Scottish Affairs, No.13, Autumn 1995

WITHER THE ARMOURERS? MILITARY INDUSTRY IN SCOTLAND

Alex Law

Almost without warning, or so it seems, military bases and industries have become a measure of the virility of economics and politics in Scotland. The relocation of the contract to refit nuclear submarines from Rosyth dockyard to Plymouth in June 1993, and the effective closure of the naval base in July 1994, conspired to erect the Rosyth complex into a symbol for unstoppable industrial decline and political discrimination within the Union. **The Herald** of 24 June 1993 captured the mood when it exclaimed in a front page editorial headline, 'Rosyth: Decision which could break the Union'. Yet, despite being the largest single-site employer in Scotland for at least a decade, Rosyth had been hitherto a relatively obscure workplace. Nor was this simply the result of military secrecy. Such was the seeming normality and permanence of the extensive cold war network of servicing and manufacturing for the military in Scotland over the last forty years that it was rarely identified as an important factor in Scotland's economy, industrial structure or public policy architecture.

The British state is at its most unitary when it sets defence policy. Military industry is first of all defined by its relationship to the host state. The state has exclusive purchasing and regulatory authority over the output of the military industry (Smith 1990). It is therefore strongly placed to shape the

---

The author began working as an apprentice in the shadow of Beardmore's giant Parkhead Forge and worked at Portsmouth and Rosyth dockyards during the 1980s. He now tutors part-time in social sciences at the Open University in Scotland and sociology at the University of Edinburgh. This paper is part of doctoral research on the current restructuring of defence industries in Scotland. He would like to thank an anonymous referee for helpful comments on an earlier draft and Neil Davidson, Donald Hislop, Donald MacKenzie and David McCrone for their advice at different stages. Thanks are also due to the innumerable individuals within the industry who gave up their time to speak to him during the research.

structure of the market environment, the location, scale and scope of production and even corporate structures themselves. Wherever possible, British military planners preferred machines to mass bodies of armed men to compensate for shortcomings in force levels, service structures, Imperial 'stretch' and absolute economic size. This has resulted in British manufacturing being the most militarized in Europe and a general tendency for a 'ratcheting-up' of the size of its arms industry (Edgerton 1995); warlike production was greater in 1938 than 1913, 1939-45 than 1914-1919, and even more so during the cold war than during the inter war years.

As Lovering (1988) has noted, the military sector was exceptionally important for protecting some of Britain's industrial localities from the full effects of 'de-industrialization' as 'islands of prosperity'. The semblance of such 'islands' could be found during the cold war in parts of west Fife, Edinburgh and Glasgow. Yet this perverse form of military corporatism in Britain was always haphazard in planning the industrial and regional shape of military production, and contained within it an in-built bias which consolidated high-level spending and employment activities in the south of England. Thus a recurring tension existed between geo-strategic and socio-economic arguments for the location of military support in Scotland. Now, with the end of the cold war and the collapse of the corporatist framework, the British military support structure is contracting, but in ways that are having unequal effects throughout the arms industry.

The discussion here is necessarily restricted to tracing a few inter-related themes. First, I want to establish that work for the military has played an important, often central, role in developing and sustaining particular key industries in Scotland; second, that dependency on the defence market ties such producers to the vicissitudes of the British state's role and self-image in international state rivalries and alliances; and third, that powerful local industrial and political interests have been developed by the military industry in Scotland.

Although post-cold war cuts in UK defence spending and job losses have hit Scotland harder than most UK regions, the South East of England, albeit from a much higher base, has been the worst affected region in the UK. More important, however, is that the political and ideological significance of the current restructuring in Scotland differs markedly from other badly affected areas, such as the Thames Valley, Lancashire or Hertfordshire. Industrial and military issues in Scotland are indissoluble from questions of Scottish national identity and statehood. Here I am arguing that the defence sector has had distinctive implications for the social, political and economic shape of

Scotland, which have largely been ignored in conventional accounts of its economy or politics.

What follows attempts to discuss the current restructuring within this wider context. It is necessary, therefore, to trace in some detail how modern military industry in Scotland has waxed and waned. The discussion will show that military markets were critical to sustaining the rise of industrial Clydeside and prevented the collapse of important areas of industrial capital between the wars. At the same time, emerging technologies did not take root in Scotland until the 1940s, when military industry was critical to their development. And instead of viewing the stability of cold war defence dependencies as somehow typifying military industry, I will try to show that the particular set of institutional, geographical and class relations were unusual, by describing specific processes which favoured industry in Scotland. Because of the need to highlight the extensive political, technological, economic and social roles of the state in ordering the cold war arms industry I prefer to use the term 'technocratic militarism'. Finally, I will say something about the seeming denouement of military industry in Scotland within the current global restructuring.

MILITARISM IN SCOTLAND: FROM SOLDIERY TO INDUSTRY

The martial traditions of the 'Scottish soldier' are fairly well known. Historically, Scotland has been a reservoir for the most basic forms of physical force in warfare, such as the mercenary armies of the seventeenth century. High unemployment and concentrated recruiting drives have helped to reproduce a disproportionate recruitment of Scots into the lower ranks of the armed forces, particularly the army. A less well documented form of militarism in Scotland, however, has been the historical levels of industrial activity dedicated to producing military equipment.

Until the late nineteenth century, state demand for, and direct organization of, military production in Scotland compared unfavourably with England. Yet, between the 1880s and 1920 and again after the 1940s, Scotland was placed at the centre of global military-bloc rivalries. In the earlier period the west of Scotland was an integral part of the British naval-industrial complex, and in the 1950s Scotland assumed 'a political and military status in NATO out of all proportion to its size' (Spaven 1983, p.2). The British nuclear deterrent was sited at the Clyde Submarine Base at Faslane and Coulport in 1967, and a plethora of US and NATO facilities and British armed forces establishments 'transformed Scotland into a major place d'armes' (Erickson

1969, p.72). In the early 1980s Spaven (1983) catalogued the magnitude of this 'integrated defence establishment' in a directory listing some 219 military bases throughout Scotland.

THE FORMATION OF THE CLYDESIDE NAVAL-INDUSTRIAL COMPLEX

The military activities of the state, although not directly causing the rise of industrial capitalism, played a significant role in stimulating the form and pace of its development; capitalism crucially depended on the 'catalytic impact of military needs' (Sen 1984). The constant waves of demand created by the endemic wars and mass armies of the seventeenth, eighteenth and early nineteenth centuries were a 'forcing house' for scale economies and mass standardized output. This demand also had implications for the organization of production by increasing capital intensity and factory systems of rational work processes. Related to this is the transfer of mass discipline from the army to the workplace. Innovative technologies were further developed and used to meet military demands (McNeill 1983, ch.8). Such processes were far from uniformly adopted across Europe, however, with military strategists often resisting the use of the new weaponry and continuing to rely on traditional 'heroic' martial doctrines. However, technological innovations, such as the Gatling machine gun and modern explosives, and the mass mobilization of industry and men in the American Civil War, 'modernized' warfare in line with wider economic developments. In the Admiralty this led to the eventual triumph of what has been called 'navalism', based on the *materiel* school of organization, technology and engineering officers, over the 'historical' school of Nelsonian heroic command, martial spirit and a unified patriotic nation (Kennedy 1991; Edgerton 1991).

The development of the modern military industry in Scotland was part of this industrialization of naval warfare. When the Clyde shipbuilders Robert Napier and Sons were invited to submit proposals in 1859 for a new, revolutionary class of warship, the 'ironclads', a powerful set of institutional relations between industry in Scotland and the Admiralty was, at first haltingly, set in train (Peebles 1987, p.12). Traditionally the state-owned royal dockyards based in the south of England had built the bulk of the Royal Navy's wooden-hulled fleet, but with the advent of iron ships the main trend in naval construction was away from state-owned dockyards to private shipbuilders. Therefore, by the time that the 'big gun' dreadnought ships were introduced, 62% of the built tonnage between 1905 and 1914 now derived from private shipbuilders (Todd 1988, p.151), located in the emerging engineering centres on the Clyde and the North East of England (Todd 1981).

In the thirty years between the first 'ironclad' and the 1889 Navy Defence Act, the Clyde became an integral part of what Pollard and Robertson (1979, pp.96-102) call the 'amalgamation movement' towards a vertically integrated 'single international warship and armaments combine'. The major military companies became linked in three primary ways: firstly, through complete merger or shared control; secondly, through the common control of a subsidiary; thirdly, through interlocking directorates or stronger, informal associations. In these ways the military industrial 'Great International' became increasingly concentrated into larger units, and developed close relations with the host state, on the one hand, while pursuing international customers and partners, on the other (Sampson 1977).

This shift was clearly evident in Scotland. Napiers took on the form of a fully-integrated shipbuilding and engineering firm when they were awarded the contract for the second 'ironclad', the 'Black Prince', in 1859 (Hume and Moss 1979,pp20-5). Other Clyde shipbuilders, such as Fairfields and John Brown, and engineers such as Beardmore, took on Admiralty orders and came increasingly under pressure to follow the example of rival firms Vickers and Armstrong-Whitworth who, with Krupps of Germany, were the most advanced international armaments, armour and shipbuilding concerns of the early twentieth century (Trebilcock 1977). As a result of the competition for arms contracts came oligopolistic manoeuvrings and the increasing concentration and expansion of the main arms companies.

Through such machinations, the Clyde's importance as a military industrial area was established, based on warship-building, armour-plating, marine engineering, ordnance and guns. This process developed unevenly. The industry ultimately depended on domestic orders to establish product credibility for exports and, more importantly, to supply the host state with sufficient quantities of the latest advances in weapons equipment technology. Thus, while naval orders were relatively low for a short period after 1907, the boom in orders which followed as the naval arms race with Germany escalated did not translate into large export contracts or particularly high profit levels compared to the years before 1910 (Peebles 1987, ch.6). Nevertheless, although profitability varied over time, according to levels of demand and prices of materials and labour, it was still consistently more profitable than merchant work (More 1982). Naval contracts, however, involved a relatively small number of shipyards in peacetime and accounted for a small proportion of the total tonnage launched. And in strictly delineating design specifications, Admiralty orders could have the effect of eroding technical and competitive advantages for those yards inordinately dependent on such work. This operated as a barrier to product or process innovation, with only Yarrow developing indigenous warship design capabilities and the exports that design expertise helped to generate (Peebles 1987, pp.157-9). Here it should be noted, however, that naval contractors, because of their status as large vertically integrated concerns who were held to the exacting standards stipulated by the Admiralty tendering procedure, were much further advanced in introducing systematically organized production methods and techniques such as welding, than the less technically sophisticated merchant shipbuilders (Lorenz 1991, pp.108-9). Such work had a critical significance before 1914. Vigorous backward linkages in the Clyde area were created and, with more labour intensive and higher building standards, naval work generated at least some specialized shipbuilding capacity and labour markets.

As the Clyde grew in importance it attracted new firms and stimulated associated marine engineering suppliers. An important new yard was constructed in 1907 at Scotstoun on the Clyde to accommodate Arthur Yarrow & Co., the destroyer specialist, in a move from Poplar on the Thames, which was by then declining as a shipbuilding location (Borthwick 1965, pp.30-32). Suppliers of auxiliary machinery, such as Weir's marine boilers, valves and pumps, also benefited from the arms race and built up an international customer base, in line with the cosmopolitan character of the armaments industry in the years leading up to 1914 (Sampson 1977, pp. 58-60). As late as 1913 company publicity claimed that Weirs were contractors to not only the British Admiralty and the War Office but also to some twenty other governments including: South America, the United States, Scandinavia, Russia, Siam, China, Turkey, Greece as well as the main powers in Europe (Reader 1971, p.37).

WITHER THE ARMOURERS? WARTIME BOOM AND INTERWAR SLUMP

The accelerating development of military industrial capitalism culminated in 1914 with the outbreak of the first 'total war' of the century. The front in the age of total war stretched from the theatre of actual combat to the industrial effort on the factory floor. Total war meant that war became industrialized, and industrial output, if not managerial regimes, became increasingly militarized. In common with other major armaments manufacturers, Beardmore integrated its existing plant to expand munitions production. With the aid of wartime government loans massive capacity was added to the factories at Parkhead, Mossend and Anniesland. Beardmore's huge output covered the widest range of armament production, including naval and field guns, ships, tanks and large complex, one-off airships. At least nine other Clydeside engineering firms became constructors of aircraft, including the shipbuilders William Denny and Barclay Curle. Weir built complete, standardized aircraft on a mass scale and made a range of armaments, including gun carriages, trench howitzers, mines, pistols for spherical mines, percussion gear, recuperators for guns and diesel engines for submarines. Weirs' workforce doubled, the premises were expanded and attempts were made to introduce new work processes and management techniques. The attempt to militarize mass production during wartime in part triggered the militancy of Red Clydeside (Reader 1971, pp.67-81). In shipbuilding, the Clyde's massive wartime output of naval vessels was built by some thirty separate firms, although most of this tonnage was attributable to the six specialist war shipbuilding yards, while many other firms, such as Singers of Clydebank, converted to munitions production for the duration of the war (Peebles 1987, pp.88-9).

With the Armistice, the fortunes of firms locked into the naval-industrial complex like Beardmores became entwined with the alternating prospects of war. In the 1920s, many such firms went into chronic decline and were only rescued by the rearmament of the late 1930s, if they managed to survive intact the austere middle decade of the inter-war years. As the historians of shipbuilding and engineering in the west of Scotland show, even where Beardmore attempted to divest itself of Admiralty dependency their efforts were often thwarted (Moss and Hume 1977, pp.66-7). Despite massive investments in the Beardmore empire, the funding of technological innovations and strenuous efforts to diversify into aircraft construction, the accumulation of debt that such initiatives imposed on the company and the lack of profitable opportunities frustrated the efforts to loosen the binding ties of the naval-industrial complex. Only with feverish rearmament did the profitability of the steel-armour-heavy engineering-shipbuilding nexus re-emerge as an attractive prospect for capital.

If the private warshipbuilders in Scotland lived a precarious existance, the state-owned dockyard at Rosyth, Britain's most modern dockyard, fared just as badly, and was effectively closed down on a 'care and maintenance' basis in 1925, along with Pembroke in Wales. An earlier indication of the vulnerability of Rosyth to the Admiralty axe had been evident with the mass discharge of 3000 workers in 1922 (**Dunfermline Press**, 28 January 1922; 18 February 1922). As part of an Admiralty campaign to keep the dockyards under naval control and stave off the commercialisation of their operations, Rosyth was closed to satisfy Treasury demands for naval economies. An unconvincing rationale for closure was made by the Admiralty, with the choice of Rosyth reflecting the Navy's preference for retaining the historic southern home yards against what was viewed as a militant and culturally alien northern one (Ward 1988, pp.84-7).

THE ARMOURERS REPRIEVED: SCOTLAND IN A TOTAL WAR ECONOMY

In the total war economy, the state took increasing powers to organise and direct industry. Because of the reluctance of firms to invest in new or expanded capacity the government built 'shadow' factories and handed them over to private firms to run on the state's behalf. The shadow system of production had important consequences for the siting of industrial capacity in Scotland. In 1939 Rolls Royce came to Scotland to organize a large agency factory to satisfy an Air Ministry demand for a virtual doubling in the output of Merlin engines (Hornby 1958, p.257). With the choice of location for the factory at Hillington, near Glasgow, strategic policy overlapped with industrial and regional policy. The firm was concerned about the militant reputation of Clydeside and had to be coaxed by the Air Ministry to occupy the government-built Hillington site (Hornby 1958, p.290).

Similar sentiments about the suitability of 'proleterian Scotland' for war production were expressed elsewhere. Thus the Air Ministry were anxious about aircraft production being managed by Scottish Aviation Limited (SAL) at Prestwick. For one official, the west of Scotland was synonymous with 'Red Clydeside' (Robertson 1986, p.26). In the event, SAL became an important aircraft firm for the Air Ministry but failed to break into the top ranks of an industry which remained concentrated in the south and west of England. Resentment also grew in Scotland over the way that factories were taken over by the government and taken out of production while women munitions workers and coal miners were forcibly transferred to work in England (Harvie 1981).

As rearmament proceeded, the 'surge' refit and repair capacity represented by Rosyth now became badly needed by the Admiralty, particularly since it seemed to be relatively immune from air attack. The dockyard was eventually raised from 'care and maintenance' status in 1938 and the workforce grew from 1000 in 1939 to 5000 by 1941 (Brown 1983, p.283). The fifteen idle interwar years at Rosyth had, however, resulted in a deterioration of the operational readiness of the facility. For instance, some 3 million cubic yards of accumulated silt had to be removed from the harbour to restore the dockyard approaches to the minimum acceptable depth (Kohan 1952, pp.246-7). The diluted composition of wartime dockyard labour reflected the loss of skilled male workers during the period of retrenchment. For every 100 skilled men under the age of sixty employed in 1939 there were only 54 by 1945, while nine were now over the age of sixty, with the rest composed of dilutee and women labour (Brown 1983, pp.284-5). A report into the dockyards for the Ministry of Labour in 1941 singled out Rosyth for special criticism, complaining about the high rates of leave and sick absenteesim, idleness and 'subversive elements' who could not be dismissed before lengthy Admiralty procedures had been gone through. One navalist historian argues that this was because workers at Rosyth 'were mostly rejects from other industries' (Stewart 1993, p.151). Recruitment at Rosyth had taken place too late to prevent available skilled labour from being engaged elsewhere in industry.

SCOTLAND IN A 'PERMANENT' ARMS ECONOMY: TECHNOCRATIC MILITARISM IN SCOTLAND

The cold war not only rearranged the hierarchy of weapons technologies but also ossified the geographical distribution of its production. Defence companies were largely protected as 'islands of relative prosperity' from the decline which afflicted much of British industry during the Cold War (Lovering 1988). Although such 'islands' resisted a straightforward spatial division of labour by function, the cold war 'spatial-fix' was generally biased towards the south and west of England. Within this Scotland became an important sub-centre of arms production.

The cold war arms industry in Britain was exceptionally large. In drawing a contrast between the unevenness of military spending, infrastructure, technological sectors and labour markets in Bristol and South Wales, Lovering (1985) argues that ideological images of place held by elites also partly influenced the allocation of defence investments and contracts. In this account Bristol was advantaged by being seen by elite groups as part of the 'English heartland' offering suitable life-style packages, while the imagery of South Wales differed as militantly proletarian with a non-English, incomprehensibly foreign culture. As we have already noted, when it came to the closure of Rosyth in the mid-twenties, the relocation of Rolls Royce to Hillington in 1939 and the Air Ministry attitude to Prestwick at the start of the war, a similar image of place prevailed for Scotland among the military-bureaucratic class. Yet, until nationalism became a political force in the 1970s, Scotland, especially the east central area, came to be viewed as a reliable centre of defence production.

Vigorous campaigns were organised in Scotland to prevent another rundown of industry at the war's end. The main focus of these were publicly-owned plant - the Royal Ordnance Factories, Prestwick Aerodrome and Rosyth dockyard. At least 46 other wartime government factories were allocated to private industry after the war, including Rolls Royce at Hillington and Ferranti in Edinburgh (Cmd 1947, pp.90-91). The emerging corporatist apparatus in Scotland was mobilised behind demands for a more equitable distribution of UK defence work and factory conversions to civilian production.

One indication of the success of technocratic nationalist appeals in Scotland was the post-war reversal in fortune for Rosyth, which became strategically important with the onset of the cold war. When cuts in dockyard capacity eventually came, Rosyth emerged in an even stronger position. Pembroke was again closed in 1947 and the 1957 Defence Review closed Sheerness and Portland at home and Malta dockyard abroad; further cuts in 1963 and 1969 fell on the historic southern yards, while the nuclear refit capabilities at Rosyth meant that employment levels grew. The 1981 Defence Review again strengthened Rosyth while Chatham and Gibraltar dockyards were closed and Portsmouth's functions were massively reduced.

The primary research effort was, and continues to be, largely concentrated in a 'triangle of military privilege', stretching between the Thames Valley, the M4 corridor and Dorset. Clustered in the south of England, the close spatial proximity of research departments to Ministry of Defence decision makers and high-technology contractors and their suppliers perpetuated precisely the kind of regional unevenness that the technocratic 'developmental' state aimed to curb. This unevenness in regional shares of military industrial R&D, once consolidated by the cold war, simply could not be overcome by the 'developmental' state.

However, the post-war Scottish economy was not entirely unaffected by the stress on military uses of science and technology. Although military R&D was unevenly spread, a range of important design and development capabilities was generated in Scotland, particularly in electronics and instrumentation, to an extent unmatched by indigenous civilian industry. Here the case of Ferranti in Scotland is particularly significant. Ferranti came to Edinburgh in 1943 to manufacture gyroscopic gunsights for the RAF, and survived the post-war downturn by recruiting a talented team of design engineers from government research establishments. By the early 1950s, Ferranti was one of the most technologically advanced firms in Scotland and had established itself as a leading military radar designer. It expanded in Scotland in a spectacular way, growing from 110 employees in 1943 to 7500 by the early 1980s and occupied 1.5 million square feet of floor space across ten sites (Ferranti 1993).

As a spin-off from this, Ferranti has been central to the development of an electronics industry in Scotland. Ferranti had been involved in the Scottish Council's 'Electronic Scheme' in the 1950s and, as one study put it,

> [m]any of the multinational electronics companies that chose Scotland as the location for European facilities recruited their core engineering and management staff from Ferranti, and the company produced several entrepreneurial figures who went on to play key roles in the formation and growth of indigenous electronics companies such as Fortronic, MESL (now part of Racal) and Nuclear Enterprises.
> (Firn and Roberts 1984, p.319).

However, largely because of the different structures demanded by military markets, the spin-off from Ferranti has not been as great as comparable civil firms might generate. The need to adopt extensive in-house facilities for components and sub-contracts to ensure reliable supplies of Ministry-specified quality inputs inhibited the complex of local linkages associated with traditional military industries based on steel, coal and heavy engineering. Nevertheless, it has been estimated that as recently as the early 1990s military electronics in Scotland accounted for some 1500 professional engineers, scientists and related-technologists (PESTs), one in four of all PESTs in Scotland's engineering industry (ELDDI 1993).

The condition of mutual dependency between the state and military industry sustained a network of corporatist interests in Scotland. With Toothill, the manager of Ferranti in Scotland, chairing the Scottish Council's 1961 'Inquiry into the Scottish Economy', the role of the military industry in securing support for the technocratic statist solutions to uneven development is evident. This was made even starker as pressure for political devolution grew in the 1970s. Regional policy was viewed as a means of constitutionally preserving the relationship between the Scottish sub-state apparatus and the British state (McCrone 1993). The other side of technocratic militarism, however, was a hostility to any threat to the unity of the British state being posed by nationalism. Thus Toothill chaired a Unionist pressure group, 'Scotland is British', while others, such as Yarrow the warship-builder, threatened to move production to England should any form of devolution be implemented (Dalyell 1977).

More recently, before the 1992 general election the managing director at Rosyth intervened to describe SNP proposals on an independent, non-nuclear Scotland as not 'credible' and 'an irritant'. The culmination of the bids to refit Britain's nuclear submarines coincided with the opening salvos in the 1992 General Election, with Conservative politicians from the south coast actively milking governmental and military-bureaucratic sensitivities about Scotland's uncertain political future (**The Herald** 7 February 1992). The Rosyth management felt that the continued operation of the dockyard was at great risk, having only just staved off Ministry of Defence closure plans, and that they were being further disadvantaged by the Scottish 'dimension'. The Rosyth bid to refit Trident struggled to climb the very steep political gradient shaped by the prospect of few political gains accruing to Scottish Conservatives from a successful Rosyth bid and the anti-nuclear separatism of the SNP, while the pro-nuclear, Unionist Labour Party had little chance of affecting the final decision. What this highlights is the extreme sensitivity of the defence industry in Scotland to the future constitutional arrangements of the British state.

NATION, CLASS AND PLACE IN THE CURRENT RESTRUCTURING

If the geo-political cold war ended in 1989, then 1985 was the year when the corporatist cold war ended in Britain. As we have seen, relations between the state and military industrial capital have assumed a diverse range of forms, in which the relative stability and extensive direct state intervention of the cold war period was highly unusual. By the early 1980s it was becoming increasingly apparent to government and industry that this remarkable institutional stability could not be sustained. Fiscal constraints and escalating costs of weapon technology resulted in an attempt to restructure military industry. Lovering (1990, p.458) argues that,

> Faced with over-capacity, and an inheritance of employment and production practices suited to a more indulgent age, the British defence industry is currently engaged in a radical restructuring, far more so, in general, than UK civilian industry.

Since the mid-1980s military expenditure has fallen; competition introduced into procurement procedures; major, costly projects cancelled; administrative procedures reformed; and direct forms of government support have become less apparent.

In 1992 it was estimated that Scotland was more dependent on defence expenditure than the UK as a whole. Defence spending in Scotland directly supported 75000 jobs (3.2 per cent of the workforce), with 55300 of these civilian jobs (Scottish Enterprise 1992). Against a contracting defence industry during the 1980s, Scotland was one of the few regions where employment levels expanded. Table 1 gives a more conservative set of figures from the Ministry of Defence's own regional direct employment estimates. From these it can be shown that the kind of work done for the military in Scotland tends to be more labour-intensive than other regions, apart from the North of England, with Scotland taking 8.5 per cent of UK employment from 7 per cent of spending on equipment. Table 2 shows that since the 1980s there has been massive contraction in employment levels throughout the UK defence industry. In the five years between 1987-88 and 1992-93 around 6,000 jobs were estimated to have been lost in Scotland. This amounts to well over a third of direct defence equipment employment. The percentage job loss in Scotland was the second highest of any region of Britain after the South East of England, and well above the typical UK region job loss of one fifth of 1987-88 employment levels. The share of total UK defence employment attributed to Scotland also fell by one percent, the third highest loss in relative position behind the South East and East Midlands of England.

Table 1
Regional breakdown of Ministry of Defence spending on defence equipment and associated direct employment 1991-2

	Spending £m	% of UK total	Direct Employment	% of UK total
South East England	2750	34.0	47000	33.5
South West England	1400	17.5	24000	17.0
North West England	1100	13.5	17000	12.0
North England	900	11.0	19000	13.0
Scotland	600	7.0	12000	8.5
West Midlands England	550	6.5	9000	6.5
East Midlands England	250	3.0	5000	3.5

Yorks/Humberside	200	2.5	3000	2.0
Northern Ireland	150	2.0	2000	1.5
East Anglia	100	1.0	2000	1.0
Wales	100	1.0	2000	1.0
UK total	8100	100	140000	100

Source: adapted from Defence Statistics 1994, HMSO, p10.
Note: Estimates do not always add up because of rounding

Table 2
Regional change in estimated defence-equipment employment, 1987-8 to 1992-3

	Number	% change	Change in % share of UK total
South East England	-28000	-39	-5
South West England	-8000	-30	+1
Scotland	-6000	-37.5	-1
North West England	-6000	-30	+1
North England	-4000	-21	+2
East Midlands England	-2000	-33	-2
West Midlands England	-1000	-11	+1.5
Yorks/Humberside	0	0	0
Wales	0	0	+0.5
Northern Ireland	0	0	+0.5
East Anglia	+1000	+100	+1
UK total	-54000	-	-

Source: adapted from Defence Statistics 1994, HMSO, p.10
Note: Estimates do not always add up because of rounding

The concentration on manufacturing and, to a lesser extent, on electronics in Scotland makes the remaining jobs particularly vulnerable, with further losses of around 9500 to 15500 jobs predicted between 1992 and 1995. Within Scotland, Fife is the most dependent region. In Fife, four out of five defence jobs are based in the Dunfermline district (FRC/FE 1991). In 1991 it was estimated that just under 30000 jobs in Fife, about one in every four, were either directly or indirectly dependent on defence to some extent, with 14000 civilian jobs dependent on the Rosyth complex alone (FRC 1993). These jobs are typically full-time, male and skilled, based mainly in a handful of mechanical engineering and electronic and electrical engineering firms, owned and controlled outwith Fife, indeed outside Scotland (FRC/FE 1991). Between 1991 and 1994 around 3000 jobs had been lost in Fife, and the projection for a further 3000 to go by 1997 may be exceeded. In Lothian, where defence-related work has been the principal support of manufacturing, some 23450 jobs were estimated to be directly dependent on defence in 1993. These jobs accounted for about one in five of all jobs in manufacturing and 7 per cent of all employment in the region (ELDDI 1993; Dabinett 1993).

The leading avionics firm in Scotland, Ferranti (now GEC-Marconi Avionics), has undergone a similar contraction after financial difficulties in the 1980s to that of Beardmore in the 1920s. Table 3 takes the amount of floor space occupied by Ferranti in Scotland between 1986 and 1994 to indicate the extent to which the seemingly permanent expansion of the previous forty years has been reversed. After peaking in 1990 the number of sites Ferranti occupied in Scotland fell from 11 to 5 by 1994 and around one third of floor space was vacated. Over the same period the workforce was halved from around 6500 to 3300 after successive rounds of redundancy (company sources).

Restructuring then has grave implications in Scotland. Military industry is in the process of protracted rationalization and increasing concentration and centralization as the principal corporate response to shifting kinds and declining levels of state demand. In this process the free-market ideology of competition, privatisation and 'value for money' nestles uneasily with the central role of the state in shaping demand and subsidising the arms economy.

In the absence of a national plan for managing the wider industrial, economic and social consequences of military restructuring, public agencies have substituted by routinely adopting orthodox local regeneration strategies (Dabinett 1994; Lovering 1989). A tension exists between this kind of 'market-led' strategy and the state's need to retain a spread of military technological capabilities, a tension reflected in the Scottish Defence Initiative, launched by Scottish Enterprise in 1992. In this process, the dependency on the UK state as customer, the problems of external control and decision-making and increasing concentration in the industry mean that there is little autonomy which is distinctively Scottish to be negotiated.

At the same time the industry is beginning to resemble something of the character of the pre-1914 giant oligopolies and monopolies within an increasingly international arms market. For example, GEC-Marconi Avionics' Edinburgh operations are developing the radar for the new European fighter aircraft (EF2000) and have already formed a joint venture company with Thomson CSF of France, based in Paris, to explore the next generation of radar technologies before EF2000 has even gone into production. Table 4 indicates the location, sector, defence dependency and the extent of this monopolisation in Scotland in the early 1990s by a handful of 'national champions', principally GEC and BAe. Virtually the entire industry has its decision-making centres based outside Scotland.

Table 3

Shifts in floorspace occupied and site-specific employment at Ferranti and GEC-Marconi Avionics in Scotland, 1986 to 1994

	Square feet	Numbers employed on site		
Site		1986	1990	1994
Crewe Toll	323000	1944	1528	1379
Robertson Avenue	319500	1371	998	-
Silverknowes	259000	1792	1250	958
South Gyle 1	196150	915	923	590
South Gyle 2	98250	-	590	377
Bellshill	64700	214	204	-
West Shore Road	50000	167	110	72
Bellesk House	32500	42	159	-
Telford House	16500	88	57	-
Tantallon	16250	31	34	-
Turnhouse	12000	7	6	7

Total floorspace occupied	1387850	1289600	1387850	938400

Source: Company sources

The fortunes of the military industry in Scotland are likely to be mixed as the endgame in the British restructuring approaches. The closing moves are likely to be played out between GEC and BAe over the sale of VSEL, the Trident submarine manufacturer at Barrow, which together with Yarrow and Vosper Thorneycroft are Britain's only remaining warship yards (**Financial Times** 13 October 1994). This is happening amid claims and counter-claims about the impact on Yarrow, Rosyth and even the civil loss-making Jetstream complex at Prestwick. Any eventual takeover or merger between the two UK giants, GEC and BAe, will have further reverberations for the defence sector in Scotland.

Yet within the emerging uneven geography of the arms industry the tendencies have not all been in one direction. Scotland remains an important bastion of British arms production while some regions in England are in terminal decline. In the case of the rationalization of warship-building capacity, it was partly the placing of three contracts in Scotland, the order for three Type 23 frigates placed at Yarrow, the collaboration between VSEL and Kvaerner's Govan yard to share work on a helicopter carrier for the Royal Navy, and the refit of RFA 'Sir Bedivere' at Rosyth, which finally ended shipbuilding at Swan Hunter on the Tyne. Both GEC-Yarrow and BAe SEMA in Glasgow are part of the GEC-led UK consortium collaborating with Italy and France in the European new generation frigate programme, Project Horizon, estimated to be costing £7.5 billion overall (**The Scotsman** 19 February 1994). Moreover, the only Scottish-owned player with a corporate interest in these end moves is the Weir Group, who have maintained a stake in the management consortium at Devonport which, of course, eclipsed Rosyth for the nuclear submarine refits. Given this deep corporate and political integration of the defence industry at the British level, where lies the Scottish interest?

In conditions of technocratic militarism, defence companies, like Ferranti, often fostered a paternalistic affinity with the host community, emphasising the positive social and economic benefits of its activities for the locality, and were actively involved in Scotland's institutional set up. Defence companies in Scotland could thus play on the benefits of the dual British-Scottish identity. Ferranti, for instance, were extremely keen to play up the 'Scottishness' of the Scottish Group. As one of the most profitable and decentralised parts of the company, Scottish managers contrasted their performance with the English operations, particularly during periods of crisis. One manager said of the 1970s crisis in the company, 'in Scotland we felt that the good return on capital we were generating was disappearing down some Englishman's throat' (Interview).

Despite the erosion of corporatism and massive job cuts, remoteness from the corporate centre for firms in Scotland has not yet resulted in the expected flight of the industry 'home' to the South and Western core of UK arms production. What seems to matter here is the high levels of operational autonomy that defence firms are able to exercise locally, particularly in research, development and design functions. While the twin pull between the corporate centre and the locality has been largely replaced for managers by a 'placeless' obsession with the balance sheet, this does not mean that defence companies have suddenly become mobile and can easily shift specialised physical capital and trained labour acquired over many years. As one manager at GEC-Marconi put it when asked about fears that GEC might transfer production of the EFA radar from Edinburgh to new capacity in Milton Keynes,

> a possible transfer ... doesn't hold water. In all its dealings GEC makes cost-efficiency decisive in allocating costs. It is therefore extremely doubtful [that] EFA will move to Milton Keynes because of the cost burden of setting up production from scratch when it makes far more economic sense to bed production into the site where it was developed in the first place.
> (Interview).

The demand to conduct or refuse commodity relations in a specific place and no other can also be a powerful factor for situating class in local, national and even global contexts (Hudson and Sadler 1986). This applies to divisions and conflicts in the military industry as in any other. For instance, after the Pinochet coup in Chile in 1973, equipment to be installed on a Chilean warship at Rosyth dockyard was 'blacked' by TGWU shop stewards in an act of international class solidarity. In contrast, the territorially-based cross-class campaign to secure the Trident contract (and jobs) for Rosyth in 1993 reflected a set of narrowing identities around 'our' place and 'our' work. The shifting senses of class and place is further evident in the 'twinning' by ordinary trade unionists of Rosyth naval base and Exeter naval depot, both threatened with closure by the Front Line First defence review (**Dunfermline Press** 7 October 1994).

Identities and interests can only be discussed in concrete cases, and not as simple dichotomies between 'Britishness' and 'Scottishness'. The social relations of place depend on particular processes and definite historical contexts and are not simply reducible to questions of preferred identity, cultural symbols or constitutional forms. We have already noted some of the ways that the politics of place were raised in the pre-1945 attitudes of the British military-bureaucratic class to the industrial working class in Scotland, the campaigns conducted at the end of the war as part of the emergence of wider corporatist solutions, and the role of corporate interests in mobilising behind the Union in the 1970s.

Table 4

Main defence companies in Scotland 1992-93

Company	Parent company (Country)	Workplace location	Sector	Defence dependency (approx)	Employment (approx) 1992-1993	
Ferranti Defence Systems	GEC (UK)	Edinburgh	Electronics Avionics	100%	5000	3753
Yarrow Shipbuilders	GEC (UK)	Glasgow	Warships	100%	3300	3047
Royal Ordnance	British Aerospace(UK)	Bishopton	Ammunition propellents	100%	750	n/a
Rosyth Royal Dockyard	Babcock International/ Thorn EMI(UK)	Rosyth	Shiprepair	90%+	4500	3550
Barr and Stroud	50:50 Pilkington Optronics/ Thomson CSF(UK/French)	Glasgow	Electro-optics	Heavy dependency	1250	859
Marconi Radar and Control Systems	GEC(UK)	Hillend and Donibristle in West Fife	Electronics	Two-thirds	750	See FDS

BAeSEMA	50:50 British Aerospace Sema Group(UK)	Glasgow	Design, management software consultancy	Substantial	750	500
Nobel's Explosives	ICI (UK)	Stevenston, Ayrshire	Fuses, propellents	Substantial	2000	900
Hughes Micro-electronics Europa	General Motors (US)	Glenrothes	Electronics aerospace	Substantial (for US DoD)	700	760
Rolls Royce	(UK)	Hillington and East Kilbride	Aerospace	50%	4000	4820

Sources: Adapted from Business Strategies Ltd and Janes Consultancy Services1992; ***The Scotsman****, Business 300 1994, 14 December 1994*

Where technocratic militarism attempted to bind materially the enclaves of defence dependency in Scotland to the UK state it was premised on the ideological certainties and strategic rationale of a bi-polar cold war world. The new defence industrial base in Britain is being forged through the political 'pull' of a global system of still nationally prescribed states and the economic 'push' of internationally organised production. The resulting 'market-based' restructuring means the abandonment of technocratic militarism for a return to disorderly militarism, increasingly beyond public control, benefiting few workers and still fewer communities (Lovering 1995).

CONCLUSION

The autarchic structural 'fix' of cold war militarism is being prised apart in the current bout of restructuring. The national-populist myth of the 'enterprising Scot' succeeding in a golden age of pacific, family-based civil industry in Scotland, ignores the fact that for more than a century major industries in Scotland, such as shipbuilding and heavy engineering and, more recently, electronics and aerospace, crucially depended on the arms business and state patronage. In its turn these sections of industry in Scotland helped to supply equipment essential to the British state's Imperial role. That this is changing has already had some effect on the national sense of equitable treatment within the terms of the Union. The defence of place-specific production in Scotland was an active force, along with the strategic imperative, in shaping the post-1945 location of UK military industry. For the former islanders of (relative) prosperity, the current global restructuring seems to be imposing an irresistible logic of 'economic necessity' on communities and workplaces. Yet the demand by the central state for armaments ultimately results in political choices being made, either by default or by design, about where and by whom the brunt of restructuring should be borne.

REFERENCES

I would like to thank John Lovering, Jonathan Slow, Philip Taylor and Simon Wakefield for drawing particular sources to my attention.

Borthwick, A. (1965) **Yarrow and Company Limited: The First Hundred Years, 1865-1965**, Glasgow, Yarrow and Company Limited.

Breheny, M.J. (1988) 'Contracts and contacts: defence procurement and local economic development in Britain', in Breheny, M.J., (ed) **Defence Expenditure and Regional Development**, London, Mansell Publishing Ltd., (188-211).

Brown, D.K. (1983). **A Century of Naval Construction: the History of the Royal Corps of Naval Constructors, 1883-1983**, London: Conway Maritime Press.

Business Strategies Ltd and Janes Consultancy Services (1992). **Defence in Scotland**, London: BSL.

Cmnd. 7125 (1947) **Industry and Employment in Scotland**, London, HMSO.

Dabinett, G. (1993) 'Crisis in defence: the role of local authorities', **Edinburgh Economic & Employment Review**, 3. 8, (15-16).

Dabinett, G. (1994) 'Markets and the state and the role of local regeneration strategies: a case study of the defence sector in the UK in the 1980s', **Local Economy**, 8, 4, (338-351).

Dalyell, T. (1977) **Devolution: the End of Britain?**, London, Jonathan Cape.

Edgerton, D. (1991) 'Liberal militarism and the British state', **New Left Review**, 185, (138-169).

Edgerton, D. (1995) 'Public ownership and the British arms industry 1920-50', in Millward, R. and Singleton, J. (eds) **The Political Economy of Nationalisation in Britain 1920-50**, Cambridge, Cambridge University Press, (164-188).

ELDDI (1993) **Edinburgh and Lothian Defence Diversification Initiative**, Edinburgh, Lothian Regional Council and Edinburgh District Council.

Erickson, J. (1969) 'Scotland's commitment; some problems of cost, capability and effectiveness', in Wolfe, J.N. (ed) **Government and Nationalism in Scotland**, Edinburgh, Edinburgh University Press (71-87).

Ferranti (1993) **Ferranti: 50 Years In Scotland**, Edinburgh, GEC Marconi Avionics Limited, Support Division.

Fife Regional Council (1993) **Rosyth: Business Impact**, A Report Prepared by Fife Regional Council, mimeo.

Fife Regional Council and Fife Enterprise (1991) **A Study of the Fife Defence Industry**, Glenrothes, FRC.

Firn, J.R. and Roberts, D. (1984) 'High technology industries', in Hood, N. and Young, S. (eds) **Industry, Policy and the Scottish Economy**, Edinburgh, Edinburgh University Press.

Harvie, C. (1981) 'Labour and Scottish Government: The age of Tom Johnston', **The Bulletin of Scottish Politics**, 1, 2 (1-20).

Hilditch, P. J. (1990) 'Procurement and employment: the case of UK shipbuilding', **Cambridge Journal of Economics**, 14, (483-496).

Hornby, W (1958) **Factories and Plant**, London, HMSO.

Hudson, R. and Sadler, D. (1986) 'Contesting works closures in Western Europe's old industrial regions: defending place or betraying class?', in Scott, A.J. and Storper, M. (eds) **Production, Work, Territory: The Geographical Anatomy of Industrial Capitalism**, Winchester, Mass., Allen & Unwin, (172-193).

Hume, J. R. and Moss, M. S. (1979) **Beardmore: The History of a Scottish Industrial Giant**, London

Kennedy, P. (1988) **The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000**, London, Unwin Hyman.

Kennedy, P. (1991). **The Rise and Fall of British Naval Mastery**, London: Fontana Press (third edition.

Kohan, C. M. (1952) **Works and Buildings**, London, HMSO and Longmans, Green and Co.

Lorenz, E. H. (1991) **Economic Decline in Britain: The Shipbuilding Industry, 1890-1970**, Oxford, Clarendon Press.

Lovering, J. (1985) 'Regional intervention, defence industries and the structuring of space in Britain; the case of Bristol and South Wales', **Environment and Planning D: Society and Space**, 5, (283-302).

Lovering, J. (1988) 'Islands of prosperity: the spatial impact of high-technology industry in Britain', in Breheny, M. J. (ed.), (29-48).

Lovering, J. (1989) 'Diversification policies in defence-dependent local economies: current British experience', **Local Economy**, 14.2, (113-124).

Lovering, J. (1990) 'Military expenditure and the restructuring of capitalism: the military industry in Britain', **Cambridge Journal Of Economics**, 14, (453-467)

Lovering, J. (1991) 'The changing geography of the military-industry in Britain', **Regional Studies**, 25.4, (279-293).

Lovering, J. (1995) 'Opportunity or crisis? The remaking of the British arms industry', in Turner, R. (ed.) **From the Old to the New: The British Economy in Transition**, London, Routledge, (forthcoming).

McCrone, D. (1993) 'Regionalism and constitutional change in Scotland', **Regional Studies**, 27.6, (507-512).

McNeill, W.H. (1983). The Pursuit of Power: Technology, Armed Force and Society since AD1000, Oxford: Blackwell.

More, C. (1982) 'Armaments and profits: the case of Fairfields', **Business History**, 24, 2, (175-185).

Moss, MS and Hume, JR (1977) **Workshop of the British Empire: Engineering and Shipbuilding in the West of Scotland**, London and Edinburgh, Heinemann.

Peebles, H.B. (1987) **Warshipbuilding on the Clyde: Naval Orders and the Prosperity of the Clyde Shipbuilding Industry, 1889-1939**, Edinburgh, John Donald.

Pollard, S. and Robertson, P. (1979) **The British Shipbuilding Industry, 1870-1914**, Cambridge, Mass., Harvard University Press.

Reader, W. J. (1971) **The Weir Group: A Centenary History**, London, Weidenfield and Nicolson.

Robertson, A. (1986) **Lion Rampant and Winged**, Barassie, Privately published.

Sampson, A. (1977) **The Arms Bazaar**, London, Hodder and Stoughton Ltd.

Scottish Enterprise (1992) **The Scottish Defence Initiative**, Glasgow, Scottish Enterprise

Sen, G. (1984) **The Military Origins of Industrialisation and International Trade Rivalry**, London, Pinter.

Smith, R.P. (1990) 'Defence procurement and industrial structure in the UK', **International Journal of Industrial Organisation**, 8, (185-205).

Spaven, M. (1983) **Fortress Scotland: A Guide to the Military Presence**, London, Pluto Press.

Stewart, J.C. (1993) **The Sea Our Heritage**, Keith, Banffshire, Rowan Books.

Todd, D. (1981) 'Regional variations in naval construction: the British experience, 1895-1966', **Regional Studies**, 15.2, (123-142).

Todd, D. (1988) **Defence Industries: A Global Perspective**, London, Routledge.

Trebilcock, C. (1977) **The Vickers Brothers: Armaments and Enterprise, 1854-1914**, London, Europa.

Ward, S. V. (1988) **The Geography of Interwar Britain: The State and Uneven Development**, London, Routledge.

June 1995