

JH 670



PRIME MINISTER

FUTURE ROLE OF THE BTG

I have now had time to consider the points you made to me about the future role of the BTG in our discussion on 21 April.

2 I attach the note you asked for outlining the proposed role and financial regime which I have agreed with Treasury and other Ministerial colleagues.

Need for BTG

3 You will remember that in my minute of 28 March I put forward my plans for the future of the BTG:

- to separate out those old investments of the past which still remained in the NEB's portfolio and have them managed and disposed of as a separate exercise;
- with the increase in the availability of venture capital to shift the emphasis of the mainstream BTG activities away from investment towards the earlier stages of technology transfer;
- to encourage competition throughout the technology

agreed . 2
Prime Minister

I will resubmit this
to you with Dr Nicholson's
views.

Thank you
MT

MS 9/5



transfer process by ending the BTG's right of first refusal;

- to provide for the possibility of the BTG performing other tasks. I mentioned a regional role in the English Assisted Areas but this would clearly depend on the outcome of MISC 14.

4 You welcomed the encouragement of greater competition in the process of technology transfer and wondered whether the growth of venture capital at one end of the spectrum and the freedom for research workers to exploit their own inventions at the other did not dispense with the need for a BTG altogether.

? 5 Though I started, like you, as a profound sceptic I have been forced to the conclusion that a body is still needed in the public sector to deal with the difficult and staff intensive task of identifying ideas, occasionally providing pre-development finance and of patenting and licensing those which have promise of commercial success. There are many recent reports to vouch for the difficulty in achieving technology transfer, including from ACARD, NEDC and Parliamentary Committees (the most recent from the House of Lords Science and Technology Committee which we have yet to answer). Venture capital is not the problem; it is the hard slog at the earlier stage which is the main deficiency. A timescale of 5 to 10 years from research to market place is normal, rather than exceptional, as the cases described in the attached note illustrate. Since we spend about £3.5 billion of



taxpayers' money on R&D, I believe that a further modest investment to help transfer the benefits of this research to industry is worthwhile. Indeed the BTG has been able to finance an investment of about £15 million a year out of its revenue. Were it not for the imminent decline of this revenue (as the Cephalosporin patents run out) privatisation might have been possible now.

6 Over the next 5 or so years, however, I envisage the role of the BTG progressively reducing as the venture capital market takes an earlier interest in potential projects involving new technology. The market will of course tend to pick out the most promising projects; it would be quite wrong for us to discourage this. As we get the fiscal environment right (and in my view we still need to do more), the venture capital firms will increasingly fill the gap. But we are not there yet. We want to encourage closer links between industrial firms and academic research work. This is happening already - the BTG has no rights, for example, over UGC funded research - but it is still the exception to find research workers willing or able to tackle the business of exploitation themselves. This is why the Research Councils and Universities see a continuing need for the BTG. I am sure this need will decline as direct contacts improve and I mentioned some of the ideas I had for strengthening these links in my minute of 28 March. A similar situation exists in the Ministry of Defence Research Establishments and indeed even in my own Department's Research Establishments, though there have been improvements in both.



7 The increase in competition should therefore help create alternatives to the BTG. It should also transform the motivation of the BTG itself. BTG staff will have to prove themselves. If they succeed, we can privatise a large part of their activities. If they do not it will be because the private sector will be filling the gap and we can safely wind up the BTG.

8 When we met to discuss this, you asked in particular whether there was not an overlap between what I was proposing for the BTG and the activities of institutions such as FFI and ICFC. It so happens that Mr Tindale, the Deputy Chairman of FFI, is a Board member of BTG - and has been a Board member of NRDC for 9 years. He is a strong supporter of the BTG's patenting and licensing work. You may be interested to see his views in a recent letter which I attach.

Size of the Organisation

9 If you agree with my view that there is a continuing need for an organisation whose role can either be expected to contract over the years or if not should be a candidate for privatisation, it is right to consider what size of staff is appropriate for the tasks involved.

10 Before the NEB and the NRDC were merged, they had a combined staff of 325; the NEB had 90 staff and the NRDC 235. Since the merger there has been a 25% cut in staff, with recent savings when the organisation moved into a single building. Of the 240 staff presently employed, about 150 are engaged on technology



transfer activities. Of the remainder some 30 are managing the existing investments which I have proposed should be handled separately; 25 are working in the regions; 7 on small firms schemes and the remainder on new investments - a role which I see declining almost to extinction - and administration and other central services. Given that the BTG receives over 2,000 new inventions each year from a variety of sources and has more than 900 projects on hand I do not think that the present figure of about 150 is so unreasonable as to be condemned out of hand. Some work might be contracted out to reduce this requirement.

How many are patented?

11 My approach would be to make it clear to a new Chairman that his first task would be to take stock of the organisation and to decide what size staff is appropriate for the tasks that are now to be given to it. The financial arrangements which I have agreed with the Treasury will enable me to monitor the level of administration expenses and will contain an in-built incentive for the organisation to keep their costs to a minimum.

12 If you can agree with the kind of role I have outlined for the BTG I would propose to make a very early announcement of our intentions, which will help to dispel the uncertainty which has now been hanging over the BTG for some months. During my recent regional visits, I have been pressed by both businessmen and academics with the need to clarify the BTG's future. It would be



highly desirable to announce the name of the new Chairman at the same time. In my earlier submission I suggested Dr Jack Birks, who I know would be very supportive of the approach I have suggested. Another, much younger, candidate is one of the present BTG Board members - Dennis Stevenson - who impressed me very strongly when I sounded out the Board on my future intentions. He is very lively, keen and knowledgeable in the technology transfer field, and would I believe, be a very effective manager - though I have not yet approached him about the Chairmanship. If you are attracted by the idea I will make the necessary enquiries as a matter of urgency.

13 I am sending a copy of this minute to Sir Robert Armstrong.

Catherine Varley

(approved by the Secretary of State and signed in his absence) P J
9 May 1983

Department of Industry
Ashdown House
123 Victoria Street
LONDON
SW1E 6RB



JF3434

ANNEX A

BTG

Role: The role of the BTG will be:-

- 1 To maintain contact with research in Universities and other publicly funded bodies in order to be aware of work which offers commercially exploitable opportunities.
- 2 To provide a patent service for publicly funded research (and other inventors) which ensures that appropriate protection is provided so as to enable British industry to take maximum advantage of the research.
- 3 In cases where the appropriate research results are either not immediately patentable or otherwise require further development before they can be exploited by British industry, to provide funding for such development work.
- 4 To maintain contact with industrial companies who may be interested in exploiting the results of particular pieces of research through taking a license or entering into some form of joint venture arrangement to exploit the work.
- 5 Similarly, to maintain contact with other sources of venture capital with a view to interesting them in financing technology transfer where necessary on a joint basis.



- 6 To undertake such other activities as the Government may from time to time ask them to carry out; eg regional role, small firms role, awards to academic establishments sharing outstanding technology transfer activities.

In none of these cases would the BTG have an exclusive right to operate. The range of activities would depend on the quality of the service provided by the BTG and the willingness of research workers, industrialists and venture capitalists to use the BTG or enter into joint arrangements with it.

Financial Regime

The BTG will be required to draw up a five year plan of its technology transfer activities, the funding it will require and the income it expects to earn from its licenses and its investments. Once the plan is agreed with the Treasury, the net funding requirement will be provided within PES in annual tranches (rather than provided as an initial lump sum) but the BTG will have to aim to become self supporting over a specified period.

The BTG will update and agree the five year plan annually with the Department of Industry to ensure that the priorities of the BTG are maintained in line with those the Government determines for the Department. Beyond this the judgements on individual cases will be entirely the responsibility of the Board of the BTG, subject only to such limits to the delegated powers as are laid down in the statutory guidelines, but even in cases requiring the consent of the Secretary of State the Department will not 'second guess' the judgement of the Board or the arrangements entered into with private sector partners.



The agreed PES annual tranches will only be varied in so far as the Government invites the BTG to undertake additional activities, under (6) above, for which additional funds may be required. These will be funded, and accounted for, separately from the technology transfer activities.

Monopoly Rights

The BTG will have no monopoly rights over publicly funded research. In order to define the nature of the services it will offer and the terms on which it will do so, the BTG will enter into general agreements with Research Councils, and other funding agencies eg Ministry of Defence. Arrangements will also need to be made to ensure a return to the Exchequer when publicly funded research is exploited directly with industry or private sector source of venture capital and also to ensure that British firms have the first chance to take up new ideas which have been developed at the taxpayers' expense.

Regional and other non-commercial activities

These tasks will only be undertaken by the BTG at the express invitation of the Government and only if the Board of the BTG is satisfied that they can be carried out satisfactorily alongside the technology transfer role.



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ANNEX B

Nuclear Magnetic Resonance

This is a technique for imaging biological tissue, including the inside of a human body. A number of Universities in this country took up research which had been started in the US (particularly Nottingham, Aberdeen and Oxford) and the NRDC first became involved in 1973. Its first patent application was in April 1974. Since then further extensive work has been undertaken in a number of Universities and the NRDC has been able to draw the various threads together and currently holds a large portfolio of patents covering some thirteen separate inventions. The BTG has licensed a number of companies to develop commercial NMR imaging systems using one or more of these patented inventions. This includes both large companies (GEC for example) and small ones (one of the researchers at Aberdeen has set up his own company with venture capital support). Commercial equipment is only beginning to become available now almost 10 years after the NRDC first became involved.

Perbury - Continuously Variable Transmission System

This is a private invention made by two individuals in this country in the 1950s who proved that this new form of transmission system would work in a car. The inventors tried unsuccessfully to interest vehicle manufacturers over a long period and eventually turned to the NRDC who recognised the fuel saving characteristics of the invention and in the mid-1960s agreed to fund further research. With the further patents and know-how which this generated, the NRDC tried to interest companies but without success until after the oil price increase when BL began to show interest. BL now have a licence to the technology and have incorporated the transmission system in a Leyland Bus. They have no plans to incorporate the system in their other vehicles but both Ford UK and Volvo have been



discussing with the BTG the prospect of licensing the technology for application in cars. A further licence is likely to be granted shortly to Ford UK although BL have been trying to block the arrangement. Meanwhile another application of the technology has been developed - that of a constant speed alternator drive in the Harrier. This has already generated an income to the BTG of £300,000.

Alkali Resistant Glass-Fibre

In 1967 a research worker at the Department of Environment's Building Research Establishment demonstrated that a glass composition could be produced that was resistant to alkali attack and capable of being made in the form of a fibre. This had considerable application to the problem of reinforcing cement (which is slightly alkaline) with glass fibre. BRE offered the invention to NRDC who were convinced that it was the sort of development in which Pilkingtons should be interested. The company declined for more than 2 years to take any interest on the basis that no significant glass innovation could take place outside the industry. There was interest in the invention from overseas companies but NRDC persisted with Pilkingtons and they were eventually persuaded. Pilkingtons then committed considerable resources to the development and the NRDC also invested £ $\frac{3}{4}$ million in a joint venture development programme which resulted in the launch of Cem-Fil, a process which Pilkingtons have also now licensed in Japan and the USA.

Unimation

NRDC established contacts with this US company in the early 1960s when it was trying to help with a licensing arrangement between it and a British company. This project was unsuccessful but the contact between Unimation and NRDC was maintained and was subsequently instrumental in getting Unimation to convert their



sales office in this country into a full scale manufacturing operation for PUMA robot series. This was with joint-venture support from the NRDC. This support has continued and a further expansion of the Telford plant has recently taken place again with financial support from the BTG (NRDC).

Transpotech

Earlier this year the BTG (NRDC) set up a company to market the skills and expertise of the Transport and Road Research Laboratory. As part of the Department of Transport, TRRL had been unable to take advantage of opportunities which it foresaw for itself of undertaking consultancy and project management contracts in overseas countries. Not being a candidate for privatisation because of the nature and range of its mainstream activities, the TRRL needed a mechanism to exploit the commercial potential of its skills, hence the establishment of Transpotech. The company is now about to sign its first contract in which TRRL staff in conjunction with a number of UK companies including Plessey and Logica will undertake a feasibility study for a traffic control project in Hong Kong.



FILE

HZ
R/c: Mr Owen
Ind. Pol.

10 DOWNING STREET

From the Private Secretary

12 May 1983

Future role of the British Technology Group (BTG)

The Prime Minister was grateful for your Secretary of State's minute of 9 May about the future role of the BTG.

The Prime Minister would prefer to postpone taking any decisions on this matter until after polling day.

I am sending a copy of this letter to Richard Hatfield (Cabinet Office).

M.C. SCHOLAR

Jonathan Spencer, Esq.,
Department of Industry.

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10 DOWNING STREET

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Prime Minister

BTG

Please see now advice (attached)
from CPRS and Nick Owen.

Agree X in John Spanow's
minute, subject to Y in Nick Owen's?

Or would you prefer to leave
the whole thing over until after
June 9th?

Please delay
out

MCS 11/5

MR SCHOLAR11 May 1983

cc Mr Mount

FUTURE ROLE OF THE BTG

There seems to be general agreement that the BTG performs a valuable function not at present performed by others. But there is no reason why it need remain in the public sector, any longer than it takes to dispose of the NEB's assets. The BTG will have no obligations of a public service type, despite the impression given in Annex A to Mr Jenkin's letter, which mentions "providing a patent service". It already acts in a commercial way, seeking out and patenting only those inventions which offer it a commercial return.

I would therefore endorse Mr Sparrow's first recommendation to restructure the BTG financially: BTG should be given a "dowry", rather than be drip-fed and monitored by the DoI.

I would go further than his second recommendation. BTG's statutory guidelines should leave it free from all intervention on its methods of operation. It should not be burdened with obligations to regional policy nor be bound by DoI's priorities; BTG management has its own (probably superior) competence in technology transfer.

The prospective Chairmen should be told to work towards privatisation with a free hand in policy matters, but with no prospects of return trips to the Government for finance.

NICHOLAS OWEN

p. a. r.
→ NO

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Qa 06360

To: PRIME MINISTER

10 May 1983

From: JOHN SPARROW

Future Role of the BTG

1. Patrick Jenkin's minute of 9 May considerably clarifies his proposals. Much of what he suggests deserves support, but there are some aspects requiring comment.
2. The intention rightly is that BTG should operate commercially. If adequate competition emerges from the private sector, BTG's role will reduce; if not, its role will grow to the point at which it could be privatised. Therefore, it would be preferable to settle its capital structure once and for all and to make it self-supporting immediately rather than, as Patrick Jenkin proposes, for it to be given an annual PES tranche for a limited number of years (except for any funding of regional or non-commercial work carried out under contract).
3. With such a capital structure, it would be best if the Board of BTG could have the maximum possible independence. Its ability to operate commercially will crucially depend on the delegated powers it is given, but Patrick Jenkin's proposals give no details of the proposed statutory guidelines. You may wish to be satisfied that there will be no clawback of earnings to the Exchequer (which would adversely affect privatisation).
4. Annex A (the section headed 'Monopoly Rights') does not adequately deal with what follows the end of BTG's monopoly of publicly funded research. The implication is that the research institutions themselves will be responsible for exploitation (which we welcome) but in this context a return to the Exchequer is mentioned. A levy on an otherwise commercial deal could be a major disincentive. The return to the taxpayer should come from the increased economic activity generated by successful exploitation and not through a special tax on

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the innovation process. The forthcoming ACARD report to you on university-industry links will offer some guidance on this topic. I suggest that the issue should be left open for further study.

5. In summary, I recommend acceptance of Patrick Jenkin's proposals, but -

(a) with an initial capital restructuring, no clawback on earnings and no subsequent PES tranche (apart from the funding of any contracted work for regional or other non-commercial purposes);

(b) with statutory guidelines giving maximum commercial freedom to the Board and minimum scope for Department of Industry intervention;

(c) deferring any decision on what follows the removal of BTG's monopoly on publicly funded research.

6. I am sending a copy of this minute to Sir Robert Armstrong.

B.

IND Pol: BTG
AZ

5/5/83
Finance for Industry plc

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Deputy Chairman

5th May 1983

J. Gill, Esq.,
Deputy Secretary,
Department of Industry,
Ashdown House,
123 Victoria Street,
London SW1E 6RB

Dear Mr. Gill,

NRDC

Transfer of technology from the public sector
to private enterprise

For most of the post-war period NRDC has been the leading instrument of this transfer. The object is to ensure that, where practicable, the effort supported by Government funds in universities and research establishments benefits the UK economy and that NRDC should achieve a profit on its operation in so doing.

The operation involves:-

1. The obtaining of a flow of development from the relevant sources.
2. A preliminary assessment as to the possibility of commercial exploitation of the idea.
3. The protection of the intellectual property.
4. The development, in association with private enterprise in a variety of relationships, of the idea through its various stages to commercial exploitation.
5. The obtaining of a return (by royalty or investment) from the above work to cover the costs of the operation - including the costs of failures.

The whole process is time consuming and difficult and inevitably brings the strong possibility of conflict with partners at every stage, but particularly with the inventor who does not understand the difficulty of exploitation of his ideas and does not understand the need to cover the inevitable failures of other products if his own is successful.

There can be no doubt that over the whole period and scope of its operation in this field, NRDC has achieved a measure of success in obtaining exploitation while making a profit in this particular activity; covering its costs with a substantial surplus. The question must now be addressed as to whether the private sector, with its new-found interest in the subject, would in future be a better medium and could replace in the near future NRDC activity.

The private sector's activity is developing in three directions.

Firstly, by direct contact between companies and research departments; secondly, by the increase in the number and efficiency of specialist venture capital firms and, thirdly, by specialist licence brokers.

The first - direct relationship with companies - has been present throughout the period and is increasing. It is first class when it exists and should be encouraged. It leads to a cross-fertilisation between companies and research departments which has good advantages both ways and also to commissioned work which serves to reduce directly the cost of the research department which falls on the state. It also controls in some respects the direction of the effort of the department away from uncommercial ideas. NRDC has played quite a part in encouraging these arrangements, which in a number of instances, have developed from NRDC joint ventures.

The second - development capital organisations - are proliferating at a fast rate (particularly in the past two or three years) possibly under the stimulus of the US explosion.

My own organisation is still probably the biggest single operator in this field in the UK and is satisfied with the returns which it is now developing. It is not, therefore, surprising that I believe that this upsurge by the private sector is highly desirable and, while it ought not to require subsidisation should not be fettered. It is for this reason that I welcome the removal of any NRDC "monopoly" in the exploitation of the product of the research departments, although it must be recognised that some measures must be taken to ensure that the public who have paid for the research department receive some reward when the product is exploited.

The third - specialist licence brokers - is again a long-standing activity. It operates mainly in the area of already developed products or processes, often across national frontiers and while there has been some growth in recent years, it cannot be said to have achieved any great break-through so far.

Broadly, the important question is whether the venture capital organisations could now fill the role so far undertaken by NRDC. My own view is that at the present time they could not. Essentially because of the costs involved - both of money and more particularly of the specialist staff - these organisations must look for operations which can be carried through quickly and which offer substantial rewards in the short term without heavy investment in capital plant. Thus, both here and in the USA, the venture capital organisations have concentrated, for example, in development of and around the chip. There can also be a concentration in projects which, although long term, have a glamour which make the promoters believe that they will be able to introduce in a comparatively short period investors who will take up some portion of their interest at a profit on the totality of their investment at a very early stage in a long development process - perhaps the genetic engineering field is a good example.

There remains, however, a large area without this glamour where exploitation should still be practical on a basis which should show a margin over the cost of bringing it to commercial exploitation but in which, because the time scale is long, capital involved in development - whether for pilot and production plant or marketing - is high and/or there is likely to be a relatively limited market, a venture capital organisation with its return on capital requirement would be unlikely to be interested.

It is in this sector that in my view there is a continuing need for an NRDC to operate. NRDC still has the widest spread of university and research association liaison contacts - which do not concentrate in the "fashionable" universities and departments. The present operators in the private sector will not have the desire or the resources to match this for some years to come and no single group is likely to do so even in the long term. NRDC has what is arguably the best patent department in the United Kingdom (possibly ICI would dispute this claim, but I think no other) and the protection of what is after all public intellectual property is still a very necessary function. NRDC has wide-spread contacts with UK firms who are taking on the hard work of bringing ideas to commercial fulfilment over a wide spread of industry, including some of the basic industries which badly need a technical boost. Finally it has operated in the area for over 30 years on a basis which has involved no cost to the public.

In my view the case for the maintenance of NRDC operation in this function in the immediate future is clear. There are a number of interesting innovations now being taken by BTG in promoting technology transfer which we have every reason to believe will contribute to the problem. I have not, however, dealt with these aspects as we can at the present time only surmise about the outcome.

If NRDC is to continue it must of course be on the basis that it is free to enter exploitation arrangements which permit it to benefit from commercial success. In the normal way there will be licence royalties, but minority equity partnership should not be excluded. Having said this, I would not think it appropriate for NRDC to try to emulate the venture capital funds in taking controlling interests. I believe that their experience has shown that a satisfactory result can be achieved without these.

Yours sincerely,

L.V.D. Tindale / Bg.

Dictated by Mr. L. V. D. Tindale
and signed in his absence.