

The Alvey Programme: footnotes

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1 Introduction

Autobiographies by the less than famous are a noted feature of the English literary world. So are pieces of “living history”, where those affected by some great event are asked for their reminiscences, which are then culled and repackaged to give a democratic-level view of what happened. This book is a mixture of these two genres, as the authors put it “a collective—and selective—personal memoir”, dominated by the recollections of Brian Oakley, who directed the Alvey Programme from 1983 to 1987, but giving a fair variety of other participants' views as told to Kenneth Owen, a freelance journalist well-known to regular readers of *Alvey News*.

As the authors lose no time in pointing out (line 3 of the Preface) it is “*not* an official history or research report”; and although it begins with a snappy chapter on “What Was Alvey?” for the uninitiated, it really takes as read the significance of the Alvey Programme, from a political or technical perspective. Readers will look in vain for a mature assessment of what it was about information technology that justified a special £350 million programme, or even of the difference the programme made to Britain's, or the world's, stock of capabilities in IT. It is not the scientist's view of Alvey. Likewise, they will not learn of any effects of the Alvey model on how companies draw up their research plans and budgets, or how the political economy of the IT markets has reacted to sustained government intervention. It is not the businessman's view, although many senior industrialists are quoted along the way.

Where this book is enlightening is in displaying the administrator's view: the ways in which the administrator contrives to “consult”, formally to take into account the expressed views of all apparently concerned, from political masters through industrial spokesmen down to academics, and then *do* something. In this way it has something to offer to all these audiences, though probably not quite what they would have asked for.

This is interesting, since the self-image, and the Civil Service reputation, of the Alvey Directorate has been as of a maverick unit, stuffed with external secondees careless of tradition and determined to get something done regardless. It is interesting that the Director, and the participants quoted, seem more exercised about their personal interactions and frustrations than the value and impact of the Programme as a whole.

Having said this, it is fair to add that the content chosen for the book makes the reviewer's task much easier. He might expect to face a dilemma, whether to do his formal duty and review the book as an analysis of the Programme, or to satisfy the presumed greater interest of his readers, and review the Programme itself. It turns out that the character and faults of the book are pretty inseparable from those it reveals in the Programme.

The structure of the book is based on the temporal order of events, taking things as they came; it does not attempt to view matters from a new and unfamiliar angle, or impose its own analysis—modest to a fault, one might say. It offers little technical exposition, though clearly a distillation of experts' received opinions underlies the discussions; decisions are reported, but not seriously defended. Although the book is filled with divergent views, clearly stated if unsupported, no attempt is made to marshal arguments in defence of anything now controversial: consensus may not

be reached, but all conclusions emerge from “judgement” alone. Above all, it offers no analysis of how to discern policy objectives which are truly in our “national interest”, or how to evaluate proposed tactics in order to achieve them.

All this seems to have characterized Oakley’s “direction” of the Programme as a whole. Talking of the regular board meetings with his directors of the sub-programmes, he recalls (pp 86–87): “I allowed discussions to ramble on, gradually allowing a consensus to emerge . . . it never really did over a few issues The long board meetings were not universally popular, and I believe that several of the directors did not really understand why I felt this approach was desirable . . .”. Reading this, one is struck anew by the complacency (or charity?) of an introductory remark of Owen’s (p. 34): “Britain is rather good at committees . . .”

Still, the book does have the virtues as well as the drawbacks of its cultural origins: the indices are excellent (including a *List of Characters* worthy of a 3-volume novel), the illustrative official documents put into appendices are terse and well-chosen, and the general style and presentation of the whole is very readable. That is quite a feat in dealing with this subject-matter, as anyone tempted to tackle the *Further Reading* will soon find out.

2 The Englishman as hero: racy but modest

The book begins and ends with blow-by-blow accounts of events: initiatives, meetings, reports, committees: the break-neck narrative takes us “from Tokyo to Number Ten”. One series of events put Alvey in business (and the account is useful in showing that there was more to it than a panic reaction to the Tokyo Fifth Generation conference of 1981); the other led to its official characterization as a completed experiment, to be learnt from, certainly, but not perpetuated as such.

The fact that things happened this way gave the book and the Programme a coherent Aristotelian form—beginning, middle and end—and enable some of the participants to express a view on the Programme as a bounded whole, most notably the director of the successor programme Timothy Walker (p. 262). He gives the best intellectual case to justify what came after Alvey: “Either the Alvey Programme helped to reduce the barriers [to collaboration] or it didn’t. If it didn’t, trying again won’t help. If it did, what else are you going to do?” Certainly, you can grasp Alvey, in a way that you cannot the ESPRIT programme, a European programme an order of magnitude greater, and which extends into the indefinite future.

But a point which is raised nowhere in the book is the danger of this finite approach in the particular context of research. Having created a community and an “ethos” under a particular funding regime, the Government risks a charge of naivete, if not of incoherence, when it cuts off 90% of the flow of funds to domestic collaboration, and expects the “market” to fulfil the shortfall. For all ESPRIT’s subservience to big electronics interests, it is immune to the charge that it has created false expectations in Europe’s research community. Research, after all, is aimed at reducing humans’ uncertainty about properties of the world about them. It is self-defeating if the Government’s approach to research support tends to increase the long-term uncertainty of the researchers about the viability and perceived value of their own work. This is no fault of the Alvey administrators themselves, of course. But one is tempted to conclude that, in Britain, even in the political climate of a continuing, strong and radical government, not enough continuity can be mustered to make sense of a five-year policy decision.

While events in committee are well covered, other events out in the country are often described allusively, in a way that makes it hard to evaluate the decisions that caused them. A prime example of this is “the Series 63 Mistake”. This event, a purchasing decision to select a new and untried GEC computer for bulk purchase, admittedly on no grounds other than patriotism, is first described roundly as “an expensive mistake” (p. 108). Forthrightly modest, coming from the pen of the decider. But no account is given of why this verdict is justified. Later, the lead-up to the decision is described in some detail, along with the complaints of the researchers who had the machines wished upon them, and the rueful admission of failure by the supplier (pp 156–160). But there is no

costing of the mistake in terms of pounds or man-years wasted. We are told that the software engineers suffered less from this than the IKBS community, again without any quantitative evidence. How significant was this misuse of Alvey funds? We do not know, and we are left doubting whether Oakley himself ever asked the question. There is an over-readiness to accept blame, which often obscures the details of the issue.

The book is quite above any suspicion of whitewashing the Programme. There are chapters entitled “Problems and Other Issues”, “Errors and Additions”, and “Was It All Worthwhile?”, but nothing explicitly on successes of the programme (though “Breaking the Mold” [sic] is pretty upbeat). Derek Barber, asked to sum up his experience as Director of Infrastructure and Communications, goes on for over a page on his frustrations and failures, interspersing just six lines on two successes (pp 141–143). Reading *Alvey*, one tends to agree with Brian Hayes, that Oakley “let his self-criticism get the better of him” (p. 197).

But in a Director, this can be a serious fault. Time and again, Oakley tells us of his regrets: not enforcing standards of administration (p. 76), putting too few resources into CAD for VLSI (p. 79), putting too much into VLSI altogether (p. 80), supporting display technology (p. 84), backing A4-size flat screen displays (p. 90), not taking Uncle projects seriously enough (p. 101). Above all, the members of the Alvey Committee, which drafted the recommendations for the Programme, agreed that they had offered an outline, not a precise plan, particularly in the choice of four technology areas (p. 43). Yet when Oakley came to set up the Programme itself, he admits that he took no account of industry’s comments on the plan (p. 57); and when Directors were to be appointed he assigned them conveniently to the four technology areas (VLSI, IKBS, Software Engineering, MMI) without further ado. Then each Director set about trying to give his area a coherent strategy. It begins to look as though Oakley, despite his background as head of the Science Research Council, was not opinionated enough to seize responsibility for the decisions that were in his power. Hence they often simply went by default.

3 Keeping technical matters in their place

This explains why the book lacks any serious appreciation of the theory behind technical issues, which would have animated the Directorate’s day-to-day decision-making, and by which the Programme must ultimately be judged.

Alvey was conceived as a unique new enterprise, inspired by a particular respect for Information Technology and by hopes for what it could deliver. One might expect its Director to have some view on why these were justified. What is so special about Information Technology? (Perhaps a penetrating analysis here would suggest when there might be a case for a similar programme to promote other technologies.) What are its constituent fields, and is there a dynamic relation between them? (Perhaps an answer to this would justify the four technology areas.) At the very least, what was it about the situation in 1981 which created the original technical momentum? On all these questions, there is silence.

There is a revealing contrast here with Sir James Lighthill’s 1972 report on AI. That *was* opinionated, and set up a simple tripartite split of the field. It is still possible to find material for debate in the definition and appropriateness of those three areas, as the other articles in this issue of the *Knowledge Engineering Review* show. But despite this debate there is consensus that, when put into an administrative context, the theoretical claim’s effect was amplified, and to the detriment of overall support for AI. It is arguable that the apparently agnostic stance of Oakley towards his field was in its own interest, in that the management of Alvey did not adopt a theoretical *parti pris*. Peer review seems to have provided in effect the theoretical guidance, with only a few strange decisions attributable to prejudice (e.g. the exclusion of database research on the grounds that UK “program manufacturers” here were scarce—p. 80). But it does mean that the Programme was “directed” only in the sense that the blind may lead the blind.

Hence Oakley blithely makes some very dubious claims about some of the theoretical areas.

- “The collaborative nature of the Alvey Programme made such cooperation [viz between researchers in speech and natural language] seem natural . . .” (p. 292). Three years after the close of Alvey it is still impossible to put together a project combining speech and natural language processing that commends itself to the distinct committees that have always presided over these two areas.
- He evinces a belief (p. 35) that the Fifth Generation programme in Japan was IKBS-led. But the leading edge of that programme was always in hardware architectures and logic programming, with IKBS seen as one potential application.
- The IKBS strategy “was always seen as a ten-year programme” (pp 81–82). If so, it no longer loomed as a priority by the time the Bide Committee prescribed a proposed content for the five years to follow Alvey. And indeed this idea of an extended timescale for IKBS had been completely lost to the tradition when I was Assistant Director with responsibilities for IKBS in 1988–90.

Moreover, Oakley’s discussion of how executive technical decisions were made suggests that he never looked beneath the technical simplifications that organized Alvey.

He tells us that in addition to setting up the Programme’s communications net, he asked Derek Barber to handle the communications research part of the programme, then adds absent-mindedly: “In fact we did not intend to carry out much communications research under the Alvey Programme. I don’t remember the Alvey Committee making any firm decision on this. It probably went by default” (p. 74).

We have seen that he accepted the MMI (Man Machine Interface) unit without serious question. He goes on to remark (p. 83) that “it was inevitably something of a ragbag, consisting of pattern processing (that is speech and image processing), display developments, and the human interface”. He then states how loose the connexions between the subject-matter of these are. But after all, who decided that all these rags should be in the same bag? And what considerations govern a choice of how to segment a set of topics so as to organize research? Is it market area, technical methods in use, the logical form of the problems to be solved, or punning and the Director’s lack of interest?

4 The key issues

Lack of technical knowledge and hence informed opinion at the top is a drawback, but not necessarily a fatal one. Much more serious is a failure to examine the strategy and tactics of the Programme as a whole.

The Alvey Programme, conceived, planned and initiated under the present Conservative government, could only have been based on the perception that world market forces, left to themselves, would not necessarily work to the UK advantage in relation to information technology. In Patrick Jenkin’s words, quoted on p. 301, “the government is convinced that this programme will ensure for British industry secure access to the new technology and the products and processes on which our future prosperity depends”. (Statement in the House of Commons, 28 April 1983.) There must have been the implicit fear that access to IT might have been denied us.

Yet whose is the national interest that we are defending here? The UK consumer of IT? There has never been any suggestion that the market for new products would be closed to him. The UK researcher, or the UK factory worker? Granted that they may find their salaries being paid by foreign-based institutions, their talents are likely to go on being recognized. (The surge of Japanese manufacturers setting up in the UK in the 1980s is now being followed by a surge of new Japanese research institutes.) The UK manager? The UK stockholder? Her Majesty’s Government? Ah, now we begin to get closer to a coherent answer, for it is these parties who are likely most immediately to find their assets depreciating, unless they can gain a firm grip on IT. UK companies will face declining profitability, and the central government, even if its revenues do not immediately decline, will find its control of the commanding heights of industry slipping or irrelevant.

In the longer term, we might expect a generalized relative decline affecting all sectors of society (cf, the effects on China of its refusal to come to terms with modern manufacturing methods in the last century), but this is less sure; and in any case seems to presume that the UK, rather than our own region, or a larger area within Europe, remains the unit whose average wealth we all care about.

Less gloomily, we might see the issue less as preventing “the UK” from falling behind in the world than as ensuring that a particular opportunity is not missed. It is arguable that a fair complement of the best IT brains in the world are still in the UK: how can we optimize the use of this great resource, to benefit all and sundry (and perhaps benefit “the UK” first and foremost)? In any case, we need to bring the potential to the attention of UK managers and investors.

This short sketch has served to identify the particular UK sectional interest that Alvey, or any successor policy, might serve. The next question is how to serve it.

An aspect of this which turns out to be crucial is the timescale on which change is to be effected. This is not just the old chestnut of “short-term”ism in the UK investment community making it impossible to provide commercial funding for serious research, although this is a real problem for individual projects. But when considering whether and how to initiate a whole programme of funding, there is also a latent danger that short-term, precipitate, action may even make less likely a long-term change in the same direction.

Despite the early delays Alvey did, for five years, channel significant money and publicity into IT research. New projects went ahead; the field’s profile in the country was raised; expectations about the future were changed. But the means was a combination of panic talk (“The Japs are coming!”) and direct public support to companies supplying and using the technology. As John Fairclough, the Government’s Chief Scientific Adviser, points out in an interesting contribution (p. 260) this support went to a sector of industry (“physics-based”) which had been used to receiving the bulk of its R&D funding from the public purse. Direct financial inducement by the Government to make them look in the IT direction would be unlikely to reduce this dependency, though it might change the composition of their research plans.

We are now going through the equivalent of a withdrawal phase, since there is much less money in the current Information Engineering programmes (contrast Alvey’s £200 m over five years with IEATP’s less than £60 m over three), and what there is is subject to far tighter restrictions on how much can be paid to support industry (the notorious “LINK rules”). As a result take-up of DTI funds has been disappointing over the last two years, and many have inferred the regime we are operating is counter-productive. In the short run, it certainly is: inevitably, programmes are evaluated by their take-up. But in the longer run, it may come to be seen as cunningly apt: companies have now received some guidance and experience in what sort of R&D could be pursued; after a bracing but chillier period, while they flatter themselves on their rationality in cutting out “unproductive” research overheads, they may begin to feel somewhat naked. When (if) they decide on new investment, it will be undertaken out of a hard-headed, long-term, reappraisal of their companies’ future, rather than the prospect of some good-time Government slush funds.

On the assumption, then, that Alvey should have been aimed towards teaching UK managers how to invest wisely in IT, what can be said of the tactics it employed?

Research was organized into distinct strategies for the different technology areas. This is an approach that makes sense from an academic point of view (cf, a teaching syllabus), since it emphasizes the intellectual interrelation of the problems in the abstract, or at least sets an agenda for “UK Ltd”. But how much does this help companies to identify what R&D their individual circumstances call for? Note that the research is organized round the technologies themselves, not the market areas in which they might find application. It is interesting that at the first meeting of the Alvey Committee itself, which set up these four areas, John Alvey of British Telecom reports (p. 35): “I began by thinking that we ought to consider what the market was, to present something that looked like a business case, otherwise we wouldn’t be credible. I flogged that for about an hour at the first meeting but very quickly got disillusioned So I gave up and agreed that we should talk enabling technologies.”

When a management consultant approaches the topic of new technology in a corporate environment, the focus is not on the current research problems of particular technologies: rather, he discusses how previous technical breakthroughs have affected past business practice and profits, and the comparative advantages of different access routes to technologies (internal research is not the only one). The focus is on exploiting new techniques, rather than developing them. How do you acquire, and make use of, certain abstract goods? Once this point is made, one sees how vast is the gap between rational management of private companies, and the approach to new technology put forward under Alvey (and since). The academics, and public policy planners, have triumphed over the entrepreneurs. With teachers like these, one is left wondering if the industrial pupils have absorbed quite the right lesson.

Even assuming that participation in more research will help UK companies' exploitation of new IT, there is clearly much more required. It is a commonplace of my experience that UK academics are now, if anything, more market-oriented than the researchers in company laboratories: the former do not know where the funding for their next project is coming from, whereas the latter often seem to flourish for years without a clear line of communication to overall management or product development. Oakley quotes approvingly (p. 226) the Japanese practice of ICOT workers returning to their firms at the end of their secondments: "so whatever progress is made at ICOT will rapidly appear in Japanese industry". But what makes him think that Japanese junior boffins have any voice in the setting of their companies' plans for development, let alone exploitation?

There was in fact a strange unease about the value of any distinctive thrust that Alvey might have been giving to its industrial participants. Consider Bill Fawcett, the VLSI Director (p. 135): "if you're putting money into GEC and Plessey for things they would not do anyway, then either Alvey has got something wrong or GEC and Plessey have. Also if we don't want to support firms like Plessey and GEC in the VLSI programme, who do we want to support? They're the ones in that business." Alvey seemed to want to carry a new gospel to UK industry, yet doubted whether the old ways admitted of any improvement!

Essential to this new gospel was the duty of cooperation or collaboration: between industry and academia, between competing firms, between suppliers and users of IT. Disappointingly, neither Oakley nor Owen give any insight into how the collaboration requirement came about. Nonetheless, this is widely seen as the greatest distinctive legacy of Alvey. By making funding largely dependent on forming a consortium, Alvey brought people together in a new way. Obviously, if more people meet, there is a chance of more productive interaction. By the same token, more effort has to go into communications, organization and management—a point it would seem that was new to Oakley himself: ". . . I was so keen to ensure good cooperation that I did not wish to insist on any one body being in the lead. In retrospect it is easy to see that a project without strong management would tend to have weak cooperation" (p. 91). It may be that, in the Britain of the early 1980s, the need was to break down barriers among academic departments and industrial firms. It certainly added to the *esprit de corps*. There is no evidence that it speeded industrial take-up of new technology.

5 Conclusions

The Alvey Programme, as conveyed (not untruly) by this book, was a happening, rather than a deliberate act. It was presided over, rather than directed, by Brian Oakley.

Its major results so far discernible, though not quite what was publicly intended, may be beneficial: a respectable body of research work completed; the "dinner party effect" of enhanced cooperation; the continuing European expenditure on the ESPRIT programme with major UK participation; the current DTI and SERC programmes aiming to wean industry of government support while retaining their interest in IT research.

The results publicly intended have not materialized: the UK has less of a VLSI industry than it did at the outset; software engineering is no closer to prescribing development methods for

software that industry can adopt; man machine interfaces are still a ragbag; and the Lighthill report on artificial intelligence still attracts defenders.

From a wider perspective, *Alvey* gives an insiders' view of how technical business gets transacted in our democracy, and is a fair substitute for meeting all the contributors for a free-ranging discussion. It is frank, well written, and without pomposity. But it will not tell you, because the authors do not seem to have considered, why information technology has deserved all the fuss.