JPM02D7B

cc J. Wyn Jones
P. Warry.

DEPARTMENT OF EDUCATION AND SCIENCE

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FROM THE SECRETARY OF STATE

Mark Addison Esq
Private Secretary
10 Downing Street
London SW1

17 May 1985

Dear Mark.

I attach a brief for the Prime Minister's use at her meeting with industrialists on Tuesday 21 May.

I am copying this to John Graham (Scottish Office), David Normington (DE), John Mogg (DTI) and Leigh Lewis (for the Minister without Portfolio), and to Sir Robin Nicholson and Richard Hatfield (Cabinet Office).

Yours ever,

Claire Jones

pp. MISS C E HODKINSON
Private Secretary

DES to provide background note and line to take on Green Paper.

20 MAY 1985

HANDLING OF THE MEETING

Opening Statement

already put in her letter

To open the meeting the Prime Minister could make the following points:

(i) Much progress has been made in the past few years to bring industry and higher education closer together. This meeting is an opportunity to give that progress a new momentum.

(ii) The Government wants higher education to respond to industry's needs and industry to exploit the brain power, creativity and skills of higher education.

(iii) The Government is committed to holding public expenditure down and has no intention of throwing money at any problem. Even so new money has been found for "the switch". [This is the nickname for action to increase the output of engineering and technology graduates and postgraduates]. £31 million of the £43 million was transferred to the DES programme by cuts in DTI, Department of Employment and other programmes. The other £12 million is UGC money redeployed from other purposes. The decision to give such priority to "the switch" is a response to industry's advice channelled through the Engineering Council and John Butcher's IT Skills Shortages Committee. It is now up to industry to respond to the Government's action.

(iv) To make a success of "the switch" the chosen universities and polytechnics need more help from industry in the

form of:

(a) Equipment

(b) Teaching Staff - this is vital because university salaries are not competitive and, unless industry helps, the planned increase in graduate output may not be achieveable.

(c) Placements for students on sandwich courses.

(d) Active help with the design of courses.

(e) A readiness to offer worthwhile initial jobs and subsequent careers to the graduates.

[These points were listed in paragraph 3 of the Prime Minister's letter of 19 March and those present should be ready to respond.]

(v) The Government hopes that all the firms represented will agree to help. The stronger the response from industry, the greater will be the momentum of the change in higher education.

Annex 1.

10 DOWNING STREET

THE PRIME MINISTER

19 March, 1985

Dear Tom.

You will know of the concern voiced in many quarters and especially by business about the need to increase the output of graduate engineers and technologists. Attention has been drawn to this, in particular, by the Engineering Council and in the first report of the Committee on IT Skills Shortages under the chairmanship of John Butcher at the Department of Trade and Industry.

The Government has been considering these representations very carefully and you will have heard that we have announced today our intention to redeploy some resources for this purpose. I enclose a copy of the Department of Education and Science press notice. We envisage a special programme costing about £43 million over the three years 1985-86 to 1987-88. I am sure you agree that this programme will be worthwhile only if it receives sufficient industrial co-operation and support of the kind offered by the industrial members of John Butcher's committee. The first phase of the programme affecting student intakes in October 1985 will be launched soon - details should be announced next month. Future phases, and the success of the programme generally, will depend crucially on the willingness of industry to play an active part.

I would like to discuss this new initiative with you (and with the others on the enclosed list). I particularly wish to learn how far industry would contribute to such a programme by providing:

(i) more help with equipment;

(ii) more help with teaching staff - this is vitally important because it is doubtful whether our higher education institutions will be able to recruit qualified staff in sufficient numbers;

(iii) more placements for students on sandwich courses;

(iv) active help with the design of relevant courses;

(v) a readiness to offer worthwhile initial jobs and subsequent careers to the graduates.

I and my colleagues would also be very interested to hear your views on the following questions:

(a) which type of graduate is likely to be in greatest demand - for example, should we give priority to electronic engineering or to software engineering or aim for a broader spread? And is the demand principally for university graduates or does industry find graduates from the better polytechnics equally (or perhaps more) useful for many purposes?

(b) how should co-operation between industry and the chosen higher education institutions be organised? Should it be organised centrally, for example, through the IT Skills Agency, the

Scottish Development Agency, Government Departments and the UGC; or would it be better for each participating company to "adopt" one or more participating institutions?

(c) would industry be willing to sponsor more students? This is likely to be a very effective way of influencing the career choices of pupils at school and encouraging more young people to study maths, physics and technology.

Finally, if there were time, I should like to take the opportunity to seek your views on what more could be done - and I know a lot is being done already - to change the attitudes of parents, teachers and pupils towards careers in business.

I hope you will be able to meet me, Keith Joseph and other colleagues on Tuesday, 21 May at 1000 hrs in No.10 Downing Street. Would you please let my office know if you can come.

Yours ever

Margaret

The Lord Boardman MC TD DL

DISCUSSION

Objectives

The Prime Minister's objectives in the discussion should be to secure the greatest possible commitment to help from those present. She might refer first to the offers of help already received (letters from Sir William Barlow and Lord Weinstock) and call first on the ~~GEC representative (Mr Roberts)~~ to endorse the GEC approach.

NB: Start with GEC. Sir Robert Clayton Then Sir Francis Tombs

Next she might ask whether help will be forthcoming on all the points listed in the third paragraph of her letter of 19 March: see (iv) above.

Third she should get the meeting to agree to the recommended procedure for organising co-operation - see paragraph 6 of the main brief. Points to make:

(i) To ensure that universities and polytechnics really have firm additional support from employers we shall give them provisional allocations subject to their quickly producing evidence of such support.

(ii) Those in your head offices and operating companies who deal with universities and polytechnics can therefore expect urgent approaches in the near future. Could you please ensure that they are expecting this and will be helpful.

(iii.) Such local arrangements may not be enough: universities and polytechnics may not know where to turn, and you may be able to volunteer assistance that your regular contacts do not need. There is a need for a clearing house. The new IT Skills Agency under Sir Robert Clayton has agreed to organise the help in England and Wales. In Scotland the Scottish Development Agency will act as co-ordinators.

Is ITSA broadly enough based?

(iv) In any case, could all firms notify the names of their responsible executives to Mr Michael Bury at the CBI?

OTHER POINTS

Polytechnics

Too elitist?

It is agreed that most of the money should go to the best university departments in engineering and technology. Industrial leaders have given conflicting advice about the importance of including polytechnics. Points to make:

(i) Keith Joseph and Norman Tebbit have consulted ITSA about polytechnics. They have accepted advice that some polytechnics should be included (but only the best) and that the bulk of the extra money should go to the best university departments.

UGC & industry differences of view? Are UGC competent to judge? Are industry?

(ii) Whether in universities or in polytechnics only high quality courses should be financed - ie. those marked alpha by both industry and top academics.

(iii) Unduly specialised courses should not benefit from this extra money.

Are these points agreed?

Criticisms of Universities

Some industrialists present may voice criticisms of the willing ness of Universities to change to meet the needs of industry. The Prime Minister should not allow the meeting to be diverted from its immediate purpose - which is to secure agreement to extra help from industry in a joint endeavour. Instead she could, if necessary, invite Sir Keith Joseph to arrange a separate meeting later between the critics, the Chairman of the UGC and the representatives of the Universities.

Developments in the schools

It would be a waste of resources to expand the number of engineering and technology places in higher education and then find that the supply of qualified school leavers was insufficient to fill them. This is why the Government's policies set out in "Better Schools" are crucial to the success of the exercise in the longer term. [A brief on schools is at Annex 5 and Sir Keith Joseph should be asked to speak.]

Sponsorship

Bright pupils will not choose to apply for engineering and technology courses unless they believe that industry really wants them and will give them worthwhile careers. Sponsorship is one way of convincing more bright pupils that the effort of stuyding these subjects will pay off. Do the industrialists present agree? Will they sponsor more students?

Attitudes to industry (if time allows)

The last point mentioned in the Prime Minister's letter of 19 March is what could be done to change the attitudes of parents, teachers and pupils towards careers in business. The Prime Minister should make it clear that she knows that a great deal is being done already. If there were time, she might take the opportunity to get the agreement of those present to support one of the objectives of Industry Year 1986 which is to form a link between every secondary school in the country and at least one local firm.

SUMMING UP

The Prime Minister's aim will be to be able to say that those present fully supported the Government's action in allocating more money to the switch and committed their firms to help. In order to avoid generalised expressions of goodwill, she should indicate that No 10 will be issuing a Press Notice [the text is being cleared with No 10 Press Office] -

- Listing those present

- Registering their welcome of the Government's £43m programme

- Recording their agreement to provide extra help in cash and kind to universitiesand polytechnics receiving Government funds.

BRIEF FOR PRIME MINISTER'S MEETING WITH INDUSTRIALISTS
TUESDAY 21 MAY 1985

PURPOSE OF MEETING

1. The intention is to secure from the companies represented pledges of concrete support - in cash or in kind - for the Engineering and Technology Programme announced on March 19. If time permits, the meeting might also elicit their views on the other issues raised in the Prime Minister's letter of 19 March - Annex 1.

BACKGROUND

2. Government policy since 1979 has consistently been to encourage a movement in higher education towards science and technology in the interests of strengthening the industrial base. A number of initiatives have been launched and details are in Annex 2. Nevertheless many industrialists believe that the moves have not gone far enough and several recent reports have claimed that expansion of the new technologies will be constrained by shortages of highly skilled manpower. In February 1984 the Engineering Council advocated an increase in the resources provided for the education of engineers. In July 1984, the first report of Mr John Butcher's Committee on IT Skills Shortages concluded that, while precision was impossible, the employment market would for the forseeable future be able to absorb more IT skill manpower (including manpower in the fields of production engineering and computer aided manufacture).

3. Employers on the Butcher Committee recognised, in discussion, an increased obligation on them to assist the higher education system to respond. They recognised, in particular, that many industries in overseas competitor countries (United States, West Germany) played a much more supportive role than the average for the UK. They listed ways in which support could be given at all levels of education (Annex 3). To take matters forward, the IT Skills Agency was formed in October 1984 under the aegis of the CBI with a remit that included the co-ordination of support in this field for the education system. In Scotland a similar role is to be performed by the Scottish Development Agency.

4. Industrialists argued that the Government should inject more public money. In the 1985 Budget Speech the Chancellor of the Exchequer announced the Government's response - extra money for engineering and technology of £43m spread over 3 years. In announcing this Programme, the Government stressed the critical importance of industrial support. Evidence of specific industrial support will be a condition of inclusion in the second Phase of the Programme (further details of the Programme are at Annex 4).

GAINING INDUSTRIAL SUPPORT.

5. The Prime Minister's letter of invitation suggested possible ways in which industry might contribute (a number of these areas matched offers by the industrial members of the Butcher Committee). Discussion might centre on:-

i. more help with equipment - Teaching at higher education level in fields relevant to the new technologies requires equipment which is expensive and rapidly obsolete. Instruction in areas at the forefront of technology may call for the use of equipment only available in industrial firms. If firms wish teaching in higher education to be conducted with adequate up-to-date machinery, it will be necessary for donations or loans to be more widespread and more generous than they have been in the past. While there have undoubtedly been numerous examples of generosity by individual companies, in general H.E. institutions in the U.K. receive less support than comparable institutions in the United States. And several large U.S. IT companies are making substantial donations to U.K. institutions, knowing that this will help with subsequent staff recruitment and market penetration (IBM, Hewlett Packard).

ii. More help with teaching staff - Manpower with the skills necessary to teach effectively in new technological areas is scarce. H.E. institutions cannot compete with current market rates of pay. Any substantial increase in student numbers will call for greater support by industry in this area. This could take the form of industrial consultancies for university staff to increase their earnings (and hence attract recruitment into vital IT areas). Companies can also help by loaning staff to teach part-time, perhaps as visiting professors, thus sharing the skills they have. But staff made available in this way must be of top quality and be regularly available to undertake teaching programmes. There are already some examples of good practice: more are needed.

iii. More placements for students in sandwich courses - Employers regularly claim that students from sandwich courses gain valuable experience that increases their immediate utility. This belief is also reflected in recruitment practices. Such provision depends, however, on a ready supply of suitable placements. In recent years there has been great difficulty in finding enough suitable placements for students on such courses, perhaps because

of recession. While the difficulties are realised and there has recently been some small easement, problems still remain and can only be resolved by companies themselves. MSC grants are provided to employers hosting placements for engineering, technology and computer science students at first degree and higher diploma level. At a cost of £4m in 1985/86, these offer some offset to the cost of providing placements.

iv. Help with design of relevant courses - Complaints are regularly heard that courses in higher education are not suited to the needs of industry. There is scope for closer cooperation by industry, therefore, in developing suitable courses and in cooperating to ensure they remain up-to-date. Companies may themselves wish to offer assistance to local HE institutions rather than wait to be asked. They might also respond positively to invitations to sit on appropriate educational bodies (ie examining, validating etc).

v. Readiness to offer worthwhile initial jobs and subsequent careers to graduates - Much has been said about the need to attract more able students into science and engineering. Such students will be looking for signals from the employment market. Unsuitable first appointments will exacerbate staff turnover and send the wrong signals to younger students about to embark upon course selection. The more able will also want a career structure that will take them rapidly to the higher reaches of companies. Companies must show that all able entrants, including women, can really expect progression to the highest levels of companies. Without this, able pupils will continue to go into the professions and more effective ways of reaching influential management positions, notably accountancy and marketing.

vi. More sponsorship of students - Sponsorship by companies enables students to receive sums of up to £1,200 without maintenance grants being reduced. A recent U.K. survey showed that 75% of the students being sponsored were on engineering courses. Sponsorship helps companies, by enabling them to gain a first hand impression of potential employees, and students, by making more attractive courses in the subject areas most likely to lead to sponsorship. The Government has recently increased the sum
students may receive in this way to enable more positive signals to be given to prospective students about the attractiveness of engineering and technology courses. Industry can now respond by making sponsorship

widely available and publicising the efforts it is making.

6. HOW THIS HELP CAN BE MADE AVAILABLE.

Institutions already included in Phase 1 of the E & T Programme will be asked to report soon on what additional industrial assistance they have obtained. Ministers are determined that the E & T Programme should be backed by increased industrial contributions in cash and kind. In Phase 2, institutions will be given provisional allocations conditional upon demonstrating that they have obtained new industrial backing before government funding will be confirmed. Companies may wish to contact institutions directly, including those with whom such links already exist, or may, alternatively, wish to indicate to the IT Skills Agency their readiness to help. In Scotland the Scottish Development Agency will fulfil a comparable role and the SDA Chairman will have met Scottish industrialists a few days before the Prime Minister's meeting. Named contacts should be notified to Mr Michael Bury at the CBI.

7. OTHER ISSUES.

In her letter of 19 March the Prime Minister also asked:-

i. Which type of graduate is likely to be in greatest demand?

Advice to Government on where the greatest need will in future lie tends to vary quite widely. IT manufacturers (who will be substantially represented at the meeting) normally place the emphasis on electronics engineering though certain types of advanced physics can provide the research base needed to keep at the forefront of technology. Some significant voices advocate general engineering courses (eg at Cambridge) of high quality with specialisation at a late stage (and subsequently at postgraduate level). An increasing body of opinion argues, however, that the future need will be for "applications people": computer scientists and engineers able to spread the use of technology in the user industries and that this will be the preponderent need by the end of the decade. The Government has already recognised the substantial support for students from the better polytechnics, who may well be particularly closely industrially orientated. But those present may have further views on these questions to offer.

ii. How to achieve cooperation between industry and higher education institutions

Proposals for how this should be handled for the programme are described above (para 6). More widely, and for the future, there are questions of local and regional support to address. Sir Robert Clayton, as Chairman of ITSA, may wish to contribute on the approach they are adopting and others present may well have views about useful mechanisms to be pursued.

8. CHANGING ATTITUDES IN THE SCHOOLS.

The Government has recognised that securing more good quality graduates in relevant subjects from the higher education system must depend crucially upon suitable candidates coming forward from schools. A note on action in the schools is at Annex 5.

9. POINTS LIKELY TO BE RAISED.

Some replies to the Prime Minister's letter have raised points that may well be aired in discussion at the meeting (particulary that from Lord Weinstock). A note on the points in that letter, and others likely to arise, is at Annex 6.

ANNEX 4

THE ENGINEERING AND TECHNOLOGY PROGRAMME

1. The programme was announced on March 19. It is costed at £43m over three years, 1985-8. The costs are shared between DES, Departments of Trade and Industry, Employment and Energy and the Scottish and Welsh Offices. The objective is for more high quality students in higher education to study engineering and technology, at both undergraduate and postgraduate level.

Phasing

2. The programme money is being committed in two phases: £14m in Phase I and £29m in Phase II. Given the urgency of increasing graduate output in these subjects it was agreed that departments which could admit additional students without needing to erect new buildings, should be allowed to bid competitively for funds to admit students from October 1985. As a result, 475 undergraduates and 104 postgraduate places at a total of 20 universities have been created for take-up this autumn. Places under Phase II will become available from 1986.

Institutional mix.

3. Phase I provision has been located solely in universities and this was in line with advice the Government initially received from industry (and especially the Engineering Council) that the emphasis should be on high quality graduates and therefore on universities. This advice has recently been modified: a number of industrialists have now commented on the value of the graduates from the best polytechnic engineering departments. At a meeting with the Secretary of State for Education and Science and PUSS for Industry (Mr Butcher) on 7 May, ITSA advised that there should be some modest provision in this programme for polytechnics and other non-UGC institutions. The Secretary of State is accordingly recommending to his colleagues that a sum of money, still to be determined, should be reserved for this purpose from remaining funds.

Mode of allocation.

4. Allocations in Phase I were made (and in Phase II will be made) on the basis of cost-competitive bids from institutions. Advice is being taken from the UGC (on academic quality) and industrialists, under the aegis of ITSA (on usefulness to industry). The Engineering Council will also be tendering relevant advice. The National Advisory Body on Public Sector Higher Education will be advising on the academic quality of polytechnic bids: and SERC on postgraduate courses. Provisional decisions on Phase II allocations will probably be announced in mid-late June.

Unit Costs.

5. Unit costs in Phase I were well below normal because competitive bidding enabled marginal capacity to be exploited. Options for Phase II would include large expansion in a few high quality institutions but such a course would carry relatively higher unit costs. Allocations under Phase II will also need to take account of bids from non-UGC institutions (Cranfield, Open University, Salford and polytechnics).

Industrial support.

6. The Government will be expecting industry to contribute concrete support - in cash or kind - to those institutions allocated funds under this programme. It will be a strict condition of confirmation of government funding in Phase II that provisionally selected institutions should be able to demonstrate that such industrial support has been forthcoming. The timetable of Phase I did not allow for conditional allocations of this kind, but institutions will be required shortly to inform the government of what industrial support they have obtained.

Graduate output.

7. It is expected that, on certain assumptions about Phase II, the programme will by 1990 have produced a total additional output of engineering and technology (including computing science) graduates of about 3,500 of whom up to 780 will have been on postgraduate courses. Annual output of first degree graduates in Engineering and Technology is now projected to increase from 15,900 in 1985-6 to 18,400 in 1989-90: slightly more than half this increase of 2,500 would be attributable to the Engineering and Technology programme. These figures are however provisional and depend on decisions yet to be taken on the remainder of the Programme.

ANNEX 6

POINTS INDUSTRIALISTS MAY RAISE

There are a number of other points which industrialists may raise. Some have been mentioned by Lord Weinstock in his letter and accompanying note of April 19 to the Prime Minister (Attached).

i. Too few pupils are mastering mathematics and science in our primary and secondary schools. These subjects should be taught with a more practical bent. There are not enough effective teachers in this area (particularly of mathematics).

Response: There are two aspects to this: the school curriculum and the training of teachers. We are dealing with both. On the curriculum, our policies are designed to create a stronger emphasis on mathematics and science in the schools and to increase the practical dimension of what is taught. [For example: the new "AS" level courses starting in 1987 will encourage those taking arts A-levels to continue studying maths and science: the new GSCE courses starting in 1986 will have a significant practical content]. On training of teachers, our policies are designed to improve the supply of effective maths and science teachers. We are increasing the number of initial teacher training places in these subjects and we are considering ways of attracting greater numbers of able young people into these courses, in recognition of recruitment difficulties currently being experienced. We are subjecting the training courses themselves to more rigorous "quality control": and we are giving priority to these subjects in allocating grants for in-service training.

Get KJ to deal.

ii. The Engineering and Technology Programme should include retraining of existing engineers.

Response Agree that professional updating will be crucially important in fast-changing technologies. This programme concentrates on producing top quality new engineers and technologists. Companies themselves must shoulder a major responsibility for retraining and updating of skills. Evidence [in the MSC/NEDC report on "Competition and Competence"] suggests that companies in U.S., West Germany and Japan more readily accept this responsibility.

So far as Government is concerned, there is the work of the MSC in this area, DES's "PICKUP" programme and the UGC and the NAB have set up a joint Standing Committee on "Continuing Education". This is examining the scope for a larger role for universities and polytechnics in the professional updating of engineers and technologists.

iii. Large companies have to carry the training burden for the whole of the industry.

Response: Some firms say they train people, only to have them "poached" by others. John Butcher's Committee which looked at this, concluded that the poaching rate was not as high as is sometimes claimed [They estimated a maximum turnover of 20% of graduate recruits within two years of starting work]. In any case some industrialists have proposals about how the problem might be dealt with. ITSA could be a useful forum for consideration of these. But this is a matter for self-regulation within the industry: not for Government. [Note: Don't let general arguments obscure the need to support this exceptional exercise sparked by employers on Butcher].

iv. Support for recommendation of House of Lords Select Committee on Science and Technology for a new statutory Education and Training Board.

Response: The Government is due to respond to this report in July. It is difficult to say much before then, although the Government would probably need very persuasive evidence to be convinced of the need for another statutory body in the educational and training field (which would be a new quango in all but name).

v. Too many government departments and institutions are involved: the new programme needs single-minded direction.

Response: The programme is being given clear direction: the DES is the lead department, but other important interests have to be consulted and involved. This is essential to success.

vi. More generous tax concessions on donations of equipment to educational establishments - such as they have in the U.S. would encourage industrialists to do a great deal more.

Response: (The US arrangements allow companies to set against corporation tax not simply the cost of equipment given to universities, etc but also to claim a further deduction in respect of profit forgone through not selling the equipment to a customer. It is hard to see much logic in this further inflation of the tax relief, which may not survive the proposed simplification of the US tax system. Hewlett-Packard (a US controlled company represented at today's meeting by Mr D A Baldwin) have been urging the US arrangements on UK Government Departments, without success; the subject is not mentioned in Mr Baldwin's letter of 15 May to the Prime Minister.)

Response: Full relief against corporation tax is generally allowed where companies give equipment to educational institutions. Equally they get full relief on cash gifts made under covenants to suitable educational institutions, and the same applies when they sponsor students. These reliefs are sensible and wideranging, and I hope companies will make more use of them than hitherto.

vii. There should be earmarking of funds for engineering departments in higher education institutions.

Response: The problem is better understood than it was 4 or 5 years ago, and the Government will be watching it carefully. The UGC have already expressed to universities their dissatisfaction with the level of funding for engineering departments and expect the position to improve. In the public sector the case for improving the relative weighting factor for engineering courses is under consideration. We are determined that the Engineering and Technology programme will mean more good graduates in the relevant disciplines, and we are satisfied we can achieve this without earmarking funds for particular purposes in particular institutions - a course which would be fraught with difficulty for the Government's relations with those institutions.

viii. Present shift towards science and technology in higher education is not enough

Response: The Government is continuing to advocate further moves towards science and technology within universities and the public sector and we will be stressing this in our forthcoming Green Paper on Higher Education. Such

changes cannot, however, be made speedly without substantial additional resources: engineering provision is considerably more expensive than arts provision. And remember, there is no point in providing places in higher education unless sufficient school leavers come forward with A levels in Maths and Physics.

vi. More generous tax concessions on donations of equipment to educational establishments - such as they have in the U.S.- would encourage industrialists to do a great deal more.

Response:

There are, of course, provisions in UK tax law for relief on business donations made for technical education, as well for the sponsorship of students. Remember, tax systems must be looked at in the round: it is very misleading to cite a particular tax relief in another country, in isolation from its overall context.

vii. There should be earmarking of funds for engineering departments in higher education institutions.

Response:

The UGC have already expressed to universities their dissatisfaction with the level of funding for engineering departments and expect the position to improve. In the public sector the case for improving the relative weighting factor for engineering courses is under consideration. We have explicitly rejected the suggestion of earmarking at this stage, not least on the grounds that it would have unacceptable institutional side effects and the problem can be tackled in other ways.

viii. Present shift towards science and technology in higher education is not enough.

Response:

The Government is continuing to advocate further moves towards science and technology within universities and the public sector and we will be stressing this in our forthcoming Green Paper on Higher Education. Such changes cannot, however, be made speedily without substantial additional resources: engineering provision is considerably more expensive than arts provision. And remember, there is no point in providing places in higher education unless sufficient school leavers come forward with A levels in Maths and Physics.

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(e) A readiness to offer worthwhile initial jobs and subsequent careers to the graduates.

[These points were listed in paragraph 3 of the Prime Minister's letter of 19 March and those present should be ready to respond.]

(v) The Government hopes that all the firms represented will agree to help. ~~If the response from industry is strong, the change in higher education will gather momentum.~~

[~~If the response is weak, the Government will conclude that "the switch" does not deserve the priority that the Engineering Council and John Butcher's Committee recommended for it.~~]

The stronger the response from industry, the greater will be the momentum of the change in higher education.

RB : omit !

S

[redacted]R AUSTIN PEARCE
British Aerospace plc

MR. M. BETT
British Telecom plc

MR. ROBERT THORNTON
Debenhams plc

MR. J.D. ALUN-JONES
Ferranti plc

MR. S. TOY
Ford Motor Co. Ltd.

MR. R.J. CLAYTON
GEC

MR. DEREK ROBERTS
GEC

SIR AUSTIN BIDE
Glaxo Group Ltd.

MR. D.A. BALDWIN
Hewlett-Packard Ltd.

SIR EDWIN NIXON
IBM(UK) Holdings Ltd.

MR. J.H. HARVEY-JONES
Imperial Chemical Industries plc

MR. P.A.B. HUGHES
Logica Holdings plc

MR. R.G.C. MESSERVY
Lucas Industries plc

THE VISCOUNT SANDON
National Westminster Bank plc

SIR JOHN CLARK
The Plessey Company plc

SIR ERNEST HARRISON
Racal Electronics plc

MR. H. ORR-EWING
Rank Xerox Ltd.

SIR ROY SISSON
Smiths Industries plc

SIR KENNETH CORFIELD
STC PLC

MR. P. SWINSTEAD
Systems Designers Ltd.

Mr. P. LAISTER
Thorn EMI plc

MR. R.E. UTIGER
TI Group plc

SIR TERENCE BECKETT
CBI

SIR ROBERT CLAYTON
Information Technology Skills Agency

SIR FRANCIS TOMBS
Rothschilds Rolls Royce

MR. ROBIN DUTHIE
Scottish Development Agency

Mr. J.S. WHYTE
National Electronics Council

RT. HON. SIR KEITH JOSEPH, MP

RT. HON. NORMAN TEBBIT, MP

RT. HON. TOM KING, MP

RT. HON. LORD YOUNG OF GRAFFHAM

RT. HON. GEORGE YOUNGER, MP

MR. JOHN BUTCHER, MP

SIR ROBIN NICHOLSON

MR. P.[illegible]. WARRY

MR. J. WIGGINS

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GOVERNMENT INITIATIVES TO INCREASE THE SUPPLY OF SKILLED MANPOWER

1. The Engineering and Technology Programme is the most recent of a series of initiatives designed to increase the output of engineers and technologists. Other significant initiatives are:-

i. Information Technology in Higher Education. Announced in December 1982 by the Secretary of State for Education and Science, this programme provides £38m between 1983 and 1986 for the creation of **an additional 5000 places** in electronic engineering and computer science at higher diploma, degree and postgraduate level in polytechnics and universities.

ii. The National Advisory Board for Local Authority Higher Education (NAB) Programme Planning Exercise. The Nab's programme planning exercise for 1984-85, and its "roll forward" for 1985-6 already make provision for a substantial shift of resources into engineering and other vocational provision in polytechnics and institutes of higher education. These plans allow for intakes for full-time and sandwich engineering courses to rise by 15% between 1982-83 and 1984-5; in mathematics and computing by 50% and in science by 7%, again between 1982-83 and 1984-5.

iii. The Universities have already indicated in response to a UGC request that, at their new levels of staffing and funding, they will seek to increase student intakes by some 3000 in both 1984/85 and 1985/86 and that this increase will be composed mainly of science and technology students.

2. At the non-advanced further education level, the Government has allocated, via the Education Support Grant system, £13m to LEAs in 1985-6 in order to help equip further education colleges to ensure that students in vocational subjects receive an education which takes account of the industrial and commercial applications of IT. Further funding will be available in 1986/87 and subsequent years.

3. Specific Government initiatives should enhance secondary pupils' interest in and understanding of the new technologies. The Microelectronics Education Programme run by the DES, and the various Micros in School Schemes run by the DTI have together raised the profile of the new technologies in our schools, through coherent programmes of teacher training, material development, information dissemination and half price hardware provision.

EXTRACTED FROM THE FIRST REPORT
OF THE IT SKILLS SHORTAGES COMMITTEE

Section 6 — A New Partnership Between Industry and the Education System

37 Representatives of industry have presented an imaginative set of proposals aimed at overcoming some of the constraints noted in the previous Section of this Report and at encouraging a "partnership for change" to enable the education system to respond more effectively to industry's changing requirements.

38 Industry is ready to undertake the following initiatives:

i Higher Education

- Supply key executives as Visiting Professors and help with the supply of lecturers.

- provide consultancy and employment opportunities for academics to enhance dialogue at local level and increase the earnings of key individuals.

- provide equipment on loan or as gifts and give access to very expensive leading edge equipment which universities and polytechnics could not possess.

- commission universities and polytechnics to supply contract education, eg conversion courses, development courses, updating programmes etc.

- make key people available to help coordinate activities to tackle shortages.

- enter into training partnerships with academic bodies.

- establish "IT Training Companies" with equity participation by companies, academic institutions and Government. In this context the Committee welcomed the proposals put forward by DES to enable polytechnics to trade on their own account.

- increase sponsorship of students on relevant undergraduate and post-graduate courses.

- provide greater opportunities for students to obtain industrial experience within academic programmes.

- encourage greater interchange of views between industry and education.

ii Schools

- offer staff to teach part-time and to relate school work to industry.

- help train teachers by visits, secondments, exchanges and courses.

- provide equipment on loan or as gifts.

- Participate actively in programmes designed to promote vocational studies.

- Help schools to appreciate the vocational needs of children and how to respond to them.

Points for Action

39 Preliminary discussions between Government and industry have identified the following areas of agreement:

i The UGC and NAB will identify their teaching needs so that industry can gauge what assistance can be provided.

ii Institutions will be invited to identify their needs for equipment.

iii "Good practice" in giving students relevant industrial experience will be publicised.

iv A more formal system for regular teacher visits and secondments to industry will be examined.

40 Action along these lines, taken together with the other proposals submitted by industry, creates **a new partnership between industry and higher education** which should enable changing national skill requirements to be met in a more relevant, flexible and cost-effective way. The Government will vigorously pursue all these ideas including novel concepts such as the IT training companies. The Committee's Second report will review progress made in these areas.

ACTION IN THE SCHOOLS

Annex 5

1. The usual qualifications for engineering and technology degree courses are maths and physics A levels. It would be a waste of many more undergraduate places if the supply of school leavers with these qualifications does not match. Hence the importance of the Government's policies in Schools.

2. As well as the formal qualifications, positive attitudes to engineering and technology need to be developed in school. The Government's policies are intended to widen the base of mathematics and science in the schools. The introduction of AS levels (first courses in 1987) will encourage those taking arts A-levels to continue the study of mathematics or science. The policies for the curriculum set out recently in 'Better Schools' and in 'Science 5-16: a statement of policy' are designed to ensure that all pupils continue the study of a broad and balanced science course to age 16. This is at present true of too few pupils, especially girls, and options post-16 are correspondingly foreclosed.

3. More widely, it is Government policy that subjects should be taught so as to bring out their relevance for adult life. For all pupils, the practical dimension to learning should be reflected in the content and teaching of subjects (as is now happening increasingly, for example, in mathematics in the wake of the Cockcroft Report) as well as in the balance between subjects. Thus more pupils of all abilities should study craft, design and technology to age 16. The national criteria for the new GCSE examinations (first courses 1986) stress practical skills, reasoning and the application of knowledge in all subjects. It is an important part of Government policy that these principles should equally inform the curriculum in primary schools, where the foundations for later attitudes and enthusiasms are laid.

4. Under the Technical and Vocational Education Initiative pilot projects will soon be running in most local education authorities. These projects are designed to test ways of organising and managing a variety of new approaches to the provision of full-time general, technical, vocational and pre-vocational courses for young people 14-18. The Initiative is being administered by the MSC and will contribute to the Government's aims as set out in the recent White Paper "Better Schools".

THE GENERAL ELECTRIC COMPANY, plc.
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01-493 8484

CF

19th April, 1985

(1714

Dear Margaret,

Thank you for your letter of 19th March, 1985 about graduate engineers and technologists.

GEC will, of course, do what it can to help, and I attach a note on the questions in your letter, with some facts about what we are already doing. There are four points which deserve special attention:-

i) we are short not just of new graduates. The pace of technical change is now such that regular re-training is needed. It is therefore important that a new programme should in some way take account of the need to update and re-train at least some of our existing engineers - people who have already proved they can get things done;

ii) some people learn their engineering as much by action as in the classroom. Many educationalists still do not understand the importance of activity-related

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learning at all levels (primary, secondary and degree) in terms of students' career prospects and the economy;

iii) many technologists and technicians don't in fact work in the engineering industry at all; over fifty per cent of them are currently employed outside the engineering industry. The Engineering Industry Training Board cannot deal with the problems involved, because while GEC, for instance, is in the Board's scope, many employers of engineers and technologists (such as ICI, BP, BT and Marks & Spencer) are not. Through the Information Technology Skills Agency, employers are looking for solutions in the creative sense and to practical problems (e.g. the question of some sort of rough and ready code of conduct about poaching while we build up resources). But they need Government support. The recommendation by the House of Lords Science and Technology Committee for a new statutory Education and Training Board would be a good starting point provided it is confined to scarce technological skills;

iv) difficulty and confusion is caused by the unco-ordinated involvement of several Government departments, national bodies such as the UGC,

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educational institutions and local authorities, all of which enjoy a large degree of independence and have vested interests to protect. The new programme needs single-minded direction by a determined Government.

Sir Robert Clayton will attend the meeting on 21st May, so you probably won't need me as well. But may I suggest that Derek Roberts, our Director of Research, attends because he has a particular expertise in this field and will look after the follow up in GEC.

Yours,

Arnold

Lord Weinstock

The Rt. Hon. Mrs. Margaret Thatcher, MP,
10, Downing Street,
LONDON, S.W.1.

Enc.

ANNEX

PROGRAMME TO INCREASE GRADUATE ENGINEERS AND TECHNOLOGISTS

(Prime Minister's Letter of 19th March 1985)

(1) Many of the fundamental problems regarding business skills and employment prospects are referred to in the recently published White Paper, but the context of the overall problem is relevant to GEC's specific comments on the Prime Minister's questions.

The Problem

(2) Too few young people master mathematics and science in our primary and secondary schools. It follows that the pool available to train as engineers and technologists at university and the polytechnics is too small to start with; this will be aggravated by the fall of about one third in the number of youngsters in their late 'teens between 1984 and 1990.

(3) Simply determining new curricula in the schools is no solution. There is a serious shortage of effective teachers, particularly in mathematics. And we do not make the best of what we have because many educationalists do not seem to understand that young people learn in different ways; conventional methods of teaching do not suit everyone. In GEC's experience, some youngsters respond

much better to practical than to formal learning.

(4) Young people who, for one reason or another, have rejected conventional education, can learn effectively through activity-based training. The better YTS programmes have enabled the young to understand the real life relevance of subjects like mathematics and physics. The Technical Vocational Education Initiative, the new Certificate of Pre-Vocational Education and the Scottish Education System also encompass such learning styles. Activity-based training should be considered more throughout primary and secondary education in the UK.

(5) Of the people who do come through as graduate engineers and technologists, far too many never enter engineering industry or leave it. Some join other manufacturing industry (e.g. ICI and BP) but many go into non-manufacturing companies such as BT and Marks & Spencer (who now recruits engineers but does not train them) and professions such as accountancy and banking. Overall over 50% of technologists and technicians are currently employed outside the engineering industry, which cannot make sense.

(6) We have also to recognise that the pace of technical change is now so great that some re-training or extension of expertise is needed for our existing graduate engineers and technologists, possibly as often as every 10 years. Without this we shall not make full use of them throughout their working lives. The UK is slipping behind its competitors in this respect as well as in the provision of

new young graduates. It is very important that the Government's new programme should take account of this need. Clearly employers have a responsibility but it should be shared between them and higher education institutions with the Government acting as a catalyst to get things moving, especially in such fields as distance learning and Tutorial Video Instruction programmes.

Industrial Contribution

(7) The Prime Minister asks what contribution industry can make. GEC will, of course, do what it can to help. The answers to her specific questions (i-v on page 2 of her letter), that is the details of equipment, teaching staff, design of courses and career prospects, can be worked out by her officials and GEC managers. A lot is already done. For example, 8 of our staff hold positions as visiting university professors; our central research laboratories teach several under-graduate courses; and the students involved have access to our specialist equipment. And, the technological training carried out in GEC during a 12 month period, amounts to;

New graduates	1,500
Student apprentices	1,800
Technician apprentices	3,000
Craft apprentices	2,500
Mature technicians and technologists	11,000

YTS youngsters, customers
employees and overseas
employers' staff 8,000

(8) In assessing the contribution industry can make, it is necessary to distinguish between "industry" and particular employers, because a relatively small number of high technology companies are in fact doing the larger part of the UK's high technology training. Most UK companies either cannot or will not train for technological skills and are poaching skilled and experienced people from those who carry the burden of training them. But this minority of companies cannot be expected to cope with this indefinitely and, anyway, they cannot do enough unaided. The costs of training technologists are considerable, and if these businesses are to carry out more training and sponsorship to help overcome a broad national problem, they need financial help.

(9) Turning to a on page 2 of the Prime Minister's letter, the key subjects for expansion at universities and polytechnics include electronics engineering, computer science and physics; GEC managers can identify appropriate centres of excellence for officials. It may be necessary to introduce more flexible entry qualifications for science and engineering courses at universities, and the better polytechnics must not be forgotten when extra resources are allocated. Incidentally, the progress of the Open Tech started by one of the Prime Minister's former colleagues has been disappointingly slow.

Organisation

(10) There are 2 key points on b and c on page 2 of the Prime Minister's letter.

(11) Because the Engineering Industry Training Board functions in a sectorial manner (GEC is in its scope but, for example, the other companies mentioned at para. 5 above are not), it cannot be effective either creatively or in dealing with practical problems. Many employers of engineers and technologists do not face the cost pressures applying to engineering industry who operate extensively in export markets and there is a need for a rough and ready code of conduct about poaching in order to minimise any inflationary spiral while we are building up our resources of these people.

(12) Through the recently formed Information Technology Skills Agency, high technology employers are now trying to identify solutions. But they need Government support. Perhaps the recommendation made by the House of Lords Science and Technology Committee for the setting up of a statutory scarce technological skills education and training board offers a constructive starting point and a way out of the problem with the EITB.

(13) Still more difficulties and confusion are caused by the unco-ordinated involvement of several Government departments and bodies in the scarce technological skills area, including the Departments of Education & Science,

Employment, Trade & Industry, the MSC and the EITB, besides such institutions as the UGC, the examination boards, the universities, polytechnics and Local Education Authorities. All enjoy a large degree of independence, have axes to grind and interests to protect. This confusion will continue to restrict the process of change and to have an adverse affect on our industrial advance, unless the new initiatives are directed in a single-minded way by a determined Government.

20 MAY 1985