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THE HIDDEN LEGACY OF SCOTT

Weapons of Mass Destruction, Arms Control and Technological Change: A Review of the Governments Proposals to Control the Transfer of Technology by Intangible Means.

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Abstract: **One tangible legacy of the Scott Report has been the establishment of a Follow Up Unit 'Export Control Organisation' within the DTI. The Government has issued both a Consultation and White Paper. On the 10 November 1998 the Trade and Industry Committee held a second inquiry into various aspects of strategic (nuclear, biological and chemical weapons and delivery systems) export controls. An important theme has been the control of the transfer of technology by intangible means. A particular concern has focused on military and dual use technology, which can be controlled (arguably) in a tangible form but not if transmitted by intangible means i.e. fax, internet, e-mail, orally. Consideration has been given to the relationship between export controls for military and dual use goods and a parallel control regime for associated intangible technology. This paper considers the relationship between tangible and intangible technology as it relates to weapons of mass destruction and offers a critique of the governments proposals. The arguments are placed into a wider debate concerned with modern warfare, arms control and information technology. Focusing concern over the transmission of intangible technology is the second hidden legacy of Scott. It is fundamentally linked to the first and more public legacy concerning constitutional issues surrounding the role of the state in the arms trade.**

1. Introduction

With reference to the arms trade the Scott Report states 'A comprehensive review, is in my opinion, required, and long overdue, of the power of the Government to impose controls on exports from the United Kingdom.' The Report was concerned with a range of export licensing infringements which covered primarily conventional but also strategic weapons. Commentators have tended to interpret the legacy of the Scott Report by focusing on the constitutional issues surrounding the arms trade. However the Report has also generated a

debate about how we police the flow of intangible and tangible technology associated with weapons of mass destruction. The Scott Report did not consider nor make recommendations in connection with policing the transmission of intangible technology. However, it appears as a concern in subsequent Green and White papers as a controversial issue in its own right and was subject to ministerial comment before the Inquiry was set up. Both papers generated a wide response from commercial interests, human rights groups and the Universities. This paper focuses on this second more hidden legacy of Scott. The argument which is developed is that whilst the Governments proposals acknowledge the problems they adopt an evolutionary approach to control. However, it can be argued that information technology has led to a revolution in modern warfare. The distinctions between conventional and strategic weapons is breaking down at the level of warfare and the trade in arms associated with it. There is a danger that the Governments proposals are out of step with these changes. This has ramifications for the constitutional debate concerning the states role: a balanced ethical approach and scrutiny regime may simply be inappropriate when aspects of the arms trade cannot be controlled in the first place. There is a danger that a new global landscape has already emerged rendering such arguments irrelevant or obsolete. The Scott Reports second legacy is fundamentally linked to the first! At the very least this second hidden legacy of Scott should be understood as a second pillar to any modern states attempts to respond to the global challenge of policing and arms control in an information age.

The full paper is divided into five sections. Firstly the existing law and policing regime are outlined. Secondly the Governments recommendations for change are discussed and criticised. Thirdly the changing face of warfare and the trade in 'arms' is considered with reference to the work of the Tofflers and Freedman. It is argued that even on its own terms the Governments suggestions are failing to meet up to the scale of change in both warfare and the arms trade. The fourth section identifies some key issues for criminal justice and policing. The fifth section considers the ramifications of this hidden legacy for the wider constitutional debate surrounding the legacy of Scott and role of states in the arms trade.

1. The legal framework

In the arms control literature a distinction is made between weapons of mass destruction (strategic) and conventional arms. The former category are the subject of bilateral and multilateral agreements designed to prohibit their proliferation amongst nations. Such agreements may cover nuclear and or chemical and biological weapons. Each has unique technologies and present distinct control problems. The later category are less likely to be subject to national controls. They may include military equipment (including ammunition, machine tools, other support equipment) directed at both military and civilian applications. It may therefore have a dual-use. The conventional trade is covered by an EU protocol, UN register of Conventional Arms and the present governments ethical foreign policy.

In reality the two categories can overlap as, for example, the preferred delivery system for a nuclear warhead may be an ostensibly conventional missile delivery system. The problem of dual-use may extend to the manufacture of, for example, (apparently) innocent chemical agents, which, when combined can form the constituent parts of a weapon.

The UK's international commitments and obligations include; compliance with the Non-Proliferation Treaty (NPT); the Nuclear Suppliers Group (NSG); the Zangger Committee; the missile technology regime (MTCR) seeking to control the transfer of completed rocket systems and unmanned air vehicle systems; the Australia Group (AG) which focuses on chemical and biological weapons controls; the Biological Weapons Convention (BTWC) which covers development and stockpiling and transfer of biological and toxin weapons; the Chemical Weapons Convention (CWC); the Wassenar Arrangement promoting transparency and greater responsibility in the transfer of conventional arms, dual-use goods and technologies;

EU Regulations on the export of dual-use goods.

The UK's statutory framework includes; the Biological Weapons Act 1974 (BWA) making it an offence to develop, produce, stockpile, acquire or retain a biological weapon in the UK; the Nuclear Explosions (Prohibition and Inspection) Act 1988 (NE) making it an offence knowingly to cause a nuclear weapon test explosion or any other nuclear explosion either in the UK or outside the UK if done by UK nationals or companies; the Chemical Weapons Act 1996 (CWA) which implements the CWC. The Act makes it an offence for any person in the UK or any UK person overseas to develop, produce, use, possess or participate in the transfer of a chemical weapon anywhere in the world or to engage in military preparation or preparation of a military nature, intending to use a chemical weapon anywhere in the world (a legal person include corporation). In addition legislation on terrorism, Official Secrets Act and indirectly money laundering may catch certain activities relevant to the transfer and or export of equipment, material or technology.

In the UK (which is Europe's biggest manufacturer) the control of exports is by a licensing system administered by the DTI and policed by Customs. It is breaches of the licensing regime (or avoiding it all together) which caused part of the problem for Customs prosecutions and led to the Scott Inquiry.

Customs are in the front line of policing. The Import, Export and Customs Powers (Defence Act) 1939 (IEC) allows for the operation of a number of export controls. Export of Goods Control Orders are from time to time made and govern controls of the export of restricted goods and licensing requirements. Customs main criminal offences are to be found in the Customs and Excise Management Act 1979 (CEMA) sections 68, 167 and 170. These sections can be used for the export or import of prohibited goods (that is prohibited under the IEC) or where licensing irregularities have occurred.

2. The governments evolutionary approach to policing.

The governments suggestions

Cm 3349 identified as a key issue in strategic export controls: control over the transfer of technology by intangible means. The consultation paper also contained the extremely contentious suggestion as to whether the Government should try and control students being admitted to courses of study where there were grounds for concern that information derived would be used for the development of weapons of mass destruction. The latter question generated a negative response from the Universities and was not carried forward to the White Paper. However concern over policing the transfer of technology by intangible means was. Annex A of Cm 3989 point 7 says:

'some doubts were expressed about the practicalities of enforcement'

However the government:

'*proposes to introduce a new power to control the transfer of technology by intangible means for example via fax or email.Whilst this power would enable the government , if need arose , to introduce the same controls on other types of technology, we propose for the time being , to limit this wider offence to technology related to weapons of mass destruction*'.

Reference to Cm 3989, point 3.1.4 'goals' indicates Governments thinking: action against anyone found to be deliberately helping in any way a weapon of mass destruction

programme...a UK person or Company, might, without being directly involved in an attempt to produce a weapon of mass destruction, nevertheless, provides a service or information which could assist such a programme. The existing end-use control is intended to prevent the export of equipment which might be used in such programmes but the Government considers that; it would be desirable to introduce measures to prevent other ways in which such programmes might be given assistance, such as the transfer of technological information by intangible means or provision of technical services. In view of this, it is proposed to make it an offence to do something that would promote or facilitate the development or production of weapons of mass destruction either if the Government has informed someone that what he is doing poses such a risk or if someone knows by other means or has grounds for suspecting that a particular course of action might assist such a programme.

The terminology used in Cm 3989 is at times ambiguous as to exactly what it is proposed to control. The scope of proposed controls are dealt with at point 3.2.1. In outline it is stated that the Government proposes to provide that documents transferred abroad containing controlled technology should be subject to export licensing requirements, whether exported physically or in electronic form'. It is made clear that the concern is the 'ever increasing ease with which information can be transferred across national boundaries by electronic means, i.e. by fax or e-mail'. In the next section there is reference to 'information can be passed in non-documentary form'. In point 3.2.2 there is reference to 'intangible technology transfers. Under point 3.2.3 'possible controls on the publication of controlled technology on electronic networks' and 'publication of controlled technology'. Later in Annex A: 2, Objective c, the paper states as an overall am 'To enable the Government to impose controls on intangible transfers of technology'. It is then explained that 'whatever the means by which the transfer was effected, secondary legislation would provide that all technology in documentary form that was currently controlled when exported tangibly, should be controlled when exported intangibly'.

Objections to the principle of policing the transfer of intangible technology

The most vociferous objections were generated from the University sector.

In summary the response from the Committee of Vice Chancellors and Principals of the Universities of the UK (CVCP) on the consultation on the DTI Strategic Export Controls White Paper in summary) was as follows:

'The Paper poses an unacceptable threat to the operation and standing of UK higher education....The proposals will also inhibit trade , particularly in those areas of dual use technologies where the UK has a substantial share of the world market. they will discourage inward investment, since companies will resist investment in R and D if there is any prospect that the free flow of discoveries to subsidiaries in other countries will be impeded ...the White Paper fails to appreciate the character of advances in communications technology and the part they play in the way university teaching and research is carried out. It is simply impractical to police the continuous stream of information and ideas that characterise the global communications system in the way envisaged in the White Paper. Moreover, even if possible, controls over the transfer of information by electronic means would involve draconian and burdensome surveillance systems inimical to academic and indeed democratic principles...or research findings are increasingly disseminated electronically...overseas students figure prominently in postgraduate programmes. The proposed control of intangible exports would catch our universities everyday practice...the whole paper fails to distinguish between weapons technology and the basic scientific work that underpins it...the CVCP has no objection to the control of weapons of mass destruction but the white paper addresses topics that have nothing to do with such weapons and it fails to acknowledge that almost any advanced technology has a potential weapons application. In this respect the white paper fails to meet a central conclusion of the Scott Inquiry, namely that future export controls must meet precise objective that are fully and openly stated'

Dr Ross Anderson, Cambridge University drew attention to the practical effect of such proposals in the areas of technology, science and medicine. Dr Ross points out that potentially the teaching of medicine to foreigners would need licences because many of the core curriculum subjects such as virology are also central to chemical and biological weapons programmes. A physicist doing research in single-electron memories may use an electron beam litho machine to make prototypes but they can also be used to fabricate masks for military semi conductor. Dr Ross argues that existing regulations merely control the physical export and don't intrude too much into teaching and research but any new regulations would because they would cover access to software.

Compared to the reaction of the Universities that of arms manufacturers was more moderate and to some extent supportive, at least in principal to controlling the transmission of intangible technology.

The Defence Manufacturers Association (DMA) in a response to the earlier Green paper had pointed out that whilst concerns are easy to state they are impracticable to enforce due to the complexity of the issues. Multinational companies have plants and divisions all over the world, which are increasingly linked to the information super highway. The DMA point out the cost of, and problems in, training staff to detect or prevent transfers. However, they also make point the it is illogical that a license may be needed to post or carry a hard disc of such technological documentation, but one is not required for e-mailing or faxing exactly the same information.

In their memorandum to the Trade and Industry Committee the DMA said:

'Either technological information needs to be controlled or it does not, the controls should apply to all methods of potential transmission, in all forms...also support proposals at 3.2.3. regarding electronic networks, i.e. www, if worth controlling then it should be controlled in all forms'.

With reference to the White Paper the DMA:

'agreed in principle that some sort of control should be introduced on the intangible transfer of technology by intangible means but we strongly advise caution...laws have to be enforceable and practicable to be effective.

Sir Brian Tovey, Chairman of the Joint Electronics and Telecommunications Security Export Control Committee made similar observations and told the DTI Committee:

'I want to emphasise that there is nothing wrong in principle to with the idea of controls of intangibles. it is clearly right in principle..but how to police it is a difficult one... a company may have subsidiaries in Japan, R and D labs all over world...we accept logic of control of intangibles: if a license is needed to send technological information via the post it is ludicrous that you do not need one to send it via e mail/internet...but how to stop it?..there are cost implications, new controls should be negotiated internationally, so as to maintain level playing field.'

Sir Brian Tovey went on to consider problems associated with the dissemination of commercial software incorporating cryptography-an area vital to continuing development of global electronic commerce. In particular the tension between on the one hand, Industry which needs cryptography, digital signatures and security of information been sent, but on the other hand the governments need for access under clearly define circumstances.

The memorandum of the Society of British Aerospace Companies Ltd to the DTI Committee

makes a different point. That is that if intangible transfers become documents subject to controls then this would interfere with cross frontier inter departmental communications needed by newly consolidates international companies working with prime UK contractors in the area of common EU defence concerns.

The third category of representations came from human rights groups completely in favour of controls and their extension to conventional trade.In this respect the objections on behalf of the Universities are completely out of step with human rights organisations.

The Memorandum to the Governments White paper from Amnesty International UK (AIUK) states;

'AIUK believes that there is a strong case for the UK government extending the scope of intangible technology transfer control to that of technology specifically used for torture or cruel, inhuman an degrading treatment. Furthermore that intangible transfer of other technology/equipment banned under UK, international human rights or humanitarian law, e.g. dum dum bullets, landmines, laser blinding weapons should similarly be controlled'

A memorandum from the Campaign Against Arms Trade also supported controls over the export of intangible technology stating 'we are pleased' but then expresses disappointed that it is confined to weapons of mass destruction arguing that the controls should extend to all goods with a military end use. In a memorandum to White paper submitted by the British American Security Information Council (BASIC) states that they:

'accepts this proposal, provide there are safeguards against the prosecution who have no deliberate involvement. However they strongly recommend that the UK government extend the prohibition on technology transfers by intangible means which is specifically designed, or lends itself, to the production of weapons with indiscriminate effects such as anti-personnel landmines.'

Legal problems with the proposals

The White paper has problems with terminology, the legal framework/range of application and policing.

Different terms are used and this creates confusion about what exactly is to be controlled. Why technology? is technology the same thing as scientific? or engineering? chemical? It is probably not intangible technology that is transferred rather information with a scientific, technological, economic or sensitive content. In point 3.2.3. why publication? Is it intended to try and control exports across a border or transmission across a border or both ? The term 'intangible transfer of technology' is surely incorrect. With reference to the IEC 1939, CEMA 1979 and the CWA 1996, there is a need for a clear direction as to what exactly the law should be controlling the transmission of. In particular is the focus to be on the transmission or export-of technology or information or documentation? It seems that various combinations of these are envisaged and there are potential legal difficulties.

The White paper also has a problem with exactly how to approach a legislative framework. The vires of the IEC is framed in terms of carriage of goods. Power is given in the primary legislation for control to be by secondary legislation. The legislation was passed two days before the outbreak of the Second World War and was formed in terms of attempting to prevent trade with the enemy. The principle is that specified goods are prohibited by the DTI from being exported without a license. Categories of goods are specified and further defined by SI's. The onus is on the exporter to establish whether goods are, or are not subject to a licence requirement. This last point creates ambiguity because it will not always be clear as to whether a license is required and in what terms.

If a breach occurs then Customs can use a strict liability offence under section 68(2) CEMA or a more serious offence under Section 170 CEMA.

Section 170(1)(a)(iii) of CEMA refers to 'goods with respect to the importation or exportation of which any prohibition or restriction for time being in force under or by virtue of any enactment. Section 170(1)(b) states '...is in any way knowingly concerned in carrying, removing, depositing, harbouring, keeping or concealing or in any manner dealing with such goods...with intent to defraud...commits and offence. Section 170(2) CEMA broadens the categories of participation to those being knowingly concerned in a fraudulent evasion or attempting an evasion. The Customs liability regime directly links the prohibition (via the primary tariff of goods by type in the 1939 Act) plus further SI's which from time to time stated what is prohibited without a licence. It should be remembered that Customs used section 170 and strict liability offences under section 68(2) CEMA in the Arms to Iraq export cases which were subsequently investigated in the Scott Inquiry.

The underlying problem (leaving aside the policing difficulties) is with the term 'goods' in both the IEC and CEMA. Whilst it may be possible to think of goods or a document as being exported or imported as the legislation stands, it would not catch information. Through legislation the term 'document' was extended to cover the electronic transmission of pornography but the problem in the area of intangible technology would not be easily overcome by further amendments to existing legislation.

A final point to make is that Customs are reluctant prosecutors in the area of arms exports. They said as much to the Scott Inquiry. The problem is that they have no policy control, and there continue to be difficulties with communications between the Foreign and Commonwealth Office, DTO and Ministry of Defence concerning licensing. These difficulties emerged again recently in the Arms to Sierra Leone affair. The White paper recommends that whilst the DTI should control licensing Customs (under the supervision of the Attorney General) should police any new legislation.

Given the apparent importance of the issues we might expect that these proposals should be fully funded. Indeed the White paper contains a compliance cost analysis which states:

'the increased requirement for export licenses resulting from extending controls to transfers of technology by intangible means is unlikely to impose a significant burden on industry, particularly as would be spread over a large number of companies'

Then concerning licensing and policing (in summary) the White paper considers that there would be a slightly increased number of individual applications impose additional resource requirement on government departments (FCO, DTI and MOD) but the small size of the projected increase means that the impact would be limited. The DTI estimate that extra resources required for export controls organisation is one new member of staff at licensing process level at a total cost of £25.000 p.a (with or without London weighting?). Extra enforcement activity by Customs is expected to cost £500.000 per year.

The Trade and Industry Committee recommendations

The white paper and submissions to both consultation papers were considered by the Trade and Industry Committee on the 11th November 1998. The Committee recognised that 'new controls over the export of intangibles, raise genuinely complicated issues requiring resolution. The report accepted submissions on the problem of policing the transmission of intangible technology amongst many other issues. Other issues included; that licensable information was being transferred by intangible means in order to circumvent existing controls (the Committee felt that this would be difficult to detect), imposing burdens wider than recognised by

government and be at worst real nuisance to academic world. There seemed to be a consensus that fundamental legal, policing and administrative problems existed. The recommendation of the Committee are in the following terms:

'Grave doubts have been expressed as to the practicality of the proposals relating to the transfer of technology. Given the degree of controversy raised over the proposals in the White Paper, there can be no question of the United Kingdom agreeing to an extension in the EU's dual-use regime, under whatever legal power, until a consensus has been arrived at on the way forward on controls of intangible transfer of technology generally. The Government should consider limiting the proposed extension of licensing requirements to electronic transfer of documentation to technology related to weapons of mass destruction.'

3. A revolution in modern warfare and the trade in information

The Green and White papers and Trade and Industry Committee all recognised that controlling the export of intangible technology was part of a wider policing problem not confined to strategic weapons. The question which may arise is whether there is a revolutionary change in warfare and the arms trade or is the White paper simply out of step with the natural evolution of warfare and the trade associated with it?

Strategic weapons manufacture

A debate in the literature is that biological and chemical weapons are the preferred option in modern warfare amongst many countries. Missiles are the preferred method of delivery. The degree of integration between chemical and biological industries is complex. Further because of integration between commercial and defence industries it is often difficult to distinguish end use. Sometimes that use may be dual-use in any event. The R and D involved is global and the chemical/bio technology industries are entrenched in state economies. As is the arms industry. Communications are crucial and it is difficult to see how these can be policed. The issues were identified above when discussing commercial representations to the Trade and Industry Select Committee.

The issue of strategic information warfare

The particular area of concern is the impact of information technology as a central factor in a wide range of advanced military missions, including command and control, intelligence,

targeting and guidance.

The argument is that collateral damage can be minimised and that government and military infrastructure can be removed by the use of new technologies. It has been argued that the US achieved full information dominance in the Iraq war. Whilst ground forces were committed they had a relatively minor role. Information flow was crucial: some commentators describe this as a revolution in military affairs (RMA). The building blocks of RMA are intelligence, command, control, communications, surveillance and damage assessment linked together by sophisticated information technologies. The quality of the information and speed at which it is delivered is vital. Warfare is likely to be large scale, high speed high intensity. Lethal targeted blows are delivered without the constraints of time and space-at a distance, as one writer puts it a 'strategists dream.' It is argued that this is a developing field and may have implications for the strategic use of strategic nuclear weapons making their use more likely.

Four sensible observations are made by Freedman. Firstly, and despite military superiority of the West and USA, war remains about physical violence, it cannot be reduced to war between information systems. Secondly to fully take advantage of information technology still requires logistic support-the problem of instantaneous logistics! Information is not a finite resource. It is not however the same as knowledge. Sophisticated processing and modelling is required. Thirdly conflict on the ground may well still be more important than high technology fire power or information dominance. Fourthly that the concept and image which RMA generates may encourage an image of future wars which bear no relationship to the reality of how it occurs.

With these points in mind we can add a further observations. The expanding literature on virus attacks at the strategic or battle field level and possible CyberWars are important but should not be confused with actual warfare.

Implications for the trade in weapons

The revolution/evolution argument will continue. The trade in, and brokering of, information (in its widest sense) is likely to increase in importance. What is clear is that information technology has an impact from development through manufacture, use in war, surveillance, intelligence gathering, monitoring and counter attack. The arms trade is effected by these developments. However, there has always been a crucial role for information in warfare. This also extends to the control and disruption of information systems. Quite what is new (if anything) requires careful consideration.

4. Issues for criminal law, policing and criminal justice.

There are a wider range of potential implications for policing. In outline the following three points seem important:

Do we need new laws?

Apart from the existing licensing and Customs regime other controls do exist. The transmission of classified information in electronic form is covered by the Official Secrets Act. Technology mentioned in control lists would probably cover intangible property. The

legislation is not dependent on a particular means of communication, oral and electronic would be covered. Not all technology exports are controlled under licensing, but provided it is, the OSA would apply if it is transmitted. The problem with the OSA is that it only covers classified material. Further it is probably undesirable to use such legislation as a blanket deterrent.

CEMA can be amended along with the IEC. The IEC needs to be altered to include the export of information by its transmission overseas. The meaning of 'goods' and 'export' will have to be clarified. The tariff categories can be further defined by reference to chemical, nuclear and biological by statutory instrument. However, CEMA may also need alteration-especially section 170 so that it covers intangible technology. As the original rationale of the IEC was to prevent trading with the enemy the legislation may be better repealed. It is a large leap from goods to intangible property-it is a fundamental shift in emphasis.

However the underlying policing problems will not be overcome by such changes. It may be that improving the licensing system and communications between departments would be a better use of (apparently scarce resources).

A new law for the transmission of information?

A part of this problem is addresses in the US Economic Espionage Act 1996. The law created federal jurisdiction regarding both state-sponsored and the commercial theft of trade secrets. Misappropriation or theft of both intangible and tangible property became a crime under the act. In the UK this would immediately be problematical because property in intangible form cannot be stolen. However the US legislation contains an interesting approach. A trade secret is defined as all forms and types of financial, business, scientific, technological, economic or engineering information including patterns, plans, compilations, program devices, formulas, designs, phototypes, methods, techniques, processes, procedures, programs, or codes, whether tangible or intangible, and whether or how stored, compiled, or memorialised physically, electronically, graphically, photographically or in writing'.

With the aims of the White paper in mind a new offence might be formulated along the following lines:

An offence for any person in the UK or any UK person overseas to... ***participate in the*** **develop (*ment*), produc(*tion*), use, possess(ion) or participat(ion) in the transfer of a chemical,** ***nuclear or biological*** **weapon,** ***or to provide, by way of transmission, either directly or indirectly, whether within the UK, outside the UK or by way of cross border, information, financial, scientific, technological, economic or engineering in nature, including patterns, plans, compilations, program devices, formulas, designs, phototypes, methods, techniques, processes, procedures, programs or codes, whether tangible or intangible, and whether or how stored, compiled, or memorialised physically, orally, electronically, graphically, photographically*** **intended (or having grounds to suspect) to promote or facilitate the development, production, use or possession of a chemical, nuclear or biological weapon,** ***or to indirectly provide information to a broker having grounds to suspect that such information may be used in the development, production, use of a weapon of mass destruction*****....or to engage in the military preparations or preparations of a military nature, intending to use a chemical,** ***nuclear or biological*** **weapon anywhere in the world.**

Reconsidering the role of the arms manufacturer and trader

Fundamentally policing in the area of the arms trade is influenced by the political economy. Control requires that commercial interest pay attention to collective security concerns.

How far are industry prepared to go? Submissions to the Trade and Industry Committee

appear to accept the need for some controls starting with R and D and manufacture. With the limitations attached to policing, the participatory role of business is crucial. In this respect there has been a major shift in the relationship between state and manufacture of weapons and technologies. The major consequence of this change is that the private sector now produce over ninety percent of all weapons independent of direct government controls. Expertise are located in the private and not public sector accordingly. This shift is further exasperated because sensitive research and development are often sub-contracted by Governments to the private sector. This has led some commentators to link this change directly with the advent of an information age. If this is correct we have a new form of warfare and arms trade requiring a new form of policing. A type of policing in depth which starts with self regulation in the workplace. A type of policing which engages at every stage with the problems which information technology pose.

Policing the problems (assuming for the moment that there is sufficient mutuality of interest between manufacturer and state) should be thought of as in layers. 1. Company security measures; 2. State imposed or self regulation of transmission intermediaries; 3. Enforced company regulation because of dual interests. 4; International agreements; 5 Government licensing; 6. State monitoring and intelligence gathering; 7. Espionage/theft legislation; 8. CWA and similar; 9. Customs.

5. The two legacies of Scott

Various theoretical interpretations have been placed on policing in Cyberspace. We have in the two legacies of Scott an on going debate which can be linked to these theoretical arguments.

The Scott Report has generated a body of important literature dealing with standards in government. However, whatever the constitutional arguments are they may become irrelevant if the trade cannot be controlled. If technology and global commerce are phenomena outside state control then a focus on the constitutional high ground becomes irrelevant to the true problem. The position as stated by the last Conservative Government was to encourage the export of UK defence equipment unless there are compelling political, security or strategic reasons for not doing so.' The recent change in government has generated an 'ethical foreign policy' but it is doubted that there has been any fundamental shift. On the other hand as Lustgarten observes arriving at a satisfactory balance between on the one hand legitimate strategic and economic interests whilst on the other hand maintaining commitments to human rights (for example controlling the export of arms to repressive regimes) remains problematical. Lustgarten is pessimistic about the balancing act which is the Governments ethical foreign policy and argues that progressive disengagement from the trade is in the UK's national interest. Whilst the constitutional debate is important in the meantime both modern warfare and the trade therein continue to develop a pace.

The perception in the Government White Paper is rooted in consideration of technology linked to strategic weapons. In respect of non strategic weapons the Government positively encourages trade. So far as sensitive technologies are concerned trade restrictions and policing has as a policy aim: managing the potential risk posed by the diffusion of advanced weapons technologies. If policing is considered, then drawing a line between conventional and strategic

weapon is problematical with reference to technology, war and the trade in arms. That is not to say that some form of ordering cannot be attempted. Once the distinction becomes blurred then issues of political economy emerge and we have two layers of control, one for conventional and one for strategic. This 'layering' of control seems out of step with the changes outlined in this paper. One thing does seem certain as Williams puts it "supply push and demand pull" cycle of technology means that the supply of technology is a function of the potential in the current state of the art as determined by research and development, the institutionalisation of the latter activity this century especially since the Second World and the comparative advantages to and disadvantages between nations means that there is no hope of halting the supply of technology which is central to operation and development of multi nationals. It can be argued that it would be better to allow wider access to the technology in return for inspection agreements. If the technology is shared then it may encourage common export control agreements.

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