received by equivalent companies in France and Germany, but a very similar outcome.

The Government support story begins in 1948 with Freddie Williams and Tom Kilburn at Manchester University. Freddie Williams was a good friend of Herbert Wood and Eric Grundy at Ferranti, just down the road in Moston. Freddie turned to those guys and said "Would you like to do something about this?".

This meant that Vincent de Ferranti had to be convinced, because he owned the Ferranti company, and anything we did had to come out of his pocket. He said "It sounds a marvellous idea and it meets my criteria that anything we do in the way of research and development must be good fun (he was always saying this) but I'm not going to pay for it".

We were lucky because about this time Professor Blackett learnt about the computer and thought that it was going to be important. He sent Sir Ben Lockspeiser up to the University, and he believed it might help in some of the computing for gun-laying that they were doing analogue-wise. Ferranti was also doing analogue computing for gun-laying, so it all fitted in.

Lockspeiser decided that we needed support, and he sent Ferranti a letter in October 1948, saying "Do what the University wants, and I'll send you any sums of money that are necessary. If you have any difficulty just write to me."

That was a very good beginning, and it should have gone on like that: we'll pay; any difficulty, we'll pay up again. Naturally it did get tidied up a bit: eventually we got a letter that gave us £35,000 a year for five years. In 1948 terms, that was a pretty good deal. There were no

strings attached. We didn't have to produce anything, or meet any specifications, or deliver anything. We just had to help the University.

From then on, Government policy went downhill. Ben Lockspeiser's freedom to break the rules came to an end when NRDC was set up. That was at the back end of 1948. NRDC was charged with the crucial task of exploiting the results of research in universities, and getting an income from the patents that arose. It was given the magnificent sum of £5 million, to be paid back at the end of five years.

That was difficult for the NRDC, and when we looked to them to support the development of the Mark 1 ★ computer there was a clash of cultures. They wanted all their money back, and Vincent said "I'm not going to spend one penny!". It was a difficult negotiation.

In the end Ferranti got a deal. NRDC was to pay for all the development work. Ferranti was to make four computers and NRDC would pay us 7½% on top of our costs as profit, and furthermore they'd give us 5% commission to help us sell the four machines. That was a very good deal, and it helped Ferranti very much in the emerging market.

The negotiations were long and tedious. When the next machine came along (what was to become Mercury), the negotiations went on and on, so Ferranti turned to DSIR². DSIR was interested, but as it turned out neither DSIR nor NRDC coughed up anything. Some wise guy said that it looked as though DSIR and NRDC were competing as to who should not support the development of computing!

So Mercury was developed entirely with Sir Vincent's money. I think by this time he was becoming a bit soft, or perhaps he wasn't paying enough attention. It turned out very well for him, though, as Mercury was a profitable and very successful computer for those days. Ferranti sold 18, which for a computer of that size was a considerable achievement. NRDC lost out.

There were other moves afoot in Ferranti. One was Pegasus, the package computer. It required finance, so a new deal was done with NRDC. It was similar to the Mark 1 arrangement, covering the production of 10 computers for cost-plus 7½%, up to a maximum of £200,000. There were a lot of difficult negotiations, but in the end Vincent got his way – he was a clever character.

But trouble lay ahead. Development costs soared, and the first nine computers were sold at way below cost. The contract had been written

² Department of Scientific and Industrial Research.

slackly by NRDC, and even though everything was going to overrun, they were committed to pay for all of it. They got nasty, and decided to launch legal action, which was not to Vincent's liking at all. People taking legal action against his company! And asking for their money back!! He thought he'd better compromise – he was ever a practical sort of guy.

This was just after I'd taken over the computer department. He said, "We'd better give some of the money back to make them sweet". Not all of it, of course; just enough. So I had the most marvellous experience. For the first time in my life I saw how negotiations of that sort were done.

I went to lunch at the Savoy. I'd never been there before. There I was with Sir Vincent de Ferranti and Sir William Black, Chairman of the NRDC, when they did a gentlemanly negotiation. It was quite different from all the rough and tumble of dealing down the line with NRDC. They agreed that £75,000 would be given back.

Things were moving on apace. It was a highly competitive, rapidly growing business, and technology seemed to be changing every day. In that climate I was faced with what seemed like another over-the-top proposal from our friends in the University. Tom Kilburn came along with a proposal for a machine that would be way ahead of anything and certainly seemed to me to stretch credibility. This was to become Atlas, or what some of us called Bison – "Built In Spite Of NRDC".

It was about this time that we really began to feel the impact of the size and power of the American companies. Their large home market gave them an enormous advantage, which was largely protected by the Buy American Act. Just as important was the aid given to them by their government. IBM, for instance, received about \$500 million in the 1950s for the development of Sage, nearly 60% of IBM's development budget.

It was vital, therefore, that we got support for Atlas. IBM's Stretch and Univac's Larc were well on their way. We were encouraged by the interest of the Atomic Energy Authority. There was clearly a possibility of finance from them – like the American government orders, placed before the machine was developed. But negotiation dragged on, and got nowhere, and the burden reverted to NRDC.

EMI had also put a proposal for a very large machine to Government, and NRDC had to be fair to everybody. They gave us £300,000 and EMI £250,000. When you think of the development cost of Atlas, it was not a very large sum of money. Sir Vincent must have mellowed, or else he had a very unjustified confidence in my judgment,

because he allowed me to get on with the development of Atlas long before the deal was done. In fact, I never asked him; I just got on with it, and I had to explain an awful lot of red ink. The NRDC's £300,000 was a help, but most of the money for the development of Atlas came out of Sir Vincent's own pocket.

Clearly we needed a customer who had a deep pocket and was sympathetic. We had good friends in the Atomic Energy Authority and we knew they needed a machine. Jack Howlett at Harwell had been a loyal Mercury customer and understood the potential in Atlas. He became our first customer. Between us we convinced the contracts people that it would be worth £3.5 million, which covered quite a fair proportion of our development costs. What a relief! We received an order from the Atomic Energy Authority which just specified it was to be "delivered to the satisfaction of Dr Howlett".

That was another fairly good bit of government policy, we thought. I was so thankful to get that letter. It's just a short letter – two paragraphs – and I have it framed and hanging up at home. Jack was a very tough customer, but fair, and it was marvellous to work with him, and I think Atlas did sterling work for many years.

One order was not enough. We decided we'd have a go at selling Atlas in America, because there was nothing like it there. So I decided to go and speak to the President of the Board of Trade: there was no point with mucking about with civil servants. That was Reggie Maudling. We had a long meeting with him. When the meeting ended Reggie said to me he could not understand why anybody would want to do so many sums. Needless to say we got no help.

We wasted a lot of money having a lovely trip around the States. We created a lot of interest before realising that even if the machine had been fully demonstrable (which they didn't ask of any American supplier), we had no hope of a sale, because of the Buy American Act. Even though the Act ostensibly applied only to defence contracts, any company that had any dealings with the Government felt safer playing by its rules.

Boeing, in fact, was very keen. We had some good friends there, who were keen to buy a machine. But when it came to it, the top brass would not countenance it because of the defence side of their business. The American Prudential Insurance company was also keen, but the top brass would not have it there either.

About this time I realised that there was no future for Ferranti on its own, and we sold the business to ICT. I had great deal of difficulty in

persuading Ferranti to do this, but in the end it had no option, the losses being unsustainable.

Working for a public company was very different from working for Ferranti. There I was the principal interface to Government. But in the early days of ICT there were many others involved. So from now on I rely an awful lot on what Campbell-Kelly has to say³.

Around this time also the French and the Germans wanted to get in on the act of having a computer industry. In France the Government set up *Plan Calcul*. They were triggered when the American government would not allow the sale of a CDC 6600 to the French Atomic Energy Authority. Eventually *Plan Calcul* led to the formation of CII (*Compagnie Internationale pour l'Informatique*).

In October 1964 Harold Wilson came to power. We wondered what the policies would now be, particularly after his “white heat of the scientific revolution” speech. That all sounded good. Years later when he was out of office Harold used to tell the story – I’ve heard him do it – that he set up MinTech with Frank Cousins as the boss and told him: “Frank, you’ve got one month to save the British computer industry”.

Frank said the obvious thing to do was to merge English Electric and ICT. Both companies said no. When this was understood by the Ministry, it set about the far more sensible business of finding ways of stimulating and diffusing computer technology.

Four initiatives were announced. First came the Computer Advisory Unit to stimulate the use of computers in the public sector. Second, the Flowers Committee was set up to report on the need of computers in the higher education sector. Third was sponsorship of R&D, by expanding NRDC and also by setting up the Advanced Computer Technology Project. NRDC promptly granted a loan of £5 million to ICT, and ICT also benefited under the ACTP arrangements which were on a costs-shared basis. Support of the Basic Language Machine was important. Fourth, Frank Cousins set up the National Computing Centre – the NCC – which still exists, and has done a good job; I was to serve on its council for many years. All these initiatives were worthwhile, but were unable to halt the steady relative decline of the UK industry.

There was a further unannounced initiative by Frank Cousins. ICT was invited to lead a European consortium to build a new giant machine. We worked up a proposal with the French, and in July 1965 we went to the Government with a price tag of £10 million (which was nowhere near

³ *ICL: A Business and Technical History*, by Martin Campbell-Kelly.

enough, but that's what we said) to be wholly met by the Government. The Government turned it down; with hindsight, probably wisely. But there was some helpful fallout from this consideration, as they decided to implement fully the Flowers Committee report.

Then it was all change again, when Anthony Wedgwood Benn replaced Frank Cousins. At this time ICT was beginning to run into a leasing finance crisis, and needed the government to underwrite a loan guarantee. ICT also needed support for the largest of the 1900 machines, the 1908. In April Wedgwood Benn called a meeting of ICT and English Electric, and said the Government would agree to ICT's loan guarantee and to the support of a top-range machine if the two companies would merge. If they didn't, he'd wash his hands of the computer industry altogether. So negotiations began, but that's another story altogether.

Did the government get value for money? In the event the Government ended up with 10% of ICL shares, having put in £13.5 million. Campbell-Kelly says, "... perhaps the most striking feature of the computer merger was the very small amount of money the Government put in in relation to the degree of rationalisation it achieved. In fact, although the Treasury may have rubbed its hands over its financial prudence, its mean-mindedness meant that ICL was financially hobbled from the day it began operations." He said it, not me, but I think he sums it up well.

Stan Gill said in 1973 that Benn did have the opportunity to undo the damage that the Government had been doing since the industry began, but the industry was very little better than it would have been had he left it alone.

The largest single customer for computers was, and I suppose still is, the Government. How the Government purchases, and the preference it gives to a national supplier, is obviously a major factor in that supplier's fortunes. I mentioned earlier the American situation and the Buy American Act. The Germans and particularly the French were very up front about it. It was virtually impossible for ICL to sell to the state sector in those countries.

In the UK things were different; we had to play cricket. It was not until the Select Committee on Science and Technology set up a sub-committee to examine the prospects for the UK computer industry, including among other things the functions of government in this field, both as a policy-maker and user, that the policy became public.

In summary it was that for computers larger than Atlas Government would purchase by single-tender action from ICL, provided that ICL was competitive in price, performance, and delivery. I used to say that if ICL was competitive in all those ways we would have got the order anyway; what we needed was the orders when we were not competitive one way or another, and that was bound to be most of the time.

It was a strange policy, but in fact it worked well for ICL and some – including me – would say that it was vital for the company’s survival. It worked because civil servants did their best, with ICL’s help, to prove to themselves that the ICL bid was competitive. That’s what we had to do, and I’m sure that that was what the politicians wanted, even if they couldn’t actually say so. I believe that the policy worked well for the Government as well as the company. ICL put in exceptional efforts to ensure that the Government got what it ordered on time and to specification, and generally it did: and, of course, at a fixed price.

On one memorable occasion, when I was somewhat nervous about making a commitment, I remember taking Arthur Humphreys along to see the Minister concerned, and the Minister looked Arthur straight in the eye and said: “Mr Humphreys, if you have this order, will you deliver it on time, and will it work?”. And Arthur looked him straight back in the eye and said: “Yes, Minister”. I was absolutely horrified. But you can imagine how we pulled all the stops out, and it did. And you can also imagine just how much it cost us – an awful lot of money.

In June 1970 it was all change again. Ted Heath became Prime Minister, and Mintech was replaced by the Department of Trade and Industry. The Select Committee was allowed to continue its work, albeit with different members, and it was not until November 1971 that it reported. Their report was critical of the Government’s role in the industry, and, I quote, “We found it difficult to describe the present Government’s action regarding computer research and development as a policy.” It also recommended that at least 10 times current expenditure on R&D, or a minimum of £50 million per annum, was required without delay. This was conveniently interpreted as “£50 million to ICL”, though that was not what they meant.

The next month ICL made a submission, asking the government to underwrite £35 million for the development of the New Range. I had sounded one or two people out and it seemed to me that £35 million would not be a figure that would be unacceptable in Government circles.

We also got changes in our bosses, and we had a new Chairman, Tom Hudson. He said: “£35 million? That’s rubbish!” He told the

Government that it wasn't £35 million ICL needed: it was £107 million. Panic all round! The reaction was "Go away and find a foreign partner", which was as good as saying "Go away and sell yourself".

Within a month or two a new Managing Director arrived, Geoff Cross. All change again. "Sorry about £107 million. It's £50 million." The Government must have wondered what we were up to, but nevertheless in July the DTI agreed to £14 million for the following year, with indications that the rest was to be negotiated. In the end a total of about £40 million was agreed.

The interesting thing about that was that the money was to be repaid over seven years on the basis of 25% of the profits in excess of 7.5% of turnover. This was a good deal for ICL, because 7.5% of turnover would be more than adequate, and profit could easily be held down to that figure. That objective was achieved without effort, so nothing was paid back. It must have been the case that the Government never expected any payback, but it had to dress up the deal to satisfy critical politicians.

It's perhaps just worth looking at the R&D support given by French and German governments to their industries. In France from 1966 to 1975 there was £139 million. In Germany from 1967 to 1975 there was £365 million. In the UK, with £18 million to ICL and £13 million to the rest, the total was only £31 million. Even allowing for different time periods, the overall order of magnitude of the figures shows that we were hard done by in the UK. But who was the most successful? In all three countries an indigenous industry was established, but it's far from obvious that France and Germany were any more successful than we were in the UK. As usual, somehow we muddled through.

At the end of the period, IBM had roughly the same market share as they did at the beginning, and of course today there's no significant European hardware industry left. Nothing could compete with the American suppliers, with their massive home market, and their imaginative government policies.

Author's note: The author's memory and papers were verified by reference to John Wilson's Ferranti – A History, and Martin Campbell-Kelly's ICL: A Business and Technical History. Both provided additional information.

Editor's note: This article is based on the talk given by the author to the CCS on "The background to Government support" at the Science Museum on 20 January 2005. The Editor acknowledges with gratitude the work of Hamish Carmichael in creating a transcript of the talk.

Why Did the European Computer Industry Fail?

Peter Hall

There were some challenging questions posed at the end of the CCS seminar on Government policy and the Computer Industry on 20 January 2005. Not all were given a satisfactory answer.

In particular, why did the European computer industry fail when in similar circumstances the aircraft industry succeeded? In both cases the Europeans faced competition from dominant American competitors, IBM and Boeing respectively. On the face of it, if Europeans could get together, form Airbus, and grow it from small beginnings into a major player in the world market, then why did efforts to set up the European computer industry fail? Indeed, did anyone try?

There are many parts to the answer. Here I deal only with what I believe is the underlying problem, to which there was not a solution. I for one cannot see how a solution could have been found.

The two industries faced very different environments. To create Airbus required massive financial support from Governments. Such support is only possible when politicians believe it will be understood by and popular with taxpayers.

Aeroplanes and the aircraft industry were very much in the public consciousness. The Spitfire had won the Battle of Britain. People wanted the aircraft industry to succeed, and politicians got kudos for glamorous projects like Concorde even if they were commercially suspect.

In contrast, the public was quite ignorant of the infant computer industry. Politicians were uninterested; senior civil servants had much more important things to worry about. In a climate in which a quite eminent scientist could state that a computer in each of Manchester, London and Edinburgh should be enough, it was difficult to convince the powers that be of the likely future importance of the computer industry.

As a result, significant financial support was not available in the early crucial days in any European country. By the time it became obvious what was needed, it was too late.

ICL had no other businesses to support its computer activities (unlike for example Siemens) and so had to ensure a profit from computers each year. In an essentially rental business with advancing technologies making for early returns, this was not an easy task. It must

be admitted therefore that perhaps insufficient top management attention was paid to forming alliances in Europe in the early days. The concentration was on building up the significant, but small in percentage of market terms, unprofitable European businesses. Sadly those who could contribute the greatest insight to this part of the argument are no longer with us, particularly Arthur Humphreys.

Three men who can provide details of the background are Virgilio Pasquali, David Talbot and Reay Atkinson, and their views follow. Virgilio has written of the details of ICL's efforts to forge European alliances; David Talbot gives the views of one who served in the European Commission after a distinguished career in ICL and ICT; and Reay provides the perspective of a senior British civil servant.

CCS Web Site Information

The Society has its own Web site, located at www.bcs.org.uk/sg/ccs. It contains electronic copies of all past issues of *Resurrection*, in both HTML and PDF formats, which can be downloaded for printing. We also have an FTP site at [ftp.cs.man.ac.uk/pub/CCS-Archive](ftp://ftp.cs.man.ac.uk/pub/CCS-Archive), where there is other material for downloading including simulators for historic machines. Please note that this latter URL is case-sensitive.

ICL and Europe

Virgilio Pasquali

ICT and later ICL made many attempts to forge links with other computer companies in Europe, the US and Japan in order to position itself to compete more effectively with IBM. The author describes a large number of initiatives with European companies he himself was involved in from ICL's formation in 1968 to the end of the 1980s.

When ICT launched its first compatible range, the 1900, in 1964, it was the top computer manufacturer in the UK: its customer base was greater than IBM's, the dominant world supplier. But ICT had only about 2% of the world market.

The merger of ICT and English Electric that formed ICL in 1968 did not correct this imbalance. Therefore, to maintain credibility and market share in the UK, ICL had to match IBM 360 systems with competitive systems across the whole range, though its total revenue was smaller than IBM's R&D spend.

This position naturally drove ICL towards collaborative ventures, to achieve both more effective expenditure in R&D and greater market penetration of in-house or joint products, especially in Europe.

Unfortunately, while mainframes dominated the market, lack of compatibility between manufacturers made shared developments in processors and software extremely difficult, as the moving of customers' applications from one computer range to another incompatible computer range was very complex (and risked loss of the customer to the competition).

ICL was eventually forced to solve the problem of bridging from one range to another when, as a consequence of the merger, it had to converge the 1900 and System 4 ranges into the New Range at the cost of great development expenditure on system environments such as DME and CME★.

Here is a description of the initiatives mounted by ICL to develop partnerships and alliances in Europe. I have listed other events as necessary to give a context.

Early 1960s: ECMA

ICL's efforts over the years to get something going in Europe started in the early sixties with the setting up of the European Computer Manufacturers Association (ECMA), in which the driving force was Cyril Holland Martin, a Director of ICT. ECMA was mainly concerned with standards; later on John Pinkerton played a major part in their councils. A strong drive to establish partnerships and alliances however only took place after the ICL New Range had been defined.

1969: ICL New Range planning

Phase 1 (January to May 1969) resulted in the choice of the "Synthetic Option" in May 1969. The architecture of the Synthetic Option owed much to the MU5 design, following a long tradition of collaboration with Manchester University. The Synthetic Option team, which I led, comprised John Bowthorpe, John Buckle, Jack Connet, David Howarth and Colin Taylor. We integrated the essence of MU5 with key features from the in-house Basic Language research system, to improve its commercial data handling capabilities.

Phase 2 (up to October 1969) saw the introduction of a stronger protection mechanism.

At this stage, ICL had architecture for a state of the art New Range, and a very large and expensive development task ahead. Towards the end of 1969, ICL started to look for partners willing to share the development and marketing of the New Range.

1969-71: Talks with CDC and CII

ICL discussed with CDC and CII a Joint Processors Range (see next item) and an agreement on peripherals, involving i) a licence to manufacture peripherals such as OCR equipment; and ii) acting as sales outlets for each others' equipment. This led to the formation of Multinational Data (owned by the three companies) in November 1970, with Dennis Blackwell as MD.

1970-71: Joint ICL/CII Processors Range

John Buckle remembers: "Although genuine attempts were made to achieve major co-operative projects, technical strategy and marketing goals seriously limited what was possible".

The CII technical team comprised Francois Sallé, J Renault, R Briand and C Buisson. The ICL technical team comprised myself, John Buckle, Mahandra Patel, Chris Burton, David Eglin and Brian Procter.

CII required data compatibility with IBM in its future systems, so, to allow talks to proceed, ICL changed the data formats of its New Range.

Eventually a joint technical study team which met on 15 to 25 July 1971 agreed the technical outline of a Joint Processors Range (PI). The Report documenting the agreement was signed by Francois Sallé and me⁴. However, after the approval of a further tranche of *Plan Calcul* funding, CII withdrew from the agreement.

April-May 1972: Talks with Telefunken

Alan Bagshaw and I led the ICL team. Initial contacts were very promising: Chris Burton observed in February 2005 “I recall being impressed by their peripheral interfacing”. Geoff Cross suspended these talks when he arrived as CEO in May 1972: he wanted to understand the company he had just joined before launching into collaborative ventures. The talks were never resumed.

In the six years with Geoff Cross at the helm, ICL concentrated on the development of New Range (now the 2900 series) out of its own resources. During this period, in 1976, the company acquired the International Division of Singer Business Machines, which gave ICL an increased presence in many European countries and took it for the first time out of mainframes and into minicomputers.

1975-86: Talks with Nixdorf

Broader talks were initiated with Nixdorf (through Heinz Nixdorf himself) and Olivetti while seeking a supplier for our terminals. We were interested in banking workstations from Nixdorf and office workstations from Olivetti. The first visits to discuss products, by Alan Bagshaw and me, were I believe in 1975.

Talks and friendly interaction with Nixdorf continued for many years. Mike Forrest remembers: “I participated in this to the extent of a visit to Paderborn and a dinner at the Royal Garden (or was it the Royal Lancaster?) hotel. Herr Nixdorf seemed very keen to keep the talks going and conclude them successfully. The unexpected and untimely death of Heinz Nixdorf in 1986 largely brought the possible cooperation to an end”.

1979-80: Enhanced 2900 planning

On 31 January 1979, IBM announced the 4300 range, replacing the 370 range with advanced computers with a three to fourfold price reduction. ICL decided to develop the 2900 SxL series (where L stands

⁴ CII-ICL Technical Working Party PI Range Study Report.

for Large Scale Integrated circuits, LSI), using, in the top models (S3L and S4L) the West Gorton-developed high-speed ECL LSI technology. But ICL needed a cheaper technology for S1L and S2L.

1980: Talks with Hitachi and Fujitsu

In the search for an IC technology partner for the S1L-S2L range, Colin Haley and I visited Hitachi and Fujitsu in November 1980. I remember that we asked each of them to develop the S1L processor for ICL, but both companies were tied to IBM-compatible ranges and did not have spare development resources in that area. During the visit to Fujitsu Messrs Naruto and Hiraguri showed us their new and very advanced LSI technology, the Cube.

1981: Talks with Potential Partners

ICL ran into a financial crisis in early 1981. It needed an injection of capital of around £50 million from a partner, in exchange for part ownership of ICL. Multiple parallel discussions took place with potential partners including Fujitsu, Burroughs, NCR, Univac, CDC and I believe Hitachi and one or two others. Univac decided on a full acquisition of ICL. But a Government loan guarantee to the banks organized by Reay Atkinson allowed credit to ICL to be re-established and stopped the acquisition. As part of the rescue agreement, Robb Wilmot arrived as CEO of ICL in May 1981.

1981: Fujitsu technology agreement

Robb Wilmot cancelled the in-house LSI development (“Even if we become competitive, we will only be competitive for a microsecond”). ICL started DM1 and Estriel (the old S1L and S3L) developments based on Fujitsu LSI technologies, on the back of an ICL-Fujitsu technology agreement negotiated by Robb Wilmot and David Dace in mid 1981. This agreement gave ICL access to LSI and packaging technologies that, when combined with ICL’s sophisticated CAD capability, enabled ICL to design and manufacture advanced and very profitable mainframe systems.

There now emerged a new ICL corporate strategy. The injection of Fujitsu LSI technology made ICL mainframes very competitive and profitable, enabling the company to focus more on the emerging markets for small systems. The very profitable mainframes were to be used as “cash cows” to fund extensive development in small and distributed systems.

1981: Collaboration with Universities

From 1981 ICL was much more outward looking. Wilmot disbanded the ICL Research Department (researchers were redeployed into small systems development) and initiated URC (ICL University Research Council) with Peter Hall as Chairman (I was its secretary), to forge stronger links with UK universities, to influence and advise their research, and to fund selected projects. That was in 1982.

URC produced the additional benefit of enabling ICL to play a leading part in the UK Alvey programme when it started in 1984, as strong links with UK universities (previously channelled via the ICL Research Department) had been established with many R&D teams across the company, enabling many collaborative projects to further develop and transfer technology from UK universities.

1983-84: Pan-European Collaboration

In 1983 the European IT Industry Round Table was formed, with Robb Wilmot as one of the prime movers. It comprised senior executives – at CEO level – from Bull, Thompson, Alcatel, ICL, GEC, Plessey, Siemens, Nixdorf, AEG, Phillips, Olivetti and Stet. This Group of 12 formed the IT Industry Steering Committee (with Colin Haley and I representing ICL), which met regularly and interfaced with the European Commission. The Esprit programme was launched by the European Commission, with a pilot phase in 1983. It started fully in 1984.

1983-91: Bull/ICL/Siemens Collaboration

In 1983 the BIS meetings between Bull, ICL and Siemens started at CEO and senior level. This successful collaboration continued with ICL involvement until 1991, with top executives meeting at regular intervals.

In 1984 one of the outcomes of BIS was ECRC (European Computer Industry Research Centre, a joint venture based in Munich), formed to research new software technologies. The Managing Director was Hervé Gallaire. I recall that Siemens chose the location, Bull chose the managing director, and ICL chose the working language of the Institute. ECRC was staffed in part with technical people from each of the three companies.

1984-1991 European Cooperative Ventures

ICL's presence in the IT Industry Steering Committee produced a considerable number of joint projects in Esprit and Race. They included the European Declarative System (EDS, which eventually produced Goldrush in ICL) and other Large Scale Computing projects, and projects

in Advanced Design Automation, Software Engineering, Advanced Office Applications, Computer Security and Standards.

These programmes injected many advanced technologies and state of the art standards into ICL. Additionally ICL design and technology teams forged strong links with their peers across Europe, and established a high profile and active presence in the European IT community. ICL became widely respected across the European IT community for its technical competence and ability to work with other companies.

In the later years, ICL launched a number of companies to exploit the advanced technologies becoming available. They included CADCentre, INS (exploiting EDI know how) and AMT (Active Memory Technology, exploiting the DAP technology).

1989-91: European Acquisitions

Towards the end of this period, ICL was acquiring European companies.

- In 1989, ICL completed the acquisition of Regnecentralen of Denmark, which had made a name in front end communications handling computers.

- In 1991, ICL acquired Nokia Data, the computer division of Nokia. This acquisition was in many ways the largest European adventure of all. Nokia Data brought ICL a presence in the PC business and also strength in the Scandinavian countries. The latter has survived in the shape of Invea. An account of the ICL-Nokia cooperation by Mike Forrest is appended at the end of this article.

- Also in this timeframe the acquisition of Aquarius hugely increased ICL's strength in the PC business in Germany.

Ninian Eadie remembers: "While the large mergers eluded us, we were more successful in building up the countries through smaller acquisitions. Aquarius, Nokia Data and Technology plc were all aimed at building critical mass in the PC industry. But in the end the more successful strategy was moving the countries away from hardware and into software and services. There were a number of small acquisitions of software companies, and the large acquisition of the third party maintenance company Sorbus."

1984-90: X/Open

BIS agreed in 1984 to create common standards and a Common Application Environment (CAE) in Unix-based systems, to enable joint production of systems and common software. The initiative, initially

known as BIS, became Bison when other companies joined it (an acronym from Bull, ICL, Siemens, Olivetti and Nixdorf). Later Phillips joined and the name had to be changed (and anyway Bison was not a good name as those animals had become nearly extinct!). The initiative was renamed X/Open. It grew rapidly.

X/Open was formalised as a separate company on 10 September 1987, with each of the X/Open Group members becoming a shareholder. David Dace remembers: “I was chairing the meeting to form the company. Eleven companies from three continents were in the room. Each company had its own lawyer. The discussions went on for a long time, and, at about midnight, I remarked to the meeting that the champagne must be getting warm by now. The meeting was concluded successfully shortly after.”

By 1990 X/Open shareholders membership had grown to 21 companies, representing most of the world major IT companies.

1989: ICL-Olivetti Collaboration

Emerging common standards in Office Systems made possible the discussions of joint software developments. In 1989 a joint software company, initially between ICL and Olivetti, was discussed, and was on the point of being formally agreed and launched. However, ICL had to abort the agreement because of strong internal opposition by one of its Business Units.

1988-89: ENS Proposal

In 1988, ICL presented a proposal for ENS (European Nervous System), with BIS support, to the Round Table and to the European Commission. Peter Bonfield, the ICL CEO and Round Table member, was personally involved in the initiative.

ENS proposed an integrated set of infrastructure projects, based on Europe-wide “distance independent” and geographically distributed applications, implemented on the emerging high-speed telecommunication network and based on common IT standards.

Initial infrastructure applications included Air Traffic Management Open System (Atmos), Electronic Data Interchange (EDI), Freight Traffic Management, Public Security, Customs, Finance, Management of the Environment, Health Care, Education and Labour and Social Security.

The Round Table strongly supported ENS, as it enabled collaborations of both computer and telecommunications companies in a key emerging area of the market.

The Round Table companies produced a detailed proposal for ENS in 1989. A brief reference to ENS was written into the Maastricht Treaty in the same year, to obtain political approval and some initial financial support. Unfortunately, approval of the Maastricht treaty was delayed, and the projects could not be started until 1992. By then, ICL, having become fully owned by Fujitsu in 1990, was no longer a member of the Round Table or its Steering Committee, and the WWW aspect of the Internet (made possible by the standards which Tim Berners-Lee had invented while at Cern), was undergoing explosive growth, especially in the US.

I retired in 1992, and have no direct knowledge of events after then.

Author's note: John Buckle, Chris Burton, David Dace, Ninian Eadie, Mike Forrest, Peter Hall and David Talbot contributed to and validated the information in this article.

Mike Forrest adds:

ICL's presence in continental Europe had been small, decreasing in proportion to the market and generally unprofitable from at least the mid-1970s. It was therefore always in search of some form of salvation, either by cooperation or acquisition (it was not yet ready to consider divestment).

One of the potential partners was Ericsson which had among other things been a co-ownership partner in ICL Sweden. But by the mid-1980s this link was broken. In the meantime Ericsson had acquired the computer (mainly dumb terminal) business of Saab, known as Datasaab (which ICL had also considered acquiring). But by the second half of the 1980s Ericsson had decided that Ericsson Information Systems was not a core business and was a drain on profitability.

Nokia in the mid 1980s was on an aggressive shopping spree in the high technology area which led to its acquisition of Ericsson Information Systems, which it put together with a similar sized (but differently oriented in product terms) existing nascent computer business of its own. The sizes of these two units were similar, about 4000 employees each. The similarity also extended to a lack of profitability.

After one failed (but friendly) round of discussions with ICL about some means to relieve Nokia of this burden in about 1987, the personal contacts made allowed a restarting of these negotiations in 1990. At this

point the pressures on Nokia to divest and the advent of the financial backing of Fujitsu for ICL resulted in rapid progress to “due diligence” and an outline agreement for ICL to purchase. By May 1991 a six-month co-habitation had been agreed with finalisation in autumn 1991. Working level visits and studies commenced and ICL put together a team to progress the matter and plan for the absorption.

The overall management of this project (involving a purchase price of about £250 million) was the responsibility of Ninian Eadie, President of ICL Europe. His team was led by Tony Hadaway and included others of his HQ staff team including myself covering Internal Systems. By August it was agreed that ICL would take over operation of the Nokia units, and the purchase was completed in September 1991.

The actual size of the operation brought to ICL was some 9500 employees, of whom about 3500 were in each of Finland and Sweden and all but about 250 of the rest were in other western European countries. The attractions for ICL were a more substantial entry to business in PCs (most of Nokia’s development and manufacturing activity in computers being there), and sales forces in the larger European countries with several blue chip customers such as major Swedish government departments, French Railways and the German Post Office.

All this was headquartered in Kista, a Swedish high tech suburb of Stockholm, and headed by an Italian. Development was partly in Sweden (deriving from the Ericsson connection) and partly in Finland. Manufacturing was mostly in the latter at Kilo near Helsinki except for the residue of Datasaab in the form of a dumb terminal factory in southern Sweden (which seemed to operate mainly as an extension of the Swedish Government’s social security initiative).

Tony Hadaway moved back to his normal role in ICL Europe in 1992 having done the difficult, creative part of the acquisition and I took over to tidy up as the Integration Director for Ninian Eadie.

The overall effect of this was to increase massively ICL’s presence in Continental Europe (from about 2500 to 10,000 employees) but to make no serious impact on profitability there. On the other hand it did help to drag ICL into the PC business environment. It probably also reduced ICL’s insularity.

Why Collaboration Rarely Succeeded

David Talbot

The author analyses why the many collaborative ventures described in the previous article produced such little positive result. He concludes that the dynamic of the computer industry militated strongly against, and points out that even today most IT industry sectors still consist of one giant and many dwarfs.

Virgilio Pasquali's article on collaborations is one that identifies an important list of details on the subject and with the exception of one small question (which I set out at the end) they are ones with which I agree. I wish, however, to offer a few observations of my own regarding the nature of collaborations and in particular the attitudes that underpin or undermine them. I attempt to do this in the only real context that I know, that of ICL/ICT and my later experience with the European Commission and its successive Framework Programmes, the first of which was Esprit.

Virgilio makes the powerful point about the lack of "competitive balance" in what was then the "computer industry". IBM, even in the 1960s, was well on the way to becoming the single computer superpower, helped handsomely by the success of its 1401 and with the so-called seven dwarfs lagging far behind in terms of scale and resources.

ICL as one of the dwarfs was especially vulnerable since it was pitifully undercapitalised and essentially had to run a global business on the strength of a bank overdraft. For ICL this was a state that continued up to its end and provoked a series of "crises" (not just the one Virgilio specifically mentions) with associated changes of MD. Finding ways to leverage its very limited R&D resource was a business and strategic necessity. Collaborative ventures were an obvious route to follow but, as indicated by Virgilio, few succeeded. Why?

Collaboration between competitors is a subject now well covered by business schools. ICL has some claim to fame in stimulating this study, especially following the entry of Robb Wilmot as MD in the crisis period of the early eighties and its subsequent relationship with Fujitsu. This short note will add nothing original to the already substantial body of

existing work but, I am moved to record briefly some specific views of my own before they fade entirely from my memory.

The conditions for establishing a well founded collaborative enterprise are well known but a few of these are worth repeating – strong shared objectives, all parties with something valuable to offer, readiness to compromise and share possible competitive advantage, trust (usually built over an extended period of time).... Generally these do not sit well with the imperatives demanded in a highly competitive, fast moving market place.

They certainly did not sit well with the competitive, individualistic, sales-driven and independent-minded attitudes that were the essential attributes of the levels of management in ICL equipped and empowered to establish such ventures. These characteristics underpinned ICL's extraordinary resilience but also ensured that those charged at a staff level to pursue possible collaborative ventures had a real up-hill struggle.

Moreover, aside from the Advanced Research Group headed by Gordon Scarrott and its first class work on parallelism which was, by and large, poorly exploited, only the mainframe divisions in West Gorton and Kidsgrove could be said to be real originators. This in the sense of offering something technologically valuable (here they had a long and distinguished record) as a basis for collaboration involving shared development work demonstrated, for example, by the significant set of collaborative projects won in Esprit and mentioned by Virgilio. Aside from this capability the other major (possibly the major) trumps in ICL's hand were its sales force and its extraordinarily loyal customer base.

Of the few collaborative projects that could be regarded as strategic, only the X/Open initiative can in my view be regarded as a success. Its open systems aims resonated well with customers, it helped simplify aspects of development (although getting developers on board turned out to be non trivial!) and it hurt IBM (since it went, as I recollect, beyond just the Unix based systems mentioned by Virgilio, and hurting IBM was one of the original key objectives). Arguably, however, it was too little too late.

On the other hand ECRC was essentially a political statement, made affordable and doable by nature of its timing and context (the popular focus at that time on the Japanese 5G programme and Icot). Siemens, which tended to regard collaborative projects with anyone not galactic as secondary and certainly not strategic, viewed ECRC in this light and by ensuring its small size and work programme tried hard to see that it remained so. Bull, although a little more open minded, nevertheless, also

tended to lean in this direction. ICL cared more, did more and in the end gained the most when it eventually took it over and sold it for a profit to Cable and Wireless! (I am told that at the time of the sale it made the positive difference between making a profit or loss for that year!)

The initial relationship with Fujitsu was often claimed to be collaborative. In many ways this could be said to be true in the sense that it went beyond the normal customer (ICL)/supplier (Fujitsu) arrangements, with Fujitsu's initial reluctance to supply being worn down by Robb Wilmot's persistence and with further warmth being generated by their increasing respect for ICL's engineering qualities. All of this led to ICL being able to deploy first class technology in a rejuvenated mainframe range which continued to provide the essential component of whatever profitability the company managed to scrape together in any one year. Whatever, the end of the story is clear and for many of us, sad, but no doubt the basis for many business school case studies.

The structure of what was once called the computer industry, although now much more segmented and multi-faceted, continues to be one populated by giants and dwarfs with one giant and many dwarfs in each segment: in Virgilio's word, "unbalanced". The old problem for the dwarfs of how to leverage their R&D and marketing resource remains a constant source of interest and concern. Collaborative ventures remain a potentially attractive course of action and, as always, individual management and corporate attitudes will continue to be the most significant determinant of their success or failure.

The question I referred to in the first paragraph concerns the claim that ICL/ICT was the top UK computer manufacturer in 1964. How was this measured? If it is based on the numbers or values of real computers installed I would be a little surprised, since IBM had as I recollect a brilliant run with the 1401 and had established it as the workhorse of commercial computing. (It was a run of success that even took IBM by surprise, and they really never looked back). ICT only had its base of 1500s, 1301s, Ferrantis (which were comparatively large in value and scale but small in number systems) and EMI systems (ditto).

On the other hand ICT could well have had at that time a slightly bigger base of total EDP equipment (including tabulators, calculators and associated kit) than IBM.

In a further exchange with Virgilio we agreed that the most likely basis is the total EDP base rather than the computer base, but anyone with

access to independently published figures is welcome to settle the matter with facts!

Breaking the Mould

Reay Atkinson

A former senior civil servant argues that the failure of Government support initiatives for the computer industry stemmed from a deep-seated lack of understanding across all top levels of Government and from the inadequacies of ICL's senior management. It was only with the arrival of Kenneth Baker as IT Minister and Robb Wilmot as ICL chief executive in 1981 that the situation began to change.

In his trenchant observations on Virgilio's article, and in the specific context of strategic collaborative projects, David Talbot says "Arguably, however, it was too little, too late". In my opinion these words succinctly epitomise the *leitmotiv* of HM Government's support for the UK computer industry, both hardware and software, from the 1950s though to 1981.

This conclusion rests essentially on my belief, based on personal experience in a reasonably senior position, that at both Ministerial and higher official levels there was throughout this time scant understanding of the potential of the emerging industry, both in manufacturing terms and as regards application.

In both the scientific Civil Service and the armed forces there was extensive use of computers for operational and control purposes. Project managers up to a reasonably senior level were wholly competent in the technology and this competence infused a few more senior officers in the non-administrative service.

But, for three decades, virtually all automated data processing applications across Government were planned and implemented by executive grades and their departmental equivalents, with very little involvement and understanding on the part of Departmental heads and their immediate subordinates. Projects were "sold" these administrative staff on the basis of improved efficiency and (projected!) staff savings. But lack of understanding of computers and their potential was wide ranging and deep-seated right across the top levels of government.

There were one or two exceptions at Under Secretary (Grade 3) level, in a few Departments like Home Office, Defence and Social Security. But it was not until the mid 1970s that Permanent Secretaries like Sir Kenneth Stowe (DHSS) and Sir Frank Cooper (Defence) took serious interest in the technology. At Ministerial level, the likes of Tony Benn were generally informed sponsors.

Regrettably, it was only after Kenneth Baker (now Lord Baker of Dorking) was appointed as Minister of State in DTI in 1980 that serious involvement, with useful Prime Ministerial and Cabinet backing, replaced the spasmodic and essentially dilettante interest which characterised earlier decades. Only at this point did the expertise and professionalism available within the public service coalesce to positive and meaningful advantage.

Not until 1978 can I speak from direct involvement about actions in support of the industry in DTI and its predecessors in title. There were, in that Department, individuals of real technical competence and matching awareness of the ways of the Whitehall world, like Brian Oakley and Ivor Manley, with intermittent support from successive Chief Scientific Officers.

But there was no coherent strategy for planning and development of the industry; and massive financial support was directed to other industries like avionics, automobile manufacturer and selected developments within such manufacturers as GEC and Plessey, primarily in the defence sector. Principal support for the computer hardware industry rested on the preferential purchasing policy, primarily in favour of ICT/ICL. This limited level of support, the cost of which was born by user Departments and the Stationery Office out of their procurement budgets, was acceptable to HM Treasury!

This policy most certainly skewed the Government's thinking both on strategic planning and practical, effective support for the industry. At official level, much effort was deployed on wrangling between DTI, CC(T)A and the user departments over the application of the procurement policy to particular projects. This was mirrored at the political and Parliamentary level, where much time was devoted to the same subject both in Select Committees (eg Science and Technology) and before the Public Accounts Committee.

There was, moreover, no clear demarcation between the activities of DTI and, from 1970, the Civil Service Department concerning possible collaboration between the UK industry and particular companies in Europe, the USA and, latterly, Japan. Thus, in 1972, the Civil Service

Department (with Baker then in a junior Ministerial role) set up and participated in discussions with, for example, Univac and Nixdorf to consider possible collaboration. Baker also set up and chaired a group of leading practitioners in both manufacture and application to further advise on a range of policy issues. This was peremptorily wound up when the Labour government took office in February 1974.

Evidence of this fragmented and ineffectual state of affairs, which continued into the next Conservative administration in 1979, may be derived from the report of a sub-committee of the Advisory Council for Applied Research and Development which reported in September 1980.

Chaired by Sir Robert Clayton of GEC, and including in its membership Leighton Davies, CN Read, Steve Shirley and PE Trier, it concluded that “One Minister and Government Department should be responsible for co-ordination of government policies and actions on the promotion and development of information technology and its application through awareness, education and training, sponsorship of industry, provision of risk capital, public purchasing, publicly funded R&D, national and international regulations and standards, legislation, communications and related programmes.” In 15 further recommendations the sub-committee continued to make what in effect was a critical indictment of the then current state of affairs, and contrasted this with the situation in France.

The French comparison is important. Whatever the weakness in the ultimate products and their application, there can be no doubt that the French system, with the highly effective products of the *grandes écoles* moving easily between industry and senior positions in public administration, all of them imbued with the determination to pursue the interests of France, put that country in a strong position in Europe, certainly in its efforts to defend and develop the indigenous industry.

ICL’s efforts, admirably recorded by Virgilio, can perhaps most effectively be assessed against this background. It is a tribute to professional and middle-managerial levels that some of ICL’s developments were clearly ground-breaking. However, at the most senior levels, it would appear that there was inadequate and unsustainable involvement to ensure fully developed products.

This severely handicapped efforts to attract meaningful international interest and cooperation, and this failure was in parallel compounded by the lack of adequate government support. The diffuse and uncoordinated efforts of the UK government meant that ICL really had no realistic prospect of exploiting its technical lead effectively.

The situation was to change in 1981.

Kenneth Baker was bought back from the wilderness. A “Heath Man”, he was initially ignored by Mrs Thatcher, but used his rustication effectively in order to improve his technical awareness with Logica and to think about the industry *en tout*.

While he was working his passage as Minister of State in DTI, ICL ran into almost terminal financial difficulty. This triggered several reactions which collectively resulted in effective support for ICL. Specifically:

- at Permanent Secretary level in DTI, the question was asked seriously whether ICL was worth saving. It was! It occupied a central position in the whole IT industrial field; it had excellent hardware engineering and sound software skills; most of government’s administrative systems depended on ICL’s products; and, finally, its demise would have killed stone dead the emerging initiatives to boost significantly the UK’s IT industry;
- the declared interest of foreign (eg US) companies to hook up with ICL was exposed as a naked bid to capture market share;
- in cooperative discussion, the various government departments developed reasonably effective and acceptable ways of supporting the company;
- Robb Wilmot was brought into the company as MD. He had a very different background. He had long-standing contacts with the Japanese, who trusted him. He broke the mould.

The rest, as they say is history: “too little, too late” in the long run, but not before significant and nationally beneficial advances were made.

With Kenneth Baker now firmly established, DTI was given an unambiguous brief to support Wilmot’s clearly established objective of forming a closer working relationship with Fujitsu. A team under DTI leadership went to Japan, ostensibly to participate in a Fifth Generation Conference. The report of this team assisted Baker in his preparations for his IT Year, and helped to kick-start the industrial advances spearheaded by Alvey and its aftermath.

While this Conference was in progress DTI, working from the British Embassy in Tokyo, was providing the political ‘top cover’ to cement ICL’s alliance with Fujitsu. For the first time, in an up-front and positive way, HM Government was seriously supporting the IT Industry.

Letters to the Editor

Dear Editor,

The simple answer to Stewart Reddaway's question in his letter in issue 33 is that the DAP did not influence thinking on the transputer.

As always, reality is more complex. Although the DAP did not influence the technical thinking, it did have an effect on the transputer, because we were both competitors for government funding. This meant that I may have been less friendly towards the DAP than ought to have been the case. I think Stewart should have great credit for pioneering parallel processing in the UK, and I would like, belatedly, to thank him for that.

I am not sure that there was any particular external influence on the thinking of the transputer. I had tried to interconnect three (different) computers in 1962 (because I had a problem to solve which was beyond the capability of any of them). I had designed a simple form of data flow processor in 1963, which gave me an interest in the problem of synchronising computations, and I was introduced to the Illinois array computer in 1964 by Ted Poppelbaum. Oddly, even though I knew him well, I was not aware of Tony Hoare's work on communicating sequential processes until 1978.

I hope that Stewart will be able to write more about the DAP.

Iann Barron

By email from *iann@mynchen.demon.co.uk*

23 July 2004

Dear Editor,

I had the opportunity to read an editorial on the Internet where you went into the history of the old printers developed by ICT and ICL⁵. I found it most informative as I spent a number of years in the early 1970s as an operator on these machines. The only interesting point I found lacking in the article was information on the noise level of these old machines.

I recall that after a number of paper jams when using poor quality 3-part and 4-part paper, we as operators would leave the cover open so as to

⁵ "Impact Line Printers - an ICL Perspective" by TonyWix, *Resurrection* 24, autumn 2000.

stand a constant vigil over the machine, your head practically in the machine, checking the paper.

I would love to know what the decibel output was under those conditions. Does anyone have any record of what these were in those early days?

Thanks and regards,

Horace Bramwell

By email from *horace.bramwell@epiuse.com*

11 May 2005

Editorial contact details

Readers wishing to contact the Editor may do so by email to <wk@nenticnap.fsnet.co.uk>.

Committee of the Society

Chairman **Dr Roger Johnson FBCS**, 9 Stanhope Way, Riverhead, Sevenoaks, Kent TN13 2DZ. Tel: 020 7631 6709. Email: r.johnson@bcs.org.uk

Vice-Chairman **Tony Sale Hon FBCS**, 15 Northampton Road, Bromham, Beds MK43 8QB. Tel: 01234 822788. Email: tsale@qufaro.demon.co.uk

Secretary and Chairman, DEC Working Party **Kevin Murrell**, 25 Comet Close, Ash Vale, Aldershot, Hants GU12 5SG. Tel: 01252 683503. Email: kevin@ps8.co.uk

Treasurer **Dan Hayton**, 31 The High Street, Farnborough Village, Orpington, Kent BR6 7BQ. Tel: 01689 852186. Email: Daniel@newcomen.demon.co.uk

Science Museum representative **Tilly Blyth**, Science Museum, Exhibition Road, London SW7 2DD. Tel: 020 7942 4211. Email: tilly.blyth@nmsi.ac.uk

Museum of Science & Industry in Manchester representative **Jenny Wetton**, Museum of Science & Industry, Liverpool Road, Castlefield, Manchester M3 4JP. Tel: 0161 832 2244. Email: j.wetton@msim.org.uk

National Archives representative **David Glover**, Digital Preservation Department, National Archives, Kew, Richmond, Surrey TW9 4DU. Tel: 020 8392 5330. Email: david.glover@nationalarchives.gov.uk

Computer Museum at Bletchley Park representative **Michelle Moore**, The Computer Museum, Bletchley Park, Bletchley MK3 6EB. Tel: 07748 981391. Email: michellejmoore@hotmail.com

Chairman, Elliott 803 Working Party **John Sinclair**, 9 Plummers Lane, Haynes, Bedford MK45 3PL. Tel: 01234 381 403. Email: john@eurocom-solutions.co.uk

Chairman, Elliott 401 Working Party **Arthur Rowles**, 10 The Vineyard, Bouldnor, Yarmouth, Isle of Wight PO41 0XE Tel: 01983 761399. Email: rowles01@globalnet.co.uk

Chairman, Pegasus Working Party **Len Hewitt MBCS**, 5 Birch Grove, Kingswood, Surrey KT20 6QU. Tel: 01737 832355. Email: leonard.hewitt@ntlworld.com

Chairman, Bombe Rebuild Project **John Harper CEng MIEE MBCS**, 7 Cedar Avenue, Ickleford, Hitchin, Herts SG5 3XU. Tel: 01462 451970. Email: bombe@jharper.demon.co.uk

Chairman, Software Conservation Working Party **Dr Dave Holdsworth CEng Hon FBCS**, University Computing Service, University of Leeds, Leeds LS2 9JT. Email: ecldh@leeds.ac.uk

Digital Archivist & Chairman, Our Computer Heritage Working Party **Professor Simon Lavington FBCS FIEE CEng**, Lemon Tree Cottage, High Street, Sprooughton, Suffolk IP8 3AH: Tel: 01473 748478. Email: lavis@essex.ac.uk

Editor, Resurrection **Nicholas Enticknap**, 4 Thornton Court, Grand Drive, Raynes Park SW20 9HJ. Tel: 020 8540 5952. Email: wk@nenticknap.fsnet.co.uk

Archivist: **Hamish Carmichael FBCS**, 63 Collingwood Avenue, Tolworth, Surbiton, Surrey KT5 9PU. Tel: 020 8337 3176. Email: hamishc@globalnet.co.uk

Committee of the Society (contd)

Meetings Secretary: **Dr David Anderson**, The Wozzles, 1 Oatlands Road, Boorley Green, Hants SO32 2DE. Tel: 0239284 6668. Email: cdpa@btinternet.com

Chairman, North West Group **Tom Hinchliffe**, 44 Park Road, Disley, Cheshire SK12 2LX. Tel: 01663 765040. Email: tom.h@dial.pipex.com.

Peter Barnes FBCS, 10 The Broadway, Gustard Wood, Herts AL4 8LN. Tel: 01438 832906. Email: barnes@peterbarnes.freemove.co.uk

Chris Burton CEng FIEE FBCS, Wern Ddu Fach, Llansilin, Oswestry, Shropshire SY10 9BN. Tel: 01691 791274. Email: cpb@envex.demon.co.uk

Dr Martin Campbell-Kelly, Department of Computer Science, University of Warwick, Coventry CV4 7AL. Tel: 01203 523196. Email: mck@dcs.warwick.ac.uk

George Davis CEng Hon FBCS, 4 Digby Place, Croydon CR0 5QR. Tel: 020 8681 7784. Email: georgedavis@bcs.org.uk

Harold Gearing Hon FBCS, 14 Craft Way, Steeple Morden, Royston, Herts SG8 0PF. Tel: 01763 852567.

Peter Holland, 10 Broad Walk, Orpington, Kent BR6 7RZ. Tel: 01689 891874. Email: peterholland@care4free.net

Eric Jukes, 153 Kenilworth Crescent, Enfield, Middlesex EN1 3RG. Tel: 020 8366 6162.

Ernest Morris FBCS, 16 Copperkins Lane, Amersham, Bucks HP6 5QF. Tel: 01494 727600. Email: Ernest.Morris@btinternet.com

Dr Doron Swade CEng FBCS, 54 Park Road, Kingston-upon-Thames, Surrey KT2 6AU. Tel: 020 8392 0072. Email: doron.swade@blueyonder.co.uk

Point of Contact

Readers who have general queries to put to the Society should address them to the Secretary: contact details are given on the page opposite.

Members who move house should notify Kevin Murrell of their new address to ensure that they continue to receive copies of *Resurrection*. Those who are also members of the BCS should note that the CCS membership is different from the BCS list and so needs to be maintained separately.

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