

cc/ Mr Duguid



b2 16/12/80

to MHP.

PRIME MINISTER

... The Advisory Council on Applied Research and Development (ACARD) published its report on "Technological Change: Threats and Opportunities for the United Kingdom" at the beginning of the year. I was invited to co-ordinate the Government response, and the enclosed paper is based on the detailed consideration of the Report undertaken by the interdepartmental Industrial Policy Group (IPG). This was circulated to colleagues, and the attached paper reflects their comments. With your approval, I propose to send it under a covering letter to the Chairman of ACARD, Dr Spinks; to place the paper in the Libraries of both Houses; and to draw attention to it by means of an arranged Parliamentary Question.

2 The process of putting together the Government response has been lengthier than I would have wished, largely because of the broad nature of its subject and the diffuseness of its recommendations. In discussion with ACARD I have made it clear that I should prefer the Council to address itself to more closely defined topics; and this point, together with criticism of some other points in the report on which ACARD shows itself to be ill-informed or naive, is also made in the response.



3 I am sending copies of this letter and the enclosure to the Chancellor of the Exchequer, the Secretaries of State for Defence, Employment, the Environment, Foreign Affairs, Scotland, Wales, Northern Ireland, Social Services, Trade, Energy and Education and Science, and to the Ministers of Agriculture, Fisheries and Food and Transport, to the Lord President, the Paymaster General, Minister of State for the Civil Service Department and to Sir Robert Armstrong.

KJ

Department of Industry
Ashdown House
123 Victoria Street

16 K J
December 1980



ACARD REPORT ON TECHNOLOGICAL CHANGE

Draft Response to ACARD

Introduction

1 The report of the Advisory Council for Applied Research and Development on "Technological Change: Threats and Opportunities for the United Kingdom" was published in January 1980.

2 ACARD have made eight principal recommendations, one of which encompasses four separate recommendations on small firms. The majority of the recommendations are aimed specifically at Government, and the Report also includes seven points of a more general nature which for the purposes of this response have been treated as recommendations.

3 Technological Change is an immensely wide and diffuse subject on which conclusions are likely to remain at a fairly high level of generalisation; and the more recent ACARD reports on Biotechnology and Information Technology show that, Concentration on a closely defined topic is likely to produce more clearly focussed recommendations.

Economic Climate

4 Many of the ACARD recommendations call for greater direct Government involvement in the promotion of technological change. It is perhaps a pity that the Report omits reference to Government schemes designed to stimulate awareness and adoption of new or under-used technologies; for example the Micro-processor Applications Project, Microelectronics Industry Support Programme, the Product and Process Development Scheme.



However, the Government is convinced that the greatest contribution it can make to technological change is to create an economic climate favourable to enterprise and growth; and an important element in this, as ACARD suggests (para 2.4), is the avoidance of unnecessary changes in fiscal and economic policy. These are the primary objectives of this Government's policy. A firmer monetary policy and cuts in public expenditure are designed to secure the progressive reductions in inflation and interest rates, which are now under way. A start has been made on switching the burden of taxation from direct to indirect taxes, and on reducing excessive rates of income tax, in order to improve rewards and incentives. A variety of measures have been taken to improve the working of the market - among them the abolition of controls on foreign exchange movements, dividends and prices, changes in employment legislation and housing policy. Administrative burdens on firms are being reviewed and eased. A number of measures have been adopted, and others are under consideration, for helping small firms; an important source of innovation and new employment. ^{P.S.} Industry has welcomed these changes as offering the best prospect for financial stability and a revival of enterprise. A determination to stick to these policies, rather than the major expansion of Government involvement in industry that seems to be envisaged in some of the ACARD recommendations, is most likely to give industry the confidence to adopt new technology. When inflation and interest rates have come down, the fiscal and economic climate will by then already be found to have become more encouraging.



6 Although not discussed in the Report, adequate real profit levels are the critical influence on the ability of companies to cope with technological change. It is therefore extremely worrying that the real level of profitability, particularly in manufacturing industry, has been on a downward trend for many years, and more recently has reached damagingly low levels.

R&D Performance

7 Compared with leading OECD countries, the UK's performance over the last 15-20 years has been poor in areas such as productivity, value added per man and trade in finished manufactures. The result has been slower growth and relative economic decline. ACARD rightly identified research and development carried out by industry for its own commercial purposes as one of the most important elements in innovation leading to a strong economy. Here the UK's record is dramatically different from that of its competitors, with industrial funding of R&D falling by 10 per cent in constant price terms over the period 1967-75 whilst that in other leading OECD countries rose by an average of 30-40 per cent.

8 R&D focussed on the innovation of products and processes is increasingly important in determining industry's future performance. The Government will continue to invest in development when the private sector would probably not go ahead without help and when the results are likely to be to the public good.



The Science and Technology Act will be used for this purpose, and particular priority will be given to development projects likely to lead to marketable products.

New Industries and Services

9 Many of the new industries and services to which ACARD refers (paras 3.1 to 3.11) have already attracted the support of the Department of Energy and the Department of Industry's Research Requirements Boards at the R&D stage. In choosing projects to support, the Boards give priority to areas where industries based on new technologies might be generated and to research and development projects that can be carried through to commercial fruition. Examples include electric vehicle technology, composite materials, and process plant control and instrumentation. At the post-R&D stage, assistance is available under the Industry Act and through the NEB/^{in partnership with private enterprise}to encourage the setting up of new technology-based companies: (recent examples being the support for the robot manufacturing company Unimation in establishing production facilities in the UK, and the NEB/private sector investment in Celltech).

10 ACARD suggest (para 4.11) that many of those displaced by increased productivity should be employed in service industries, thus improving the standard of many services. They cite in support of their view the proportions of the Japanese and UK national labour forces employed in manufacturing and service industries. However, the Government doubts whether a complete picture can be drawn from simple analogies based on the



experience of countries whose economic and social developments are historically different from our own. It is customer demand, rather than the availability of surplus labour, that is likely to determine improvements in services; and the scope for such improvements to generate substantial employment is limited both by competition and the application of new service sector technology. Overmanning would be highly damaging in those service industries subject to international competition; and any significant increase in costs in the tradeable goods sector is likely to lead to price rises.

11 The Government does however recognise the importance of service sector industries. Such industries commonly flow naturally from the technologies to which they relate and whose needs they serve; and if the climate is right and the time ripe they should not need government help to make them flourish. But in some areas, and notably in the development of software systems and the like, some government support can help to stimulate and accelerate activity in rapidly-evolving fields. Thus, under existing support schemes, Department of Industry assistance to the computer services industry, directed mainly towards the development of software and systems, has amounted to approximately £14 million per year over the past three years. In view of the acknowledged importance to the UK of computer skills, the Department of Industry, within its overall budget,



will ensure that the Software Products Scheme and the Product and Process Development Scheme continue to receive priority.

Small Firms

12 The Government agree that small firms can and do play an important part in the development and application of technological change. However, it does not agree with ACARD (para 5.2) that a major new study, along the lines of the Birch Report, of the role of small firms is necessary in addition to work already in hand in the Departments of Industry and Employment. We think more we know the conditions which have been hostile to small firms. The Government's purpose in improving the economic climate is to encourage the birthrate of new firms (as well as the growth of existing firms), including high technology firms, while removing such non-market obstacles to survival as excessive taxation and form-filling over which the Government has influence.

13 The main thrust of Government assistance to small firms must continue to come through fiscal measures and by creation of a climate favouring enterprise (as discussed in para 4 above). But worthwhile assistance for small firms is already available from the taxpayer. Examples include the Microprocessor Application Project, where over half the companies assisted have a turnover of less than £2m, and the Manpower Services Commission Training Opportunities Scheme (TOPS). TOPS has recognised the importance of the small firm in job generation by the development and expansion of the New Enterprises Programmes and Small Business Courses.

14 ACARD suggest (para 4.5) that large companies with R&D



results which they do not intend to exploit commercially should be encouraged "perhaps through fiscal measures" to set up or seek out small firms better able to utilise such results. They (ACARD) do not, however, offer any practical suggestions as to how this might be done. There is evidence of increasing interest and awareness on the part of large firms of their social role in helping to create new employment where they themselves have been the main creators of redundancies, but little of this activity has so far been in the R&D field.

15 General business advice and technical counselling is already available from a number of sources, such as the Department of Industry's Small Firms Service, through CoSIRA in rural areas and through the SDA and WDA in Scotland and Wales respectively. However, the Government will continue to examine what further help can be given to small firms, including the possibility of a scheme to encourage more small companies to take up Research Association membership.

Technology Transfer

16 The Government concur with the ACARD comments on the importance of the transfer of technology into the UK. As well as lagging behind other industrial economies in its spending on industrial R&D, the UK's technological payments to, and receipts from, other industrialised countries are also lower than those of our major competitors. The National Research Development Corporation (NRDC) is already assisting innovation in industry in this country. To assist with the transfer of technology, the



NRDC has engaged consultants in the USA to seek out new products or processes which have been successful there, but which have not yet been launched in Europe. The NRDC will then seek an option to exploit the innovation while a suitable UK manufacturer is sought to take on the licence. The Government do not believe therefore, that a new agency is necessary for the purpose of assisting the transfer of technology into the UK (para 6.8). The task with the transfer of technology is to encourage UK industry, as their foreign competitors are, to a large extent, apparently so encouraged/^{to make more use} of the opportunities for them in this direction.- and we see the change of economic climate as serving this purpose too.

17 While the Government accept the recommendation (para 6.9) that staffing policies in both technical and commercial sections of major overseas posts should be reviewed to see whether more engineers should be appointed to them, any increase in this aspect of embassy work could only be undertaken at the expense of other, perhaps equally important, work in the post. The Government is determined to reduce the size of the Civil Service, and any cuts must be shared between the Home and Diplomatic Service.

18 The Department of Industry is however planning to make some funds available for special studies to be undertaken in Japan of technological developments there and especially on opportunities for joint ventures and licensing agreements. These studies are likely to be undertaken by locally employed consultants, who will complement the work of the existing Science and Technology Counsellor.



Overseas Projects

19 The reference in the ACARD Report (para 4.3) to large export orders, and the recommendation that the machinery for tendering for large overseas projects be examined, appear to be peripheral to the subject of the Report and remote from the terms of reference ACARD had set themselves. Concern was expressed about this subject for a number of years, and in response the Department of Trade established in 1972 the Overseas Projects Board which represented both the public and private sectors concerned with overseas projects. Much progress has since been made in establishing a closer relationship between these two sectors. OPG was involved in many successful tenders for valuable overseas projects. In 1980 the work of OPG was taken over by the new Projects and Export Policy Division, which is part of the Department of Trade but also provides a common service to the Department of Industry.

Public Purchasing

20 The Department of Industry is taking the lead in initiating measures to increase the enlightened use of public sector purchasing to improve the performance and competitiveness of United Kingdom industry, both at home and abroad.

ACARD's comment (para 4.14) on the use of the public sector's purchasing power to improve our competitiveness in overseas trade is under separate consideration in the light of the Council's further report on R&D in public purchasing.



Training and Education

21 ACARD consider the impact of technological change on education and training in paragraphs 5.4-5.8 of the report. The Government fully shares ACARD's view that technological change has considerable implications for the organisation of education and training (5.4). Government policy on industrial training was outlined by the Secretary of State for Employment on 26 November. There is a need for greater flexibility in training arrangements to meet the changing demands of industry, and in particular, a need for wider opportunities for the training and re-training of adults. Deficiencies in training at technical level must be remedied if the best use is to be made of new technology in modernising the economy (see para 5.5). The Manpower Services Commission has recently been asked to come forward with a scheme of distance learning - an "Open Tech" - in conjunction with existing technical colleges and colleges of further education. More generally, the Department of Employment are considering with the MSC and those concerned in industry and education, proposals which would enable progress to be made on all these training issues. The Government expect to publish these proposals in the New Year. The specific suggestions in para 5.6 of the ACARD report for increasing the public sector's responsibility and for an earnings related "training benefit" will need to be considered in this context.

/The ...



The Government also recognise the need to improve the supply of graduates in fast growing branches of technology (including electronics, computer science and information technology). The Government is proposing to recommend the setting up of a new engineering body under Royal Charter following the recommendations of the Finniston Committee Report. This body will make a contribution to the development of engineering courses and the Government is considering what other action needs to be taken.

Sectoral Activity: EDCs and SWPs Requirements Boards and Research Associations

22 Two specific recommendations by ACARD concern the involvement of the National Economic Development Council and its tripartite sectoral Committees (para 6.5). It is already part of the remit of EDCs and SWPs to consider technological change as part of their work to improve the performance of their industries. They were asked to give particular emphasis to this work in 1979. A number have identified needs and opportunities for technological change and made recommendations to management and unions in their industries.

/However ...



However, in competitive conditions the job of developing technological strategies - which presumably should be one element in corporate strategies - is clearly a matter for individual companies. The role of EDCs and SWPs is therefore less to draw up strategies for their industries than to influence the strategies of individual companies. This process of influence can be difficult, particularly in highly fragmented industries.

23 The reference to the involvement of Requirements Boards and the Research Associations with the development of technology strategies perhaps takes insufficient account of present efforts and past experience. The Requirements Boards have devoted considerable effort to establish priorities for the allocation of funds that they control and have sought close links with the EDCs and SWPs. However, the EDCs and SWPs cover less than 50% of the output of UK manufacturing, and it is therefore necessary to supplement these links with wider discussions. The Government's influence on Research Associations is now largely through the contracts that it places with them, although there are frequent policy discussions between officials and RA management. In recent years the Research Councils have taken more account of what industry wants and are willing to finance by research contracts. The Department of Industry has encouraged them in this approach and has links with a number of programmes.

24 The ACARD recommendation (para 6.5) on the interfaces between EDCs/SWPs and industrial sectors touches on an area where action is already in hand. The Steering Brief issued by the NEDC to EDCs and SWPs early in 1979 asked the sectoral groups to



investigate the application of advanced technologies, including microelectronics, in their own and customer industries. A number of maker/user groups have been established between EDCs and SWPs bringing together traditional suppliers of manufacturing machinery and those of advance control systems and information technologies. These joint groups have identified specific supply problems and ~~consumer~~ technological gaps in development and production. Their work has also underlined the importance of formulating acceptable national and international standards to combat problems of incompatibility of equipment. While the Government will encourage EDCs/SWPs to continue with some aspects of this work, it is not the proper function of the sectoral groups to become more deeply involved in detailed R&D considerations. Nor does the Government believe that individual company representatives would welcome such a move.

Key Materials

25 The Government agree with the ACARD comment (para 3.7) on the availability of key materials. An announcement was made in Parliament on 19 May that industry were to be consulted on the prospects for the supply of essential minerals and the desirability of measures to improve continuity and security of supplies. The Government are now considering the results of these consultations. A proposed European Community R&D Programme on substitution is being supported by the UK.

Conclusion

26 The Government welcomes the public attention that this ACARD Report has brought to the area of technological change, and will



keep under review those recommendations where further action may be needed. But it cannot accept that the role of the public sector should be expanded in the present economic circumstances. The creation of a climate favourable to enterprise and risk-taking remains the principal contribution that the Government can make to technological change.

Department of Industry

December 1980



cc HMT DHSS
MOD D/T
D/EMP D/N
DOE DES
FCO MAFF
SO D/TRNS
WO LPO
NIO PGO
MS/CSD
CO

HS

10 DOWNING STREET

From the Private Secretary

22 December 1980

The Prime Minister has seen the Secretary of State for Industry's minute of 16 December about the ACARD Report on Technological Change: Threats and Opportunities for the United Kingdom.

She is grateful for the work which has been put into the preparation of the draft Government response forwarded by your Secretary of State. She is content that this should now be issued through the arrangements proposed in the minute.

I am sending copies of this letter to John Wiggins (H.M. Treasury), Brian Norbury (Ministry of Defence), Richard Dykes (Department of Employment), David Edmonds (Department of the Environment), Roderic Lyne (Foreign and Commonwealth Office), Godfrey Robson (Scottish Office), John Craig (Welsh Office), Mike Hopkins (Northern Ireland Office), Don Brereton (Department of Health and Social Security), Stuart Hampson (Department of Trade), Julian West (Department of Energy), Peter Shaw (Department of Education and Science), Kate Timms (Ministry of Agriculture, Fisheries and Food), Tony Mayer (Department of Transport), Jim Buckley (Lord President's Office), Richard Prescott (Paymaster General's Office), Geoffrey Green (Civil Service Department) and David Wright (Cabinet Office).

M. A. PATTISON

Mrs. Catherine Bell,
Department of Industry.

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NBRM

MAD
201

Treasury Chambers, Parliament Street, SW1P 3AG
01-233 3000

19 January 1981

M.A. Pattison Esq.
10 Downing Street
LONDON
SW1

Dear Mike,

ACARD REPORT ON TECHNOLOGICAL CHANGE

You wrote to Catherine Bell on 22 December to say that the Prime Minister was content with the draft Government response attached to your Secretary of State's minute of 16 December.

The Prime Minister may be interested to see a copy of the Chancellor's letter of 9 January to the Secretary of State for Industry which proposes a few changes to the draft response.

I am sending copies of this letter to recipients of copies of your letter of 22 December.

Yours ever

Peter

P.S. JENKINS
Private Secretary

cc: CST
FST
Sir D Wass
Mr Ryrle
Mr Middleton
Mr Dixon
Mr Lovell
Mr Unwin
Mr Patterson
Mr Ridley
Mr Gordon
Mr Andren

31/5/81

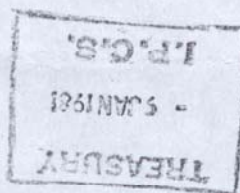


Treasury Chambers, Parliament Street, SW1P 3AG
01-233 3000

9 January 1981

The Rt. Hon. Sir Keith Joseph Bt MP
Secretary of State for Industry

[Handwritten signature]



ACARD REPORT ON TECHNOLOGICAL CHANGE

On reading the draft Government response to the ACARD report on "Technological Change: Threats and Opportunities for the United Kingdom" attached to your minute of 16 December to the Prime Minister I noticed that you had made no mention of our decision to provide additional funds for supporting industrial R and D Spending. I suggest it is worth a mention. If you agree, you might cover this by amending the second sentence of paragraph 8 to read as follows:

"In recognition of this the Government announced in November that it would be making additional funds available to support industrial R and D expenditure which would probably not go ahead without support from public funds".

I also feel the last two sentences of the final paragraph look a little odd when we have just announced increased public support for R and D and we propose saying in the Government response to the ACARD report on Computer Aided Design and Manufacture that "Government support for R and D is important at the early stages of innovation where the risk is greatest and where companies may under-invest due to poor profits and low liquidity". Perhaps these sentences could be amended to read as follows:

"But it cannot accept that a much greater degree of Government involvement in promoting technological change is the best way of improving industry's performance. Experience in this country and elsewhere has shown that the creation of a climate favourable to enterprise and risk taking remains the principle contribution governments can make to promoting technological change."

/Finally,

306/1



Finally, in view of the strong criticism we have been facing in recent months from certain parts of industry, it might be as well to say "industry has generally welcomed these changes as offering the best prospect for financial stability and a revival of enterprise" in the first sentence of paragraph 5.

GEOFFREY HOWE

A handwritten signature in black ink, appearing to be "G. Howe", written above a horizontal line.

A second handwritten signature in black ink, appearing to be "John", written above a horizontal line.



DEPARTMENT OF INDUSTRY
 ASHDOWN HOUSE
 123 VICTORIA STREET
 LONDON SW1E 6RB
 TELEPHONE DIRECT LINE 01-212 3301
 SWITCHBOARD 01-212 7676

Secretary of State for Industry

29 January 1981

The Rt Hon Geoffrey Howe QC MP
 Chancellor of the Exchequer
 HM Treasury
 Treasury Chambers
 Parliament Street
 London SW1P 3AG

✓
 MP

Dear Geoffrey,

ACARD REPORT ON TECHNOLOGICAL CHANGE

You wrote to me on 9 January suggesting some amendments to the draft Government response to this ACARD report to take account of the additional funds recently made available for supporting industrial R&D spending. Your letter was subsequently copied to the Prime Minister and colleagues as before.

2 I agree that we should include a reference to this support and I accept your suggestion for amendments to the final paragraph of the draft response, and the small addition in paragraph 5. However, in paragraph 8, I am reluctant to lose the reference to the Government's investment in development for the public good and I would like to suggest that the second sentence of the paragraph remains unchanged, and that your amendment forms a new third sentence. I believe the two sentences are complementary and can see advantages in dealing with the changes in this way. As I said in my minute to the Prime Minister on 16 December, the Government's response to this report has already been seriously delayed and I believe that we should make every effort to despatch the response as soon as possible. Unless I hear to the contrary by 4 February, I propose to send the response to the Chairman of ACARD in its revised form and to draw attention to it by means of a Parliamentary Question, as agreed.

3 I am sending copies of this letter, together with a copy of the revised draft response (with the amendments sidelined) to the Prime Minister and colleagues as before.

*Yours faithfully,
 C. Carr-Saunders*



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Draft Response to ACARD

Introduction

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the Product and Process Development Scheme. However, the Government is convinced that the greatest contribution it can make to technological change is to create an economic climate favourable to enterprise and growth; and an important element in this, as ACARD suggests (para 2.4), is the avoidance of unnecessary changes in fiscal and economic policy. These are the primary objectives of this Government's policy. A firmer monetary policy and cuts in public expenditure are designed to secure the progressive reductions in inflation and interest rates, which are now under way. A start has been made on switching the burden of taxation from direct to indirect taxes, and on reducing excessive rates of income tax, in order to improve rewards and incentives. A variety of measures have been taken to improve the working of the market - among them the abolition of controls on foreign exchange movements, dividends and prices, changes in employment legislation and housing policy. Administrative burdens on firms are being reviewed and eased. A number of measures have been adopted, and others are under consideration, for helping small firms; an important source of innovation and new employment.

5 Industry has generally welcomed these changes as offering the best prospect for financial stability and a revival of enterprise. A determination to stick to these policies, rather than the major expansion of Government involvement in industry that seems to be envisaged in some of the ACARD recommendations, is most likely to give industry the confidence to adopt new technology. When inflation and interest rates have come down, the fiscal and economic climate will by then already be found to have become more encouraging.



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engineering body under Royal Charter following the recommendations of the Finniston Committee Report. This body will make a contribution to the development of engineering courses and the Government is considering what other action needs to be taken.

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become more deeply involved in detailed R & D considerations. Nor does the Government believe that individual company representatives would welcome such a move.

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Conclusion

26 The Government welcomes the public attention that this ACARD Report has brought to the area of technological change, and will keep under review those recommendations where further action may be needed. But it cannot accept that a much greater degree of Government involvement in promoting technological change is the best way of improving industry's performance. Experience in this country and elsewhere has shown that the creation of a climate favourable to enterprise and risk-taking remains the principal contribution that the Government can make to technological change.

Department of Industry
January 1981

29 JAN 1981





Secretary of State for Industry

DEPARTMENT OF INDUSTRY
ASHDOWN HOUSE
123 VICTORIA STREET
LONDON SW1E 6RB
TELEPHONE DIRECT LINE 01-212 3301
SWITCHBOARD 01-212 7676

12 February 1981

Dr A Spinks CBE FRS
Chairman
Advisory Council on Applied Research
and Development
Cabinet Office
70 Whitehall
London SW1

Mr D Spinks.

You will be aware that the Prime Minister asked me to co-ordinate our response to your Council's report on "Technological Change: Threats and Opportunities for the United Kingdom".

I enclose the response. I regret that it has been delayed although this is partly attributable to the broad nature of the subject. I have already put to you my own preference for the Council to address itself to more closely defined topics - and have mentioned this again in the response. I believe this should be an important consideration in planning AGARD's investigations and I look forward to reading future reports.

I intend to draw attention to the Government's response through a reply to a written Parliamentary Question in the next few days, when copies of the response paper will be placed in the libraries of the House.

I am sending copies of this letter and the response paper to the Prime Minister and colleagues whose Departments have been involved in its preparation.

*Erinda
Kam Joseph*



ACARD REPORT ON TECHNOLOGICAL CHANGE: THREATS AND OPPORTUNITIES FOR
THE UNITED KINGDOM

Government Response

Introduction

1 The report of the Advisory Council for Applied Research and Development on "Technological Change: Threats and Opportunities for the United Kingdom" was published in January 1980.

2 ACARD have made eight principal recommendations, one of which encompasses four separate recommendations on small firms. The majority of the recommendations are aimed specifically at Government, and the Report also includes seven points of a more general nature which for the purposes of this response have been treated as recommendations.

3 Technological Change is an immensely wide and diffuse subject on which conclusions are likely to remain at a fairly high level of generalisation; and the more recent ACARD reports on Biotechnology and Information Technology show that concentration on a closely defined topic is likely to produce more clearly focussed recommendations.

Economic Climate

4 Many of the ACARD recommendations call for greater direct Government involvement in the promotion of technological change. It is perhaps a pity that the Report omits reference to Government schemes designed to stimulate awareness and adoption of new or under-used technologies; for example the Microprocessor Applications Project, Microelectronics Industry Support Programme,



the Product and Process Development Scheme. However, the Government is convinced that the greatest contribution it can make to technological change is to create an economic climate favourable to enterprise and growth; and an important element in this, as ACARD suggests (para 2.4), is the avoidance of unnecessary changes in fiscal and economic policy. These are the primary objectives of this Government's policy. A firmer monetary policy and cuts in public expenditure are designed to secure the progressive reductions in inflation and interest rates, which are now under way. A start has been made on switching the burden of taxation from direct to indirect taxes, and on reducing excessive rates of income tax, in order to improve rewards and incentives. A variety of measures have been taken to improve the working of the market - among them the abolition of controls on foreign exchange movements, dividends and prices, changes in employment legislation and housing policy. Administrative burdens on firms are being reviewed and eased. A number of measures have been adopted, and others are under consideration, for helping small firms; an important source of innovation and new employment.

5 Industry has generally welcomed these changes as offering the best prospect for financial stability and a revival of enterprise. A determination to stick to these policies, rather than the major expansion of Government involvement in industry that seems to be envisaged in some of the ACARD recommendations, is most likely to give industry the confidence to adopt new technology. When inflation and interest rates have come down, the fiscal and economic climate will by then already be found to have become more encouraging.



6 Although not discussed in the Report, adequate real profit levels are the critical influence on the ability of companies to cope with technological change. It is therefore extremely worrying that the real level of profitability, particularly in manufacturing industry, has been on a downward trend for many years, and more recently has reached damagingly low levels.

R & D Performance

7 Compared with leading OECD countries, the UK's performance over the last 15-20 years has been poor in areas such as productivity, value added per man and trade in finished manufactures. The result has been slower growth and relative economic decline. ACARD rightly identified research and development carried out by industry for its own commercial purposes as one of the most important elements in innovation leading to a strong economy. Here the UK's record is dramatically different from that of its competitors, with industrial funding of R & D falling by 10 per cent in constant price terms over the period 1967-75 whilst that in other leading OECD countries rose by an average of 30-40 per cent.

8 R & D focussed on the innovation of products and processes is increasingly important in determining industry's future performance. The Government will continue to invest in development when the private sector would probably not go ahead without help and when the results are likely to be to the public good. In recognition of this, the Government announced in November that it would be making additional funds available to support industrial



R & D expenditure which would probably not go ahead without support from public funds. The Science and Technology Act will be used for this purpose, and particular priority will be given to development projects likely to lead to marketable products.

New Industries and Services

9 Many of the new industries and services to which ACARD refers (paras 3.1 to 3.11) have already attracted the support of the Department of Energy and the Department of Industry's Research Requirements Boards at the R & D stage. In choosing projects to support, the Boards give priority to areas where industries based on new technologies might be generated and to research and development projects that can be carried through to commercial fruition. Examples include electric vehicle technology, composite materials, and process plant control and instrumentation. At the post-R & D stage, assistance is available under the Industry Act and through the NEB in partnership with private enterprise to encourage the setting up of new technology-based companies: (recent examples being the support for the robot manufacturing company Unimation in establishing production facilities in the UK, and the NEB private sector investment in Celltech).

10 ACARD suggest (para 4.11) that many of those displaced by increased productivity should be employed in service industries, thus improving the standard of many services. They cite in support of their view the proportions of the Japanese and UK national labour forces employed in manufacturing and service industries. However, the Government doubts whether a complete picture can be drawn from simple analogies based on the experience



of countries whose economic and social developments are historically different from our own. It is customer demand, rather than the availability of surplus labour, that is likely to determine improvements in services; and the scope for such improvements to generate substantial employment is limited both by competition and the application of new service sector technology. Overmanning would be highly damaging in those service industries subject to international competition; and any significant increase in costs in the tradeable goods sector is likely to lead to price rises.

11 The Government does however recognise the importance of service sector industries. Such industries commonly flow naturally from the technologies to which they relate and whose needs they serve; and if the climate is right and the time ripe they should not need government help to make them flourish. But in some areas, and notably in the development of software systems and the like, some support can help to stimulate and accelerate activity in rapidly-evolving fields. Thus, under existing support schemes, Department of Industry assistance to the computer services industry, directed mainly towards the development of software and systems, has amounted to approximately £1½ million per year over the past three years. In view of the acknowledged importance to the UK of computer skills, the Department of Industry, within its overall budget, will ensure that the Software Products Scheme and the Product and Process Development Scheme continue to receive priority.



Small Firms

12 The Government agree that small firms can and do play an important part in the development and application of technological change. However, it does not agree with ACARD (para 5.2) that a major new study, along the lines of the Birch Report, of the role of small firms is necessary in addition to work already in hand in the Departments of Industry and Employment. We think we know the conditions which have been hostile to small firms. The Government's purpose in improving the economic climate is to encourage the birthrate of new firms (as well as the growth of existing firms) including high technology firms, while removing such non-market obstacles to survival as excessive taxation and form-filling over which the Government has influence.

13 The main thrust of Government assistance to small firms must continue to come through fiscal measures and by creation of a climate favouring enterprise (as discussed in para 4 above). But worthwhile assistance for small firms is already available from the taxpayer. Examples include the Microprocessor Application Project, where over half the companies assisted have a turnover of less than £2m, and the Manpower Services Commission Training Opportunities Scheme (TOPS). TOPS has recognised the importance of the small firm in job generation by the Development and expansion of the New Enterprises Programmes and Small Business Courses.

14 ACARD suggest (para 4.5) that large companies with R & D results which they do not intend to exploit commercially should be encouraged "perhaps through fiscal measures" to set up or seek



out small firms better able to utilise such results. They (ACARD) do not, however, offer any practical suggestions as to how this might be done. There is evidence of increasing interest and awareness on the part of large firms of their social role in helping to create new employment where they themselves have been the main creators of redundancies, but little of this activity has so far been in the R & D field.

15 General business advice and technical counselling is already available from a number of sources, such as the Department of Industry's Small Firms Service, through CoSIRA in rural areas and through the SDA, WDA and LEDU in Scotland, Wales and Northern Ireland respectively. However, the Government will continue to examine what further help can be given to small firms, including the possibility of a scheme to encourage more small companies to take up Research Association membership.

Technology Transfer

16 The Government concur with the ACARD comments on the importance of the transfer of technology into the UK. As well as lagging behind other industrial economies in its spending on industrial R & D, the UK's technological payments to, and receipts from, other industrialised countries are also lower than those of our major competitors. The National Research Development Corporation (NRDC) is already assisting innovation in industry in this country. To assist with the transfer of technology, the NRDC has engaged



consultants in the USA to seek out new products or processes which have been successful there, but which have not yet been launched in Europe. The NRDC will then seek an option to exploit the innovation while a suitable UK manufacturer is sought to take on the licence. The Government do not believe therefore, that a new agency is necessary for the purpose of assisting the transfer of technology into the UK (para 6.8). The task with the transfer of technology is to encourage UK industry, as their foreign competitors are, to a large extent, apparently so encouraged to make more use of the opportunities for them in this direction - and we see the change of economic climate as serving this purpose too.

17 While the Government accept the recommendation (para 6.9) that staffing policies in both technical and commercial sections of major overseas posts should be reviewed to see whether more engineers should be appointed to them, any increase in this aspect of embassy work could only be undertaken at the expense of other, perhaps equally important, work in the post. The Government is determined to reduce the size of the Civil Service, and any cuts must be shared between the Home and Diplomatic Service.

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Department of Industry
February 1981

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MR PATTISON

RESPONSES TO ACARD REPORTS

You will wish to be aware of the attached replies of the Chairman of ACARD to the Government's responses to three ACARD reports:

'Technological Change', 'Computer Aided Design and Manufacture' and 'Biotechnology'. Of the three, the reply on 'Biotechnology' is the most vigorous and reflects a fairly general unhappiness in industry and the universities with the White Paper. The other two replies are more modest in tone.

*29/4/81 —
Science
& Technology
Jan 80*

16/4/81

R H ARAM

Cabinet Office
6 May 1981

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c.c. R. Courtney. ✓



ADVISORY COUNCIL FOR APPLIED RESEARCH AND DEVELOPMENT

70 Whitehall, London SW1A 2AS Telephone: 01-233

29 April, 1981.

Dear Sir Keith

Response to ACARD Report: "Technological Change:
Threats and Opportunities for the U.K."

You wrote to me on the 12 February with the Government's response to this ACARD report. The Council considered the response at its meeting on 12 March and invited me to reflect its views in a letter to you.

Both the response and your covering letter indicated a preference for ACARD to examine closely focussed, clearly defined topics. The Council noted this and agreed that most of its reports should concern such topics. It did not consider, however, that broader topics could or should be excluded. One function of ACARD is to comment on the implications of technological development for government policies and this necessarily involves the Council in some consideration of broad issues. I might perhaps add that the sales of this particular report have been considerably larger than those of some of our specialised reports, indicating substantial public interest in the general subject of technological change and its implications. I believe that the Council should continue to promote increased public awareness of such issues, and hope that you will support this.

The Government response suggested that ACARD had called for a major expansion of Government involvement in industry. The Council considered this to be a misunderstanding of the report's main theme. Our position was aptly summed up by the Prime Minister in a Parliamentary answer to Mr. Ian Mills on 14 January when she referred to Government developing with industry a framework in which industry can take R and D (and other) decisions. Recent NEDO reports have identified industries with growth potential and others where decline seems inevitable. The CBI have recently published a report that suggests comparable priorities. Such studies could facilitate the creation by Government and industry of a coherent basis for the development of technological strategies. The Council would look upon this as constructive and helpful intervention and would welcome further development of it.

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29 April, 1981.

The response rightly pointed out the crucial part played by adequate profit in enabling industry to cope with technological change. It did not, however, refer to the long-lead times usually needed to establish significant change. Without appropriate investment now, industry will not be ready to take advantage of the opportunities opened up when the world economic climate improves. ACARD therefore welcomes the extra assistance for industry to which the response referred and urges that this should be given priority in the Government's spending programme since future industrial success will be founded on developments now taking place in new technologies. ACARD reports "Biotechnology" and "Information Technology" have discussed such opportunities in more detail. In this connection, the Council noted with some concern the apparent weakening of industrial support for Research Associations as a consequence of the recession.

I might add that long-lead times are a feature of higher education also, and that at the ACARD meeting considerable concern was expressed at the Government's slow response to the Finniston Report, and its policies on overseas students' fees, both of which are adversely affecting the ability of universities and other institutions of higher education to produce the skilled scientists and engineers required in the future.

It was, of course, never the intention of ACARD to suggest that service industries should deliberately take on more staff and thereby become uncompetitive. But we believe that employment growth in the future will be concentrated in the service sector: therefore, special attention needs to be paid to the development of that sector. The Council was pleased to note the support given to the development of the computer service industry. We hope that similar support will be available in other service activities, so that Government support schemes do not concentrate exclusively or excessively on manufacturing, critically important as that obviously is.

Finally, the Council was disappointed that the Government did not give adequate consideration to the proposal for tax incentives to encourage large firms to make available to small firms inventions that they themselves cannot use. With its limited resources, ACARD is not equipped to examine the detailed working-out of such an idea and it does seem an inadequate response on the part of Government for the proposal to be dismissed because no practical suggestions for its implementation were included in the Report. There is, I feel a parallel between this and the ACARD suggestion

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- 3 - 29 April, 1981.

in "Industrial Innovation" for a loan guarantee system for small firms which, despite administrative difficulties, has now been implemented by the Government.

Kind regards,

Yours sincerely
A. Spinks

Dr. A. Spinks.

The Rt. Hon. Sir Keith Joseph, MP.,
Department of Industry,
Ashdown House,
123 Victoria Street,
London, SW1E 6RB.



ADVISORY COUNCIL FOR APPLIED RESEARCH AND DEVELOPMENT

70 Whitehall, London SW1A 2AS Telephone: 01-233

16 April, 1981.

See Sir Keith,

On 29 January you kindly sent me a departmental response to the Advisory Council's Report on Computer Aided Design and Manufacture. The paper has been considered by members of the Council's original Working Group and discussed at the March meeting of ACARD.

The Working Group and the Council were pleased to note the number of their recommendations that have been accepted by Government. It is regrettable that a different impression was given by several press reports that focussed on recommendations that were not accepted.

We do not think that continuing dialogue at this time between the Department of Industry and the Council is necessary or likely to be productive. ACARD would prefer to return to the topic in about a year's time to review progress in the context of its recommendations and the Government's response. Therefore, we do not expect a further response to the detailed points set out in the rest of this letter, but they may interest Departments concerned.

- 1) Our Working Group was unable to obtain much information on Government activities during its studies. ACARD therefore believes that, in the light of the comment that Government is itself a user of CAD/CAM, Departments should do more, subject only to the limits of security, to make their activities and their successes with CAD/CAM known to appropriate parts of British Industry.
- 2) ACARD had not expected that, at this time of financial stringency, there could be a physical move of the CAD Centre and the National Engineering Laboratory to one location. It has been glad to learn that a single Director of the two organisations has been appointed. The Government response leaves the Council with the impression, however, that this Director could promote more coordination of the two establishments' activities, for example, dissemination of information, and training.



ADVISORY COUNCIL FOR APPLIED RESEARCH AND DEVELOPMENT

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- 3) ACARD welcomes information being made available through the Scientific Counsellors in Embassies on activities in other countries. It was particularly pleased to learn of the excellent flow of information on electronics coming back from the Scientific Counsellor in Tokyo who was appointed about a year ago. Earlier, I had been, personally, impressed by discussions at our scientific offices in Tokyo and Washington.
- 4) Some parts of the Government response are centred on the activity of the Mechanical Engineering and Machine Tools Requirements Board and the Computer Aided Engineering Panel of the Department of Industry. Members of ACARD are concerned that interest in computer aided design and computer aided manufacture extends outside the interests of this Board. The electronics industry for example is an extensive user of these techniques and also has a role to play in the supply of CAD/CAM equipment and software.
- 5) The Council has noted that the Department of Industry believes that the encouragement of the use of CAD/CAM equipment through leasing is a matter entirely for the commercial suppliers of equipment and that there are no plans to provide financial support for this purpose.
- It was reported in *The Times* on 11 February that the Government has decided to assist the introduction of more robots in industry by paying 25% of the cost of new processes that adopt robots as prime constituents. We believe that it is also possible under the Product and Process Development Scheme for prototypes of new equipment, such as that for CAD/CAM, produced by British manufacturers to be placed on trial with British users. The introduction of CAD/CAM into industry is, we believe, as urgent and important as the introduction of robots and the Council therefore assumes that financial support under such schemes could be made available for CAD/CAM.
- 6) The Council thinks that there may have been a misunderstanding about Recommendation 8, on which in any case a response is awaited from the National Economic Development Council. ACARD did not have in mind that British manufacturers should at this time attempt to compete with the American manufacturers



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of large turnkey systems, but believed that the need for smaller cheaper systems, for use in small companies and in education, could provide an opportunity for a British company.

Comments in the response on software development in universities and public sector research establishments are not, we believe, relevant to this proposal. The comment that as many as thirty projects are being supported by NRDC and that a further twenty-five projects are under assessment suggests that there may be proliferations to the point where individual projects are hardly substantial or perhaps worthwhile. The response to Recommendation 11, that there are at least forty organisations currently offering 'various CAD services', raises the same question.

Dr. Duncan Davies was present at the meeting of ACARD at which all these points were discussed and we are sure that the Department of Industry will give them further consideration. As I suggested at the beginning of this letter, an immediate response would not really be profitable. I propose that ACARD should consider, in a year or so's time, whether it should review progress on this topic.

Dr. A. Spinks.

The Rt. Hon. Sir Keith Joseph, MP.,
Department of Industry,
Ashdown House,
123 Victoria Street,
LONDON, SW1E 6RB.